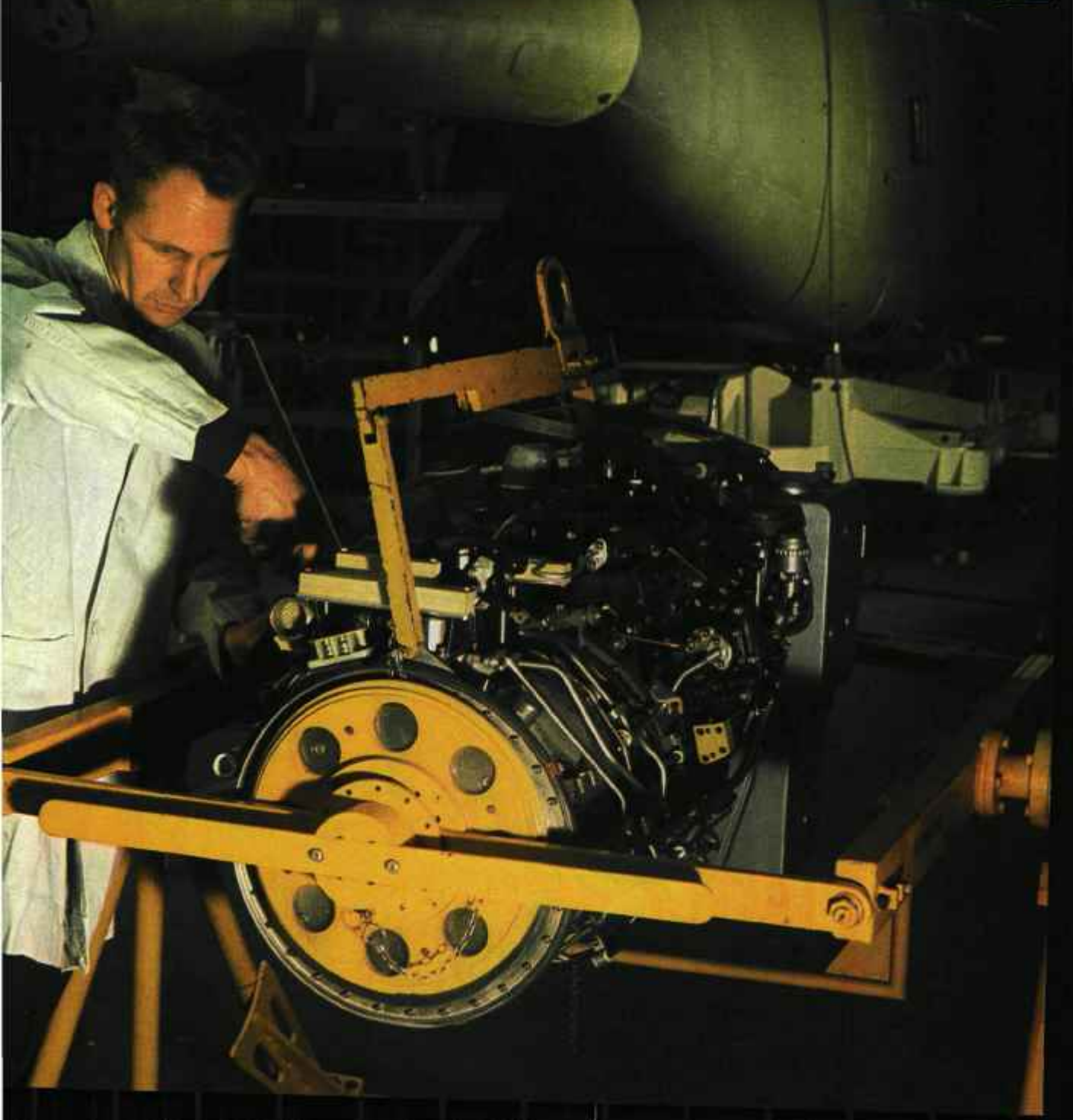


World Helicopter Market

FLIGHT

INTERNATIONAL



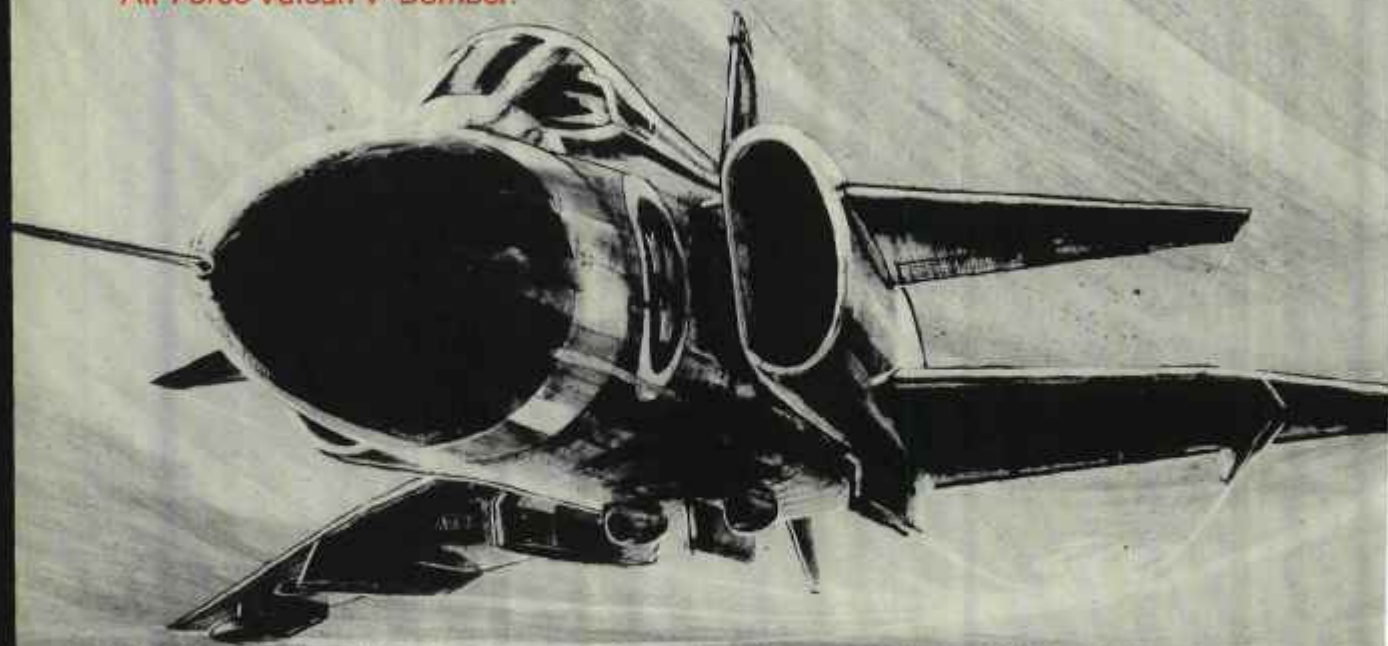
Decca Doppler navigates The Viggen

Decca Doppler Type 72 has been chosen for Viggen Aircraft of the Swedish Air Force.

In a contract recently awarded by the Swedish Air Material Department Decca Doppler Type 72 equipment to the value of £1,000,000 has been ordered for these supersonic combat aircraft.

Decca Doppler Type 72 is a solid-state single unit equipment currently achieving in service a reliability of 1000 hours Mean Time between Failures. As it is a single unit, complete with radome, the problem of aircraft installation is greatly simplified. Doppler Type 72 has a built-in test system which is designed to reduce servicing effort to a minimum. The maximum repair time per unit is forty minutes.

Over 250 sets of Type 72 doppler have been sold for aircraft including the French Air Force Jaguar and the British Royal Air Force Vulcan V-Bomber.



TOP
DOPPLER

The Decca Navigator Company Limited London

Future of the independents

Hopes of an early solution to the vintage corporations v. independents controversy were hardly raised by Mr Noble's statement in the House of Commons. For BUA, three years after the setting up of the Edwards Committee, the situation is becoming intolerable. The owners must just want to sell the airline to BOAC, and the sooner the better.

In some ways it is a pity that so much attention has been given to contriving a forced marriage between BUA and Caledonian. Caledonian did not exist ten years ago; it has not become Britain's biggest independent (see page 150) by Government-imposed mergers. As in every business, success follows the efficient supply of consumer demand. Mergers are no use, and money is not forthcoming, if the market opportunity is not there. This is the starting point, BUA have always said "give us routes first." As the chairman of the US Civil Aeronautics Board recently said, nobody in Government is smart enough to propose mergers.

Unfortunately, handing over BOAC or BEA routes to private airlines is not practical politics for any Government, Labour or Conservative. Nor indeed is there any proper way in which the Government, unless it changed the law and provided massive compensation from public funds, could give BOAC and BEA spoils to private enterprise.

If the Government cannot create the markets it can create the market opportunities. Of course there is plenty of "candyfloss" business, expanding year by year as air transport makes Majorca as attainable as Margate. But as the big national scheduled airlines increasingly go after this holiday trade it becomes

an increasingly uncertain business for the independents. (BUA last year lost a £1½ million holiday charter contract overnight to BEA's new specialist holiday subsidiary, BEA Airtours). In any case air transport has a greater purpose than holidaymaking. Its primary duty is to provide scheduled services.

The corporations v. independents controversy has been raging on and off since the 'thirties, when Imperial Airways did not serve Europe adequately. What is the answer? The Government very nearly found it in 1960 when the Civil Aviation Licensing Act gave the independents the right to apply to operate scheduled services in competition with the corporations. This was a market opportunity; and it led directly to the formation of BUA—an amalgamation of Airwork, Hunting-Clan, Transair, Air Charter, Mortons, Olley and other independents. But the 1960 Act, though promising in theory, was defective in practice. The small print effectively ensured that the Government—i.e., the owners of BOAC and BEA—was the real licensing authority. Because of the one-a-year turnover in civil aviation ministers, power has in practice been in the hands of civil servants, and inevitably the steering has always been biased towards the corporations.

A re-reading of the 1960 Act and the associated regulations prompts the thought that only a few legislatively minor modifications are needed to create a market opportunity for the independents. Make the Air Transport Licensing Board a truly independent route licensing authority, with a membership of not more than five well chosen experts and a really professional staff; delegate to them the Government's

responsibility for international fares; give them more initiative in international traffic rights and in the supervision of foreign carriers; nourish the whole industry with a really rich flow of published financial and traffic data; and let the licensing authority get on with it. Forget for the moment the all-embracing Civil Aviation Authority and joint BOAC/BEA Airways Board; the necessary legislation could not be got through for two years anyway. The very creation of a professional, independent route-licensing authority would in itself induce the confidence and attract the investment which the independents urgently need—BUA desperately so.

IN THIS ISSUE

World News	146
Air Transport	149
Light Commercial	155
Private Flying	156
A Century of service	158
Design for combat	160
Defence	163
World Helicopter market	165
Letters	183
Spaceflight	184
Straight and Level	184a

Front cover, the Rolls-Royce Small Engine Division BS.360 turbine engine for the Westland-Snias WG.13 helicopter being prepared for installation in a test rig at Yeovil. The BS.360 is a new engine designed specially for this utility helicopter, a test structure of which is seen in the background



WORLD NEWS

MRCA goes ahead

Last week, on July 22, the Governments of Britain and West Germany signed the Memorandum of Understanding to launch the development of MRCA, the multi-role combat aircraft. The third country, Italy, is deeply involved in a government crisis and is at present unable to define its position.

MRCA is the most significant military aircraft programme in existence outside America and Russia. Involving potentially nearly 1,000 aeroplanes, it is also currently Europe's largest aviation programme. Announcing the news to the House of Lords on July 22, Lord Carrington, the Secretary of State for Defence, said:—

"As the House knows, the Governments of the United Kingdom, the Federal Republic of Germany and Italy agreed last year to enter upon the Project Definition phase of this project. The results of that phase and subsequent discussions between the partners confirmed the feasibility of developing a twin-seat multi-role variable-geometry aircraft which would meet the requirements of all three countries.

"On coming into office, we reviewed this project and concluded that it offered the most effective and economical means of meeting the requirements of the Royal Air Force for replacement aircraft in the strike, reconnaissance and air-defence roles in the later 1970s and 1980s. We also recognised

that the project offered an opportunity for a European collaborative venture of the greatest technical and industrial importance.

"We have accordingly made arrangements with our German partners to begin work on the first major development phase of the aircraft. This phase is designed to lead to the flight of the first prototype and will last about three and a half years. A thorough review of progress will be made at the end of one year in the light of the more refined assessments of cost, time-scale and performance which will then be available.

"The Government of Italy is, in present circumstances, not immediately able to subscribe to these arrangements but is expected to reach a final decision within the next few weeks. Should the Government of Italy decide not to continue, we have agreed with the Germans to proceed bilaterally. On the assumption that Italy decides to continue, as we hope, expected total requirements of aircraft for all three countries would be about 900, of which our requirement is planned to be between 350 and 400. The costs of the total programme are to be shared according to the relative numbers of aircraft. The estimated cost of the first phase of development, on which we have now agreed, is of the order of £250 million of which the United Kingdom share would be somewhat less than half."

For Britain it will be the first Mach 2-plus aeroplane to reach the development stage since the TSR.2 of some 11 years ago. For Germany and Italy it will be the first-ever "home-grown"

aeroplane of this performance. Metal-cutting will begin early next year.

The signing of the Memorandum will now pave the way directly for the letting of the many industrial contracts in respect of the airframe, engine and avionics. The airframe will be built by the joint industrial firm Panavia which, comprising elements of British Aircraft Corporation, Messerschmitt-Bölkow-Blohm and Fiat, will be responsible overall for the development (and later production) of the aeroplane and its systems with the exception of the engine. The powerplant will be developed by another joint industrial organisation, Turbo-Union, comprising Rolls-Royce, MAN-Turbo in Germany, and Fiat. Because of the importance and complexity of the engine programme, Turbo-Union will be directly responsible to the three-Government MRCA management organisation.

Although Italy did not sign the MoU, she has been allowed a two-month period in which to decide whether or not to join the programme. The Italian Government has voted to finance its country's development work during that period, so that if she decides to come in with the other two partners no time will have been lost. Italy has intimated that, like Germany, she would accept the two-seat version of the aeroplane with the "British" nav/weapons system, so that the cost of the MRCA flight development programme will be virtually the same irrespective of whether she joins or not. The Italian contribution would be the purchase of 100 aeroplanes and industrial work-sharing equivalent to the comparison which this figure bears to the total quantity of aeroplanes built for the three countries.

The first development phase, to which the two Governments are now committed, will take the programme up to the first flight date during the autumn of 1973. The three Governments have committed £250 million up to this date, which represents the next significant "plateau." The money is not, therefore, allocated on a yearly basis, but safe-

Galaxy in Suffolk First Lockheed C-5A Galaxy to visit Britain, 880214, of the USAF, coming in over the Lakenheath approach lights (left). See news story on opposite page

Taxiing already First picture of the McDonnell Douglas DC-10 (facing page), officially rolled out at Long Beach, California, on July 23. The aircraft taxied under its own power (some taxi tests had already been conducted) with project pilot Mr Cliff Stout in command



guards in the form of periodic reviews will ensure that the programme is kept "on the rails."

At the present time there are no specific commitments in respect of the number of aeroplanes which will be bought by each country. The requirement as understood at present is for 385 aeroplanes for Britain and 420 for Germany, together with a further 100 for Italy, making a total of 905. There will be seven prototypes.

There is, however, a strong possibility that the German requirement may drop to as low as 220 aeroplanes, owing to the purchase of extra Phantoms and launching of the Franco-German strike-trainer (see below). This would clearly affect the distribution of responsibility as defined by the principle of work sharing. Any such change of requirement on the part of one of the members would be accompanied by the payment of compensation to the other partners.

The total cost of development is still estimated at about £470 million (see *Flight*, April 23, 1970). Series production of the aircraft will not be authorised until an agreed number of flying hours has been accumulated with the first prototype; this will be probably during early 1974. This, again, is a measure to ensure that money is committed at as low a risk level as possible commensurate with the need to place orders for long-lead items to meet the service introduction date.

It is now expected that MRCA will have been cleared for service (at, probably, an "interim operational standard") during 1977, although by that time some half-dozen pre-series aeroplanes will be available to the three countries to provide initial service experience.

Alpha-Jet goes ahead

On July 25 France and Germany announced the Dornier-Dassault Alpha-Jet as winner of the two countries' design competition for a twin-engined strike-trainer aircraft. A French engine, the Larzac, will be built jointly by Snecma and Turbomeca.

The Alpha-Jet had one serious competitor, the Eurotrainer, proposed by Messerschmitt-Bölkow-Blohm and Sniac. A purely national project by VFW (exhibited in model form at the Hanover show earlier this year) was widely regarded as a non-starter since there was no French partner. It may be no coin-

SENSOR

Lockheed's present order book is sufficient to occupy the production lines for a minimum of two years with production of both Hercules and Galaxy being likely to end during 1973.

The United States Navy has indicated an interest in a flying-boat version of the Lockheed C-5A. Apart from hull design development work would include overwing engine pods.

Dassault expect to sell only 80 Mercuries by the end of 1978.

The first Aerostar twin to be produced by new owners Butler Aviation is expected to be completed by October. Production will rise to five a month by the end of this year and to ten a month by the middle of 1971.

One of the major misunderstandings in the controversy over the future of the independents is the belief that the Edwards Committee favoured the transfer of BOAC's African routes to BUA. It recommended only "limited concessions" of corporation routes. Though these were never spelt out in the report, what the Committee in fact

had in mind was that the remaining BOAC points in South America should be given to BUA to complete their South American route network taken over from a willing BOAC in 1964. Together with some transit rights in the Caribbean, and parallel North Atlantic competition, this would give the Second Force the base it needed.

BEA Airtours is considering buying Boeing 720s from Aer Lingus-Irish for use on services next year because of the popularity of the charter subsidiary's services.

Major changes in the IATA traffic-conference procedures are expected to be considered at the forthcoming Honolulu conference.

There are now doubts whether the Edwards Committee would have recommended a joint BOAC/BEA Airways Board if it had thought that the Second Force was a non-starter.

Participation by the Industrial Reorganisation Corporation in the formation of the proposed second-force airline has now been put on ice. A substantial financial involvement was at one time considered, but the IRC is itself facing future uncertainties for political reasons.

cidence that the decision was announced only one day after Britain and Germany had committed themselves to MRCA development. The latter programme will provide a major task for Messerschmitt-Bölkow-Blohm while (in the French industry) the Breguet-Dassault organisation needs a project for its design office.

Each country will buy 200 aeroplanes. The first prototype will fly in 1972 and deliveries of production aircraft will begin during 1975.

Lakenheath Galaxy

At 0757Z last Sunday, July 26, the 28 wheels of a Lockheed C-5A Galaxy touched down on an English runway for the first time at the USAF base at Lakenheath, Suffolk. The aircraft flew in from Frankfurt carrying a representative load of cargo pallets; revealed when the massive nose cone was raised after shut-down.

In the air the C-5A belies its 762,800lb (346,000kg) all-up weight, being well

proportioned and not unusually noisy at the power settings used for two low passes before landing. The choice of Lakenheath for its UK arrival was dictated by runway repairs at the USAF terminal at Mildenhall.

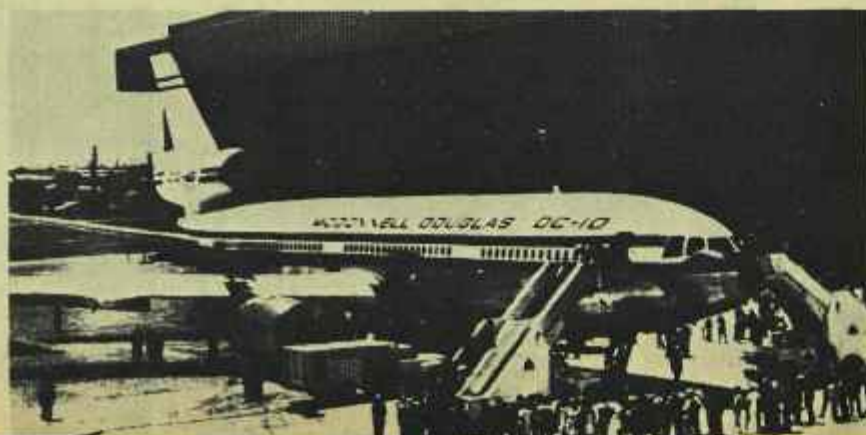
Aerobatics Results

Bad weather prevented thirteen of the finalists in the world aerobatic championships from flying their fourth and last sequences. As a result the positions were taken from the combined totals of the three preliminary rounds. Igor Egorov was declared world champion, with Bob Herendeen, USA, second and Arnold Wagner, Switzerland, third. Finals started on the Wednesday but low cloud and above-limit winds prevented any further flying. (See also page 156).

Conway Disc Change

The ARB council recommended on July 23 that modifications to Rolls-Royce Conway compressor discs be made mandatory. This followed the June 22 eighth-stage compressor disc failure first reported in *Flight* on July 23, page 104. The previous (purely advisory) ARB pronouncement on the subject recommended that strengthened discs be fitted, or that zero-life old-pattern discs, inspected to a higher standard, be substituted. The third alternative was for the airlines to remove used components, inspect them to the higher standard and replace them if possible.

This last alternative has now been rejected and Rolls-Royce should by now have put out a mandatory service bulletin requiring the new, strengthened or old-pattern zero-life high-tolerance



WORLD NEWS...

discs to be fitted as soon as practicable. Grounding of Conway-powered aircraft was rejected by the ARB.

The modification work on the 500 or so Conways in worldwide service should be completed by the spring of 1971. BOAC should have all its engines modified to the new specification by October 27; 72 engines for the 18-strong 707-436 fleet have already been refitted.

Balpa is concerned about the disc failures but is being kept informed of the situation by BOAC.

Aid for Lockheed

With Lockheed in an acute liquidity crisis, the plan by the Pentagon and a 24-bank syndicate headed by the Bankers Trust Co of New York to provide \$430 million (£179 million) has come as welcome respite for the United States' largest defence contractor. But the main problem is to ensure the continued development of the TriStar, the company's only serious means of breaking away from military project work, the management of which has contributed to the present situation.

The four-element plan depends entirely on its first part: Congressional approval for a \$200 million (£83.5 million) "contingency fund" to cover cost

overruns on the C-5A military transport. The Pentagon then needs to approve a \$100 million (£41.7 million) "V" loan of the type dispensed to keep strategic services going. Congressional approval is not necessary for this.

The banks would then approve a further loan of \$80 million (£33.2 million). This is the remainder of a \$400 million (£167 million) credit, of which \$320 million (£133 million) has already been drawn, and which would normally have been retained by the banks. Fourth element of the plan would be for \$50 million (£20.8 million) to be contributed in additional advanced payments by the customer airlines which have placed options on TriStars.

Rolls-Royce and the RB.211

In referring to the company's financial results for 1969 and to its major project, the RB.211, the chairman of Rolls-Royce, Sir Denning Pearson, said at the annual general meeting in Derby on July 21:—

"It is profoundly disappointing to your directors to have had to present to you the results contained in the accounts for 1969, which have had such a serious effect on the income of shareholders and the value of their holdings.

"The business as a whole is in good shape, as I told you in my statement, but our basic problem is that of having to invest very large sums of money in the development, tooling and launching of the RB.211.

"To give you some idea of the increase in scale of the RB.211 over previous engines and the rate of change, the first Dart engine was sold for £7,000 and powered the Viscount, which was the first propeller turbine-powered airliner in the world.

"That was 17 years ago and I am glad to say that not only is the Viscount still in service, but we are continuing to manufacture and sell new Dart engines today.

"The original selling price of the Spey was £65,000 and RB.211 for the Lockheed TriStar will sell initially at over £250,000.

"As the cost of developing civil aero-engines varies roughly with the price you will see why it is quite impossible to finance the cost of development of the RB.211 out of current sales of existing engines.

"However, in order to stay in the civil aero-engine business and continue to make use of our fixed assets, many of which, such as our high-altitude plant, are of no use for anything else, we must respond to the competitive situation and bring out new models from time to time to match those of our competitors.

"Such a situation existed with the projecting of the new generation of large wide-bodied subsonic transport aircraft. Our response to this situation was the RB.211, which is probably the most

advanced concept for a large civil aero-engine. This is one of the reasons why Lockheed and their airline customers chose our engine.

"Such an advance in technology carries proportionate risks and some of these advances, such as carbon fibre fan blades, have proved to be a more expensive development and to need more time than was anticipated, with the result that we shall have to use titanium blades initially. These will increase the weight and cost.

"Nevertheless, we have in the RB.211 and its normal development an engine which will in the long term maintain both the company's reputation and its main business as a supplier of major civil aero engines.

"Furthermore, this new breed of large civil engines which at the present time are only capable of being developed by three companies in the western world—General Electric, Pratt & Whitney and Rolls-Royce—are likely to be in production into the next decade, partly because we may have reached a plateau in the development of gas turbine technology, as happened in steam turbine technology, and partly because of the immense cost of developing a brand new model.

"In this situation the company cannot afford to be left out. Nevertheless, important though the RB.211 is, it represents only 13 per cent of projected turnover over the next five years.

"We are unfortunately not unique in finding that the development of these advanced technological products turns out to be more difficult than was originally estimated. On top of this, we are beset with costs of all kinds that are rising at a much more rapid rate than could have been foreseen at the time we entered into commitments on this engine.

"The arrangement with the Government for 70 per cent participation was in fact 70 per cent of the original estimated costs, leaving us to carry not only the increased costs arising from changes

in the engine requirements to meet the developing competitive situation, but also all of the excess escalation of wages, salaries and other costs. Nevertheless, we cannot emphasise too often that the success of our business depends on maintaining the confidence of our customers through our technical reputation.

"I can assure shareholders that all financial and cost control talent that can usefully be deployed is being deployed on the RB.211 to see that the engineers' task is being carried out as economically as possible."

Speaking of relations with the new Government on further developments of the RB.211, Sir Denning said:—

"I told you in my statement that the Government were aware of our difficulties in financing further development of the RB.211 in the short term. Since I wrote that we have had a change of Government.

"We have lost no time in approaching the new Government and emphasising to the Minister of Technology himself the urgency of our need to remove the uncertainty surrounding the Government attitude towards further developments of the RB.211.

"Although we were sympathetically received, we have had no positive answer.

"Apart from the specific issue of the RB.211 further development, we shall continue to use all possible means available to us to urge on the Government to define their policy towards the support of our aero-engine research and development in general on a scale to enable us to continue to compete with our American competitors, who enjoy such massive support from their own Government."

Sir Denning added that "due to a recent change in the customers' requirements, for which we will be compensated in due course, the estimate of that part of the RB.211 launching costs to be charged against this year's profits has increased."



AIR TRANSPORT

The elusive merger

NERVES WERE GETTING A LITTLE FRAYED last week in the BUA affair. A Board of Trade statement in Parliament was widely expected, but did not materialise; reports in the daily Press—no guesses where the leak came from—said that BOAC had been approached by the Government on the sensitive topic of the transfer of routes to a second-force airline, but that it was not prepared to play; and Caledonian Airways reported no change in the situation during the last few weeks—the airline's position remains that it cannot make a bid to buy BUA until the Government has promised a worthwhile future for a second-force airline. The owners of BUA, British & Commonwealth Shipping, were keeping quiet, but must be becoming increasingly anxious as the weeks and months slip by.

Since March 18, the day when the former President of the BoT, Mr Roy Mason, blocked for the time being BOAC's proposed purchase of BUA, there has been remarkably little outward change in the situation. Mr Mason reversed his earlier decision—to allow the purchase in principle—when he found out that there was a real chance of BUA and Caledonian coming together to form the second-force airline envisaged by the Edwards Committee. A long period of negotiation between B&C and Caledonian ensued, during which the latter obtained—after some delay—the information which it said it needed to formulate a bid for BUA.

But, as Caledonian has said, its shareholders (mainly Great Universal Stores and a number of banking interests) could not be expected to finance a bid until they had had some statement of the Government's intentions. Caledonian—unlike BUA—has never demanded the transfer of any of the corporations' routes in order to make a second-force airline viable, but nevertheless clearly needs such Government assurances.

Much of the delay has of course been due to the change of Government in June. The outgoing Government had rejected the idea of any significant transfer of corporation routes to the independent sector. The new Government has been sounding out BOAC (the corporation most affected) on the matter, and has been met with a firm refusal to part with any routes at all except under compulsion. Whether the BoT could exert such compulsion under existing legislation is doubtful, and if it did

it would be met with strong opposition, not only from BOAC, which has no intention of yielding commercial assets to a competitor, but also from the unions.

A BoT spokesman declined to comment last week on whether approaches about route transfers had been made to BOAC. In Parliament Mr Michael Noble, BoT President, said that no statement could be made before the recess (which has now begun) but added that decisions on "commercial issues" would if necessary be taken during the recess. He agreed that no transfer of routes could take place before Parliament had been competitor, but also from the unions.

In fact the Government's approach to the two corporations is likely to have been in the most general terms and aimed at determining how, in the present situation, the interests of British air transport as a whole can best be served. It is this, rather than the question of the relative merits of corporations and independents, that is the crucial issue. But any approach was bound to touch the corporations on a sensitive spot.

There is little doubt that BUA as an airline has been placed in a very awkward situation by the protracted uncertainties. It has been faced with the need to continue normal operations when all the world knows that it is up for sale, and the maintenance of staff morale will not have been the least of its problems. There is furthermore the possibility that its value as a commodity will have depreciated during the waiting period—a factor which will not have been lost either to Caledonian or to BOAC (which is still interested in buying the airline).

B&C remains anxious to sell BUA; in fact there is little doubt that even if the worst came to the worst (and there is no suggestion that it will) and the airline was closed down and its assets sold off, B&C would not be out of pocket on its original purchase price for the company.

Concorde 002 seen as engine tests with Olympus 593-38s began at Fairford recently. Another picture: page 152



AIR TRANSPORT...

CALEDONIAN LEADING INDEPENDENT?

ON the best single measure of size—output in capacity short ton-miles—Caledonian Airways is now almost certainly the largest British independent airline. Board of Trade figures just released show that the airline's output in the first quarter of this year rose to just over 41 million CTM, narrowly overtaking the traditional leader, British United (just under 40 million CTM).

The Caledonian lead will probably increase further during the summer months, and there is a fair chance that it will supplant BUA as the leading independent in the course of this year. Together Caledonian and BUA account for almost exactly half of the total output of all the independents, who in turn account for over 20 per cent of the total British effort; BOAC accounts for about 60 per cent and BEA for a little under 20 per cent. The figures for the first quarter of 1970 (capacity short ton-miles \times 1 million) are:—

	Scheduled	Non-scheduled	Total
BOAC	465	—	465
BEA	125	8	133
BUA	25	15	40
Caledonian	—	41	41
Other independents	12	74	86
Independent total	37	130	167
National total	627	138	765

GET-TOUGH CALL

REPRESENTATIVES of 30,000 US airline pilots meeting in San Francisco for their annual Air Safety Forum last week ignored the soft line on hijacking propounded at the Ifalpa conference in London earlier this year.

Captain Grady B. Stone of Eastern Airlines and chairman of Alpa's hijacking committee said: "International civil aviation is threatened unless something is done about hijacking and sabotage." The pilots called for bullet-proof cockpits, better protection devices and tougher prosecution.

Public confidence in air transport had been eroded by at least 205 hijacking attempts since 1930, 155 of which had been successful, said Captain Stone. Some 210 persons had died in six US crashes classified as sabotage since 1955. Hijacking had accounted for one death.

Neither airlines nor governments had acted decisively to develop legal and technical deterrents to air pirates, he added.

CAB PREPARES TO HIT BACK

FURTHER powers to regulate the activities of foreign scheduled airlines operating into the USA are being sought by the Civil Aeronautics Board. The board has proposed a regulation which would enable it to make such airlines file requests for permission to operate on-route charters. All off-route charters are already subject to prior approval, as are those by foreign non-scheduled airlines, should the CAB so require.

The board's action follows an earlier regulation, approved by the US President, Mr Nixon, in June, conferring powers to predetermine the frequency of service offered by foreign airlines. As the CAB stressed at that time, the measure was taken to "combat foreign governmental restrictionism" and to provide the opportunity of taking retaliatory action against such attitudes.

The new regulation is directed towards the same end, and the CAB points out that it represents powers no greater than those already exercised by many foreign governments. "To an increasing extent," says the board, "some governments have been exercising their powers in a manner which sharply restricts the charter operations of US carriers. Indeed, some States are acting in concert to impose restrictions which would severely limit the availability of charters to the public; and other States have imposed an outright ban on various charters of certain US carriers." As with the earlier regulation, possession of an effective deterrent is the main motive. The CAB says that it will be "a regulatory device appropriate to

the requirements of the rapidly developing charter market, and responsive to CAB determinations based on the principles of comity and reciprocity."

The US supplemental airlines are not mentioned specifically by the board; but their right to a share of the air transport market was reaffirmed in the recent restatement of US policy (reported in *Flight* for July 2, page 7): "Scheduled and chartered services are of vital importance. . . . Both scheduled and supplemental carriers should be permitted fair opportunity to compete in the bulk transportation market." It is the supplemental airlines who have been meeting restrictive government attitudes towards charters, notably in Europe. Such attitudes generally stem from the desire to protect a national scheduled carrier; and it is against such carriers that the CAB is now taking more powers for retaliation.

The National Air Carrier Association, which represents the supplemental airlines, issued a statement welcoming "this implementation of the President's new international air transport policy." Naca said that the regulation would provide a long-needed economic tool "to counter the artificial restrictions being imposed on low-cost charters."

UNITED IN THE RED

A NET loss of \$20.7 million (£8.3 million) in the first half of the year has been reported by United Air Lines. The figure compares with a \$16.5 million (£6.9 million) profit in the equivalent period last year. The president of the airline, Mr George Keck, said that United (which is predominantly a domestic carrier) needed an interim rise in US domestic fares even before the CAB completed its current investigation on the subject, and would apply to the board accordingly.

Mr Keck attributed the loss to a general deterioration in the economic situation in the USA, additional competition following recent route awards to other airlines, air traffic co-control problems and rising costs. The way in which the airline's operating costs have outstripped revenue has been marked: costs rose 13.2 per cent in the half-year compared with the first half of 1969, while revenue rose only 1.8 per cent. There was a 7.4 per cent fall in the number of passengers carried, but freight carried rose by 17.8 per cent.

● American Airlines reported a net loss of \$1.7 million (£710,000) for the first half of this year.

Two Fokker F.28s have been ordered by a new West German charter operator, Aviation-Hanseatische Luftreederei GmbH of Hamburg. They are due for delivery next year.

Dan-Air Recommended A CAB examiner has recommended that Dan-Air be granted a foreign air-carrier permit for operations into and out of the USA. His finding has yet to be approved by the CAB and the White House.

All Nippon Re-order? All Nippon is planning to buy eight 727s and three 737s next year, according to reports from Japan. The airline at present has 15 727s (eight leased from Pacific Southwest) and six 737s, with four 737s already on order.

Eastern Improvement Net profit returned by Eastern Airlines in the first half of this year was \$16.9 million (£7 million), compared with only \$2.4 million (£1 million) in the same period last year. The airline's chief financial officer, Mr Charles J. Simons, said that improved earnings, although still low, reflected the effectiveness of very strong cost-control and market-development programmes.

No Ships for ONA Overseas National Airways has sold its 50 per cent interest in two cruise liners under construction to Cunard Steamship Co, the airline has said. ONA added that the decision was taken because of the present economic situation, but that its faith in the future of air-sea holiday travel was undiminished. The investment funds recovered from the sale, ONA's president, Mr Steedman Hinckley, said, have "substantially solved what was developing into a liquidity problem for ONA."



In an astute move Lockheed staged a dedication ceremony for its new Palmdale factory a couple of days before its competitor McDonnell Douglas was due to roll out the DC-10. Dominating the ceremony was the TriStar, spick and span and looking (right) as if it, too, were ready to roll out. Appearing justifiably pleased were (left to right) Daniel J. Houghton, board chairman, Charles S. Wagner, president, and William M. Moran, executive vice-president commercial programmes. In the larger picture the TriStar, with engines installed, is ready for its actual roll-out, scheduled for September 1. First flight is due in November.

CONCORDE: FIRE WITHOUT SMOKE

A DECISION by BAC and Rolls-Royce on whether they will use smoke reduction additives in the Olympus 593-3B engines of the prototype Concorde has yet to be taken. The tanks which would be necessary if such a system were to be fitted have not been installed in either prototype.

Production engines—Olympus 593 Mk 602s—will be fitted with annular combustion chambers and lightweight vapourising fuel systems. These items, both of which are being developed from Pegasus experience, should ensure that production Concorde smoke levels are acceptable. As a back-up, Rolls-Royce Bristol and Snecma are working on a 593 Mk 601 engine, using can-annular combustion chambers and high-pressure spray nozzles of the type now used in the engines fitted to the prototypes. If this standard of engine had to be adopted for production aircraft (and at the moment it seems unlikely) then a smoke problem might occur. In that case fuel additives, probably ethyl-based, might be used, but no discussions with the ARB have taken place on this subject.

INDEPENDENCE FOR BUIA

AS part of a move to separate it completely from the British United group, British United Island Airways has been renamed British Island Airways. Ownership of the airline is unchanged—it remains a wholly owned subsidiary of BUA (Holdings), which is in turn owned 90.8 per cent by British & Commonwealth Shipping and 9.2 per cent by Eagle Star Insurance.

The separation of the company will be underlined by the adoption shortly of a new livery for the fleet, replacing the present one which is very similar to that of BUA. BUIA was never included in the B & C plans for disposing of BUA, and in May and June its administration moved from Gatwick to new offices at Redhill, Surrey.



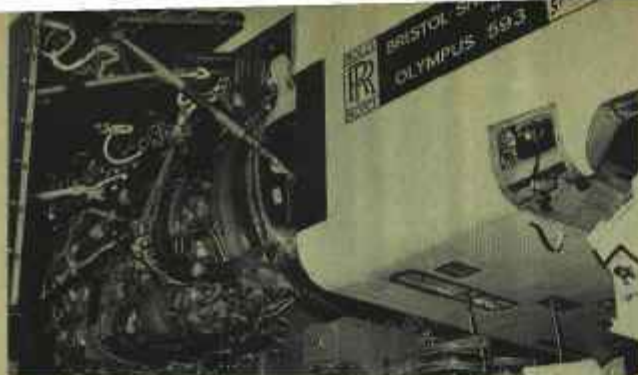
BUIA was formed in 1968 by a merger of BUA (CI), British United (Manx) Airways and Morton Air Services. The Hon Anthony Cayzer remains chairman of the airline, and Mr L. B. Elwin is to continue as general manager. Mr Alan Britton will no longer be managing director, but remains on the board of the airline. The other BIA board members are: Mr A. E. Lemon, Mr N. Mountain, Major J. R. Riley and Mr J. A. Thomson. The company secretary is Mr G. A. Adkin.

BALPA'S BLACKLIST

ON July 18 Balpa published a list of the major airfields in Europe which are considered by the association's pilots to have deficiencies in their approach and landing aids. Four airfields, Alghero, Gerona, Nicosia and Palermo are considered to be dangerous in bad weather, and a further nine are to be studied by a Balpa working group newly set up for the purpose. These nine airfields, which have been the subjects of complaints to the union by pilots, are Alicante, Catania, Gibraltar, Faro, Ibiza, Innsbruck, Malaga, Rhodes and Turnhouse.

Balpa's complaint regarding the four "dangerous" airfields is, in each case, that the site lies in mountainous terrain and that the approach and/or landing aids are not adequate; Gerona is regarded as particularly poor owing to its proximity to the Pyrenees. Balpa member pilots flying to the Spanish holiday resorts claim that the Gerona VOR is not always radiating and that the NDBs in the area are of too low a power to be reliable, especially when there are electrical storms nearby.

Continued overleaf



One of the first Olympus 593-3B engines which have now been test run in Concorde 002 at Fairford. This work began on July 22 when all four engines were run up individually. Taxi trials should by now have begun, and first flight with the Mach 2-rated engines is imminent.

AIR TRANSPORT...

While there may be some justification for classifying certain airfields as "dangerous" it is difficult to see how Nicosia could be so assessed. The airfield lies in the central plain of Cyprus, well clear of the Troodos mountains, and it is equipped with VOR and DME. Of the airfields that have been listed as requiring closer study, improvements to Turnhouse are already in hand and a second runway is to be built; measures being taken will overcome the Balpa complaint that there is only one ILS and that it is sited on the wrong runway.

The RAF is reported to have taken exception to the inclusion of Gibraltar in the list, on the grounds that the airfield is used regularly by a wide range of military aircraft and that it is equipped with adequate aids including PAR. The position of the Gibraltar runway is such that ILS would be extremely difficult and costly to install. General reaction to the publication of the Balpa lists has been that, while member pilots have been complaining to the union, few complaints appear to have been made to the appropriate authorities who are in a position to consider remedial action. The Portuguese Government, for example, has reportedly said that pilots have not availed themselves of opportunities to comment on facilities at Faro.

"TOO MANY SUPPLEMENTALS"

THE number of US supplemental airlines flying the Atlantic should be cut from six to four, according to Pan American, and the number of flights they operate from New York and California should be restricted "if scheduled US flag service to Europe is to be preserved." The comments were made by the airline to the CAB, which is at present looking into the level of the supplementals' Atlantic activity.

Pan American says that nobody denies that there is a role for the non-scheduled airlines, but that it should, as the name implies, be supplementary; whereas in fact the supplementals' operations are "tremendously concentrated" on the prime transatlantic routes during the few months—June–September—when scheduled airlines can make any profit.

"The supplementals' traffic," says Pan Am, "is largely diverted from the scheduled carriers owing to the rate advantage they obtain from having no obligation to provide service, while the military parcels out business to them in such a way as to subsidise their hit-and-run attacks on the transatlantic market." The airline complains of widespread abuse of the CAB's charter regulations, and the inability of these regulations, even when they are observed, to prevent massive diversion of traffic.

LIGHT ON COMET CRASH

SOME further details of the accident to a Comet 4 of Dan-Air near Barcelona on July 3, in which 112 people were killed, were given by Mr Frederick Corfield, Minister of State, Board of Trade, in Parliament on July 23. He said:—

"The Spanish authorities and members of the United Kingdom Accidents Investigation Branch have been working together to reconstruct the flight path followed by the [Comet]. This shows that instead of following the normal practice of

passing over the Sabadell radio beacon before turning to the south-east and descending over comparatively low ground towards the coast, the aircraft turned on to a south-easterly heading about 25 miles before reaching Sabadell. As a result, the aircraft descended into an area of high ground and struck the slopes of Montseny at a height of about 3,500ft. The evidence available indicates that there was no pre-crash failure or malfunction of the aircraft.

"From a study of the recording of the RT conversations between Barcelona control and the aircraft, it is clear that the pilot was aware of the altitude at which he was flying and, therefore, altimeter misreading or mis-setting is not relevant. However, it also appears from this interchange of messages, which includes references to an ETA for Sabadell and a radar contact, that both the pilot and the radar controller at Barcelona mistakenly thought the aircraft had, in fact, passed over, or close to, Sabadell before descending. How this came about is not yet known. This important aspect of the investigation is being followed up in detail by the Spanish authorities."

ARCTIC SEARCH CONTINUES

A LARGE-SCALE search for the An-22 which disappeared on July 18 between Iceland and Nova Scotia had been unsuccessful up to the time this issue closed for press. Reports of faint radio messages were discounted by the Search and Rescue Centre at Halifax but it is believed that a life raft and debris observed by one of the American search aircraft on July 22 may well be from the An-22. The 23 people on board the Russian transport included doctors and mountaineering experts en route to Peru.

COLLISION NEAR BARCELONA

A BOEING 737 of Condor was in collision with a light aircraft while approaching Reus military airfield, Spain, on July 20. Reus is 100km south-west of Barcelona and is available for use by charter and club aircraft. It is reported that the light aircraft exploded on impact with the tail of the 737; no injuries were reported among the 95 passengers and five crew on board the 737, but the three persons on board the light aircraft were killed.

Caledonian Consultant Mr Ray Dobson, a junior Treasury Minister in the former Labour Government, has been appointed industrial relations consultant to the board of Caledonian Airways. Mr Dobson lost his Parliamentary seat—Bristol North-east—in last month's general election.

Premature deployment of the automatic ground spoilers is believed to have been a factor in the crash of an Air Canada DC-8 at Toronto on July 5, in which 108 people were killed. FAA flight-operations inspectors have been advised to check in-flight and training procedures regarding the spoiler systems.

No Schedules? Not altogether unexpectedly, the West German Government has turned down the application by Atlantis Airways for scheduled North Atlantic services. But the airline is to appeal to the Administrative Appeals Court against the decision. Last year Atlantis successfully appealed to the same court against a Government decision refusing it permission to operate transatlantic inclusive tours originating in Germany.

Across the Pacific American Airlines is due to inaugurate its three-times-a-week trans-Pacific service to Auckland and Sydney on August 1. The USA-Australia bilateral authorising the service was finally signed on June 29. It also permits Pan American to increase its frequency weekly between the two countries from nine to ten, and to use the 747 on some flights this year. Qantas is assured capacity equal to that of the two US airlines, and will also introduce the 747 eventually.

Gerona Accident A BAC One-Eleven of Bavaria Fluggesellschaft crashed on take-off from Gerona, Spain, on July 19. The captain and co-pilot were the only seriously injured occupants and only one of the 80 passengers required hospital treatment. The aircraft overran the runway and came to rest in an adjoining field with its fuselage broken in half. Rescue operations and investigation were hampered by the large quantity of fuel on board, but there was no fire.

£200 MILLION DART

MORE than £200 million has now been earned by the Rolls-Royce Dart turboprop during its 17 years of commercial and military service. Exports have contributed over £167 million to this total. During 1967 Dart business topped £17 million, with exports accounting for nearly £15 million of this.

Over 6,000 Darts have been delivered since 1953 when the engine entered service in the Viscount. In that time more than 55 million hours of running have been accumulated and at present the engine powers approximately 1,400 aircraft. There are over 300 Dart customers in more than 60 countries, of which 150 are executive operators. In addition to the Viscount, the Dart currently powers such types as the Fokker and Fairchild F-27, the FH-227, 748, Grumman Gulfstream I and its military derivative the VC-4A. The Hawker Siddeley Argosy, Handley Page Herald, NAMC YS-11 and General Dynamics/Convair 600 and 640 are also Dart-powered.

Since service introduction, the take-off power of the engine has been increased from the 1,400 s.h.p. of the RDa.3 with a two-stage turbine, up to the 2,750 s.h.p. developed by the current RDa.10, which has a three-stage turbine and larger compressor, giving a 53 per cent improvement in power-to-weight ratio. Specific fuel consumption has been reduced by 15 per cent since the Dart entered service.

Mercure in perspective

By G. BRUNER

A French view of Dassault's new short-haul airliner

AIR SERVICES between relatively close urban centres (400 to 800 n.m., 750 to 1,500km) face a number of utilisation problems which cannot be solved unless aircraft are specially designed with the particular operating conditions in view.

As travel distance decreases, a relatively smaller part of the journey is left to true cruising flight, which can generally be accomplished at a height where jet fuel consumption is reduced. Climb and descent take up a comparatively large part of the flight, and this lowers the block speed over the trip. All operating economics are thus affected.

In order to minimise the passenger-mile cost and make the aircraft economical the aim is to lower the cost per hour, to raise the speed and to increase the seating capacity without impairing takeoff and landing qualities.

In the hope of getting more economical results than those obtained until now with a number of existing aircraft designed for similar transport conditions, Dassault began production of the prototype Mercure short-range transport a few months ago.

The purpose of this article is to show the means chosen by Dassault engineers to gain the desired results, to outline the general concept and details of the aircraft, and to describe the manufacturing processes. For the purpose of this study, the Mercure is compared with the existing type which resembles it most closely in weight, dimensions and configuration, the Boeing 737-200—already in widespread use.

The basic idea of the Mercure project was to build a twin-jet aircraft equipped with Pratt & Whitney JT8D-11* engines (the same model as those of the Boeing, but slightly more powerful), able to carry, in the tourist version, a greater number of passengers—134 instead of 113 in the Boeing. Preserving the six-abreast seat arrangement led to considerable lengthening of the fuselage. A systematic study led to a larger and heavier aircraft.

*Dassault plans to equip production aircraft from 02 onwards with the slightly more powerful Pratt & Whitney JT8D-15 engine, with consequent performance gains (see *Flight* for February 12, page 218) and Boeing is offering various updated performance packages (*Flight* for November 13, 1969).

Ecac President Mr Henrik Winberg, head of the Swedish Aviation Board, is the new president of the European Civil Aviation Council. He has been elected for a three-year term.

Air France in Nepal Management of Royal Nepal Airlines has been taken over by Air France under the terms of a contract signed on July 13.

Captains of Air Canada flying stretched DC-8s are to be paid \$2,500-\$3,000 (£1,000-£1,210) a month under the terms of a new agreement signed recently. Viscount captains will receive \$1,900-\$2,200 (£770-£890) per month.

Fares Correction Contrary to the impression given on page 107 of *Flight* last week, a 5 per cent increase in North Atlantic fares has not yet been approved by Iata airlines. The mail vote referred to approved an interim 55 rise for one-way fares.

Luton Appointment Mr William Easterbrook has been appointed deputy director of Luton Airport in succession to Mr J. D. Melrose, who earlier this year became director. The airport, which is municipally owned, made a net profit of £244,000 last year, of which £164,000 is to be transferred to the town's general rate fund. An airport service charge of 5s per passenger is planned.

For a 540 n.m., 1,000km. range the 56,300lb, 25,600kg, empty weight of Mercure is 12 per cent higher and the 27,380lb, 12,500kg, payload is 17 per cent higher than on the Boeing. This leads to a 9 per cent increase in fuel consumption (as the engines are practically the same on both aircraft), and finally to an all-up take off weight of 107,730lb, 49,000kg, which exceeds by 15 per cent that of the American aircraft.

As the wing area of the Mercure is greater than might be expected, the loading is slightly lessened: 86lb/sq ft (against 88lb/sq ft on the Boeing). Take-off length remains practically the same, but climb is better (climbing and descent speeds will be very high: $V_{max}=380kt$ EAS; this is a major point for an aircraft designed for short-distance travel). Reduction of "dead" time—takeoff, climb and descent—improves the block speed even if the high altitude cruising speed is very similar for both aircraft.

The differences between operating conditions in the United States and in Europe would appear to favour the new French type. The Boeing is a short- and medium-range airliner; its 33,000lb, 13,500kg, capacity fuel tanks allow full passenger load ranges as great as 1,800 n.m. For the Mercure, designed to operate mainly within Europe, an 800 n.m. range was considered sufficient. It was thus possible to provide less fuel-tank volume than would otherwise have been necessary and to improve the whole project. Thanks to this decrease in fuel-tank volume, a 10 per cent reduction in structural weight of the Mercure was easily obtained.

To ensure sufficient flying speed in spite of increased weight and wing area, the drag of the whole aircraft had to be reduced. This was done in two ways: (1) by paying special attention to the nacelle-to-wing attachment, and (2) by increasing wing aerodynamic efficiency. The engines on the Mercure have been placed well forward of the wing to take best advantage of aerodynamic interactions, and the wing (if we compare it with 737 configuration) has had to be brought forward in order to obtain correct trimming. This means that its distance from the nose of the aircraft is almost the same as on the 737, that the empennage lever arm is notably larger and that the payload centre of gravity is quite near the centre of gravity of the aircraft.

The Boeing nacelle is set very near the underside of the wing; the attachment pylons are very short and thus very broad. As the Mercure powerplant is located much further forward

AIR TRANSPORT...

and as the wing of the larger aircraft is slightly higher above ground, it was possible to design a thin supporting pylon. Wind-tunnel tests have proved, claims Dassault, that the thin-nylon, forward-placed engine solution has far more advantages, as it notably decreases drag, especially at high Mach numbers.

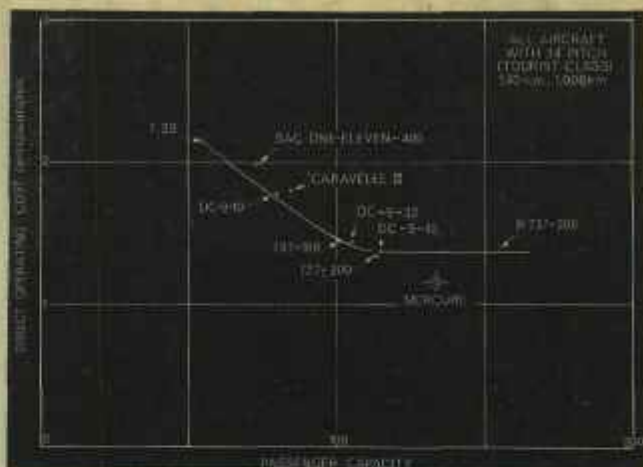
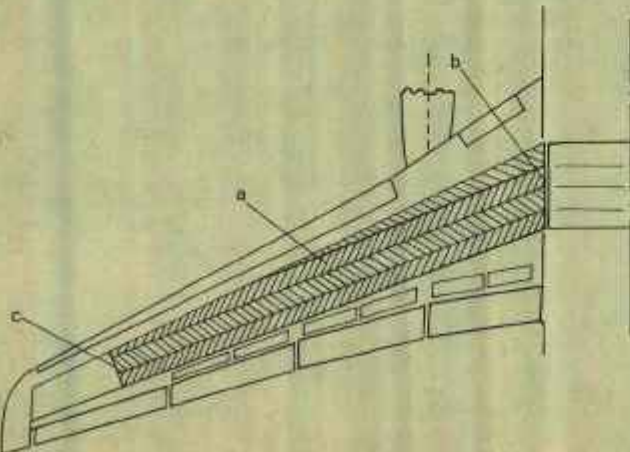
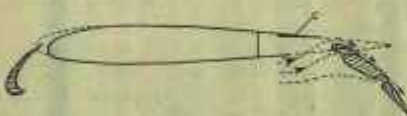
The other part of the drag gain is due to the increased efficiency claimed for a new method of wing design. Though the wing is relatively thick (12.5 per cent at the root and more than 8.5 per cent at the tip), a considerable reduction of the drag of the whole wing is stated to have been obtained; especially at high Mach numbers. This was made possible through a three-dimensional calculation of the whole wing and of the (Karman) wing fairing. These calculations were done with a television screen-coupled computer; the best-looking solution was tested on wind tunnel models.

The Boeing 737 has the same fuselage maximum cross-section as its predecessor, the 727. It is double-lobed, and its width is less than its height. With this shape, the maximum cross-section is smaller, but there is patent flattening at the cabin floor level. In this part of the fuselage, all the frames of the pressurised region must be strengthened and this makes the structure heavier. As Dassault was designing a larger aircraft and was not limited by existing production machinery, it opted for a perfectly cylindrical fuselage. This meant that there were only tensile pressurisation stresses in the skin and no supplementary bending stresses exerted on the frames. Thus the fuselage became lighter.

Another consequence of this change of shape was to make the cabin more comfortable. The internal width at passenger



Left, during cruise the slot between the first flap segment and its fixed slot is closed by the spoilers. For takeoff, the area-increasing flaps expose the slot, but deflect little. During landing, three slots are exposed. Full span leading edge slats are fitted. Bottom, layout of milled wing panels



Direct operating costs of a number of short-haul types compared with estimates for those of the Mercure

COST PER BLOCK HOUR

	£	per cent
Depreciation	127.1	23.7
Insurance	26.7	5.0
Maintenance		
Airframe manpower	23.0	26.3
Engine manpower	19.6	
Airframe spares	25.2	
Engine spares	22.4	
Maintenance	60.6	
Crew costs (2 pilots)	120.3	22.4
Fuel and oil	121.1	22.6
Totals	537.0	100
Flight time (block hours)	1.55	
Block speed (kt)	350	
Cost per aircraft n.m. (cents)	1,540	
Number of passengers	134	
Cost per seat n.m. (cents)	1.15	

elbow height on the Mercure is 6in, 15cm, greater than that on the Boeing 737. It was thus possible to widen the central aisle between the seats (from 18in to 19in, 46cm to 48cm) and to gain 3in, 7.5cm, on the total width of a three-seat group. It was also unnecessary to corner-off the arm of the last seat against the fuselage wall. Total floor width is greater and this also provides more comfort for the passenger in the outermost seat.

Cabin height is the same on both the Mercure and 737, but the circular fuselage of the Mercure also allows a gain of about one inch on wall thickness. Advantage was taken of this to increase the layers of noise-insulating material in the region most subjected to jet engine noise.

The shape of the under-floor hold is adapted to carrying Boeing 727-type 7.2 cu ft, 0.8m³ containers. In the cargo version, the circular-section fuselage of the Mercure can carry, above the floor, 86in-high igloo-type containers.

Fuselage framework in both aircraft is of the conventional type, with frames and stringers to support the skin. The difference lies in the manufacturing processes used for the covering and frames. Many of the Mercure panels are chemically processed. On the Boeing 737, for the window band, separate forged frames are used for each window and local covering stiffeners are bonded on. For the Mercure fuselage, whole large panels are milled out of the solid and no separate stiffeners are used. This method is cheaper and makes the aircraft lighter, according to Dassault.

In both types the wing framework boxes are of the two-spar type with stressed-skin covering. The Boeing 737 box has a machine-milled covering of decreasing thickness, but the longitudinal stiffeners are made of separate, riveted elements. Spars and ribs are also made of riveted sheet and angle elements.

The Mercure wing box is built almost entirely of machine-made parts. Covering of both top and underside of wing consists of four panels ([a] in diagram, left); each is milled

Continued on page 162

AIR TRANSPORT...

LIGHT COMMERCIAL & BUSINESS

Commuter Airport at Schiphol The old terminal area on the east side of Schiphol Airport, Amsterdam, which was turned into an industrial area after the inauguration of the new terminal area on the opposite side of the airport, will in the future be reopened as a terminal for commuter services. The airport management recognises that commuter services, linking important centres at rather short distances from each other, will need fast ground handling services and these will not always be readily available at large airports like Schiphol. So their intention is to create these separately on the old terminal area. Commuter aircraft can then use the old runways near the east side terminal area which are no longer used by large jet aircraft. In the next five to ten years the number of commuter services is expected to grow considerably and then the new special terminal area can come into its own. Fast bus connections to Amsterdam and to the central terminal area on the other side will then be necessary.

The first Dutch commuter service is called "Seaports Commuter Service" and is operated by National Vliegtuigbeheer with its head office in The Hague. It operates three flights from Amsterdam on Monday to Friday, two of which end at the recently opened airfield near Middelburg, the third going on to the French town of Lille. This town is also served by an early morning flight from Rotterdam. A Dornier Skyservant and a Britten-Norman Islander are used on these flights with a Cessna 206 as stand-by. The morning flight from Rotterdam to Lille gives good through connections with Air Inter flights to Lyon, Marseille and Nice.

South West to France South West Aviation of Exeter has started regular flights to link Exeter and Southampton with Cherbourg. The service is sponsored by the Cherbourg Chamber of Commerce. (The town has been without an air link with

England since the summer of 1967). Using a DC-3 there will be a return flight between Southampton and Cherbourg every Monday, Wednesday and Friday (adult return fare £14 16s). On Monday and Wednesday there will also be a return flight between Exeter and Cherbourg (adult return fare £19 16s) and passengers have a full baggage allowance of 44lb, 20kg.

Citation Training American Airlines is to provide initial crew training for all purchasers of the Cessna Citation. Training will be carried out at American's new flight training centre at Greater Southwest International Airport, Fort Worth, Texas. Under the agreement, American will make available flight and ground training for two pilots and two mechanics for each aircraft. The training will be included as part of the basic price.

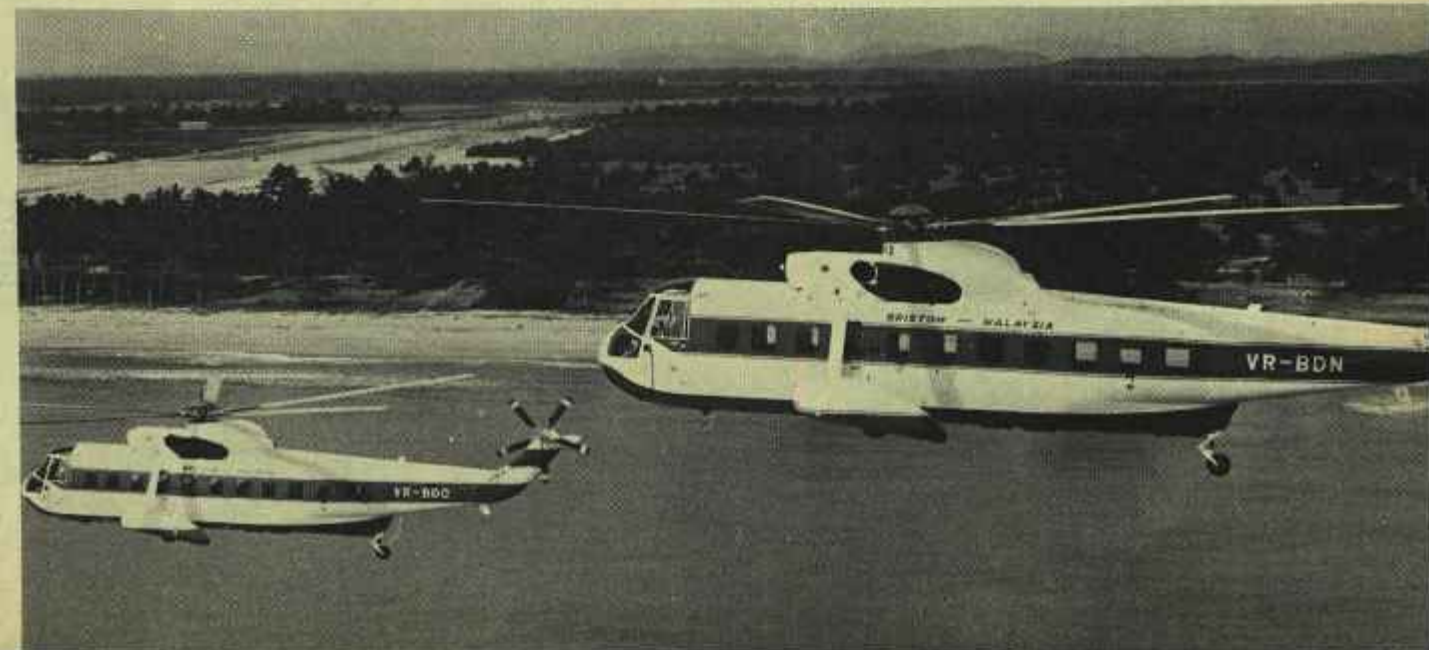
Crew members will be required to have multi-engine and instrument ratings but need not have previous jet experience. Also included will be simulator and ground class-room training for the flight crew and up to 80 hours of ground training for customer mechanics.

Turnhouse accident A BH 125, owned by the Imperial Tobacco Company crashed on take-off from Turnhouse on July 20. The port wing struck the ground as the aircraft was becoming airborne, resulting in a cartwheel and the aircraft caught fire. Captain P. Nethercott escaped with facial injuries but his copilot, Captain B. A. Ianson was killed.

Norfolk Merger Three Norfolk companies have merged to form Air Anglia. Norfolk Airways and Anglian Air Charter (who carry out charter flights) and Rig Air which serves North Sea drilling operators have combined under the financial support of the Norwich Union Insurance Group. Joint managing directors are Mr Jim Crampton and Mr Wilbur Wright with Mr Gavin Mills, an investment manager of Norwich Union, as a director. The Air Anglia fleet currently includes a DC-3 and an Islander, and several light aircraft. Further aircraft purchases are planned. Headquarters will be at Norwich Airport, but operations will also be conducted from Yarmouth.

Mr M. Lastovka We record with regret the death on July 8 of M. (Mike) Lastovka at the age of 53. After leaving his native Czechoslovakia in 1939, Mike served in 311 (Czech) Squadron, RAF, and later in Coastal Command. He returned to Czechoslovakia after the war to become a navigation instructor at the Air Force Military Academy, returning to the Royal Air Force in 1949. He served in Flying Training Command and became a navigation examiner in Transport Command, finally retiring in April 1964 to become Head of Ground School at the Oxford Air Training School. Mike Lastovka was an active member of the Guild of Air Pilots and Air Navigators, whose views he represented in discussion with the Board of Trade on all aspects of flying licence examinations.

Two S-61Ns, of Bristow Helicopters, Malaysia, flying along the coast off Kuala Trengganu. In the background is Kuala Trengganu Airport. The aircraft are supporting offshore drilling rigs for Esso





Left, during a halt in the flying due to weather, Neil Williams (right) flew Bob Herendeen's Pitts. Williams plans to have his own Pitts built in this country. Below, the CAP 20 did not figure very high in the results but is still a fairly new design. Bottom, the Dalmat DM165 paid a brief visit to Hullavington during the championships



WORLD AEROBATICS '70

Hullavington progress

HALF THE BATTLE involved in any flying competition held in Europe is with the weather. Sure enough low cloud affected the flying of the final sequences of the world aerobatic championships at the end of last week. But by this time the results of both the women's championship and of the team competition had been decided. The women's prize was taken by Svetlana Savitskaya, a 21 year old engineering student from Moscow. She was the youngest woman competitor and was a last-minute replacement for the current champion Lyndmila Mochalina who was prevented from coming owing to complications from a cold. Second was another Russian Zinaida Lizunova and third was Mary Gaffaney of America.

Perhaps the success story of the event is that of the American team, who took the team prize and looked set to come very close to the Russians for the individual world champion title. After the three preliminary sequences had been flown, the first five positions were: 1st, Egorov (USSR, Yak-18); 2nd, Bob Herendeen (USA, Pitts Special); 3rd, Charlie Hillard (USA, Spinks Akromaster); 4th, Arnold Wagner (Switzerland, Akrostar); 5th Neil Williams (UK, Zlin Trener).

Herendeen's position has some history to it as at one point he had almost been out of the running. Two-thirds of the way through his third programme his engine stopped during a spin. The international jury examined the engine but could find no technical defect so the engine failure stood as pilot error and Herendeen's marks for the part-sequence had to stand.

Subsequently a petition was drawn up, led by the British team, to have Herendeen allowed to fly his sequence again. The international jury again inspected the engine of the Pitts and then they found a possible fault in the fuel system. They gave Herendeen the benefit of the doubt and he was allowed to re-fly his sequence.

Cranfield Clinic Starting today is the BLAC's summer proficiency clinic, being held at Cranfield. The instrument approach course is well subscribed and covers training in ILS and ADF procedures. The other, now well-established, courses include initial instrument, IMC rating, handling refresher and "first reserve."

Fatal Turnback The Board of Trade report* on the fatal accident to a Kensington Midget Mustang, G-ASSV, at Halfpenny Green on July 2, 1969, concludes that the accident was caused by the pilot's attempt to turn back towards the runway following an engine failure immediately after take-off. The permit to fly for the aircraft specified a Continental C-85 engine but this had been replaced by a type O-200-A prior to the last flight. The latter engine had no provision for a fuel pump and relied on gravity feed from a 9½ gallon tank forward of the instrument panel. The flexible pipe from the fuel filter to the carburettor was replaced and post-crash inspection showed that a sliver of rubber was obstructing the adaptor at the fuel filter end of the pipe.

The report notes that no fuel flow checks were made after the new engine had been installed; comparative tests carried out during the investigation indicated that with the aircraft in a 10 degree nose up attitude the restricted fuel flow would be insufficient to meet the demand from the engine at full power.

Both lapstrap D-rings fractured previously, one by welding and one by brazing. The latter repair had been cleaned up by filing to such an extent that the strength of the joints was considerably reduced.

*HMSO CAP338, Price 4s 6d.

RESERVED

THIS SPACE IS RESERVED for those who fly at Carlisle. Beneath these open skies lies the airport, with its superb runways, its sophisticated training equipment and its highly professional instructors. Being part of the CSE Group of Companies, Carlisle is one of the Oxford Air Training Schools, the biggest in Europe.

The next Oxford Air Training Schools CPL/IR Course starts on October 26th. If you wish to be considered for the course, send in this coupon now.

To: The Registrar, Oxford Air Training School, Oxford Airport, Kidlington. Please send me full details of your CPL/IR Course.

Name _____

Address _____



FIELDS' instrument division has the know-how to service the aircraft of the world...



efficiently!

Our Instrument and Ancillary Division is one of the largest organisations of its type in Britain — and one of the most experienced.

In our extensive modern facility at Croydon, skills and know-how gathered in nearly 20 years of operation are put to work for airlines, air forces, Government departments. We are constantly developing new services, new facilities.

But one thing never changes: our policy of combining quality and reliability with the fastest possible turnround and the lowest possible prices.



Fields

FIELD AIRCRAFT SERVICES LIMITED

12 Imperial Way, Purley Way, Croydon, Surrey

Telephone 01-688 7777 Telex CRO 917382

HEATHROW Tel: 01-759 2141

EAST MIDLANDS AIRPORT Tel: 0332 810910

Here, where the
action is...



you'll find the
Mk. 3A helmet



Where situations are tough and demanding, you'll find the Mk. 3A standing up to the pace.

That's why Air Gregory Ltd — noted for their aerial services to the feature film and television industries — chose it for their helicopter crews.

Sound reasoning for sound protection.



**HELMETS
LIMITED**

Wheathampstead, St. Albans, Hertfordshire. Tel: Wheathampstead 2221



A SIMULATOR FOR THE PRIVATE PILOT

THE COVETED IMC RATING, without which a private pilot cannot fly except in Group Captain's weather, is neither cheap nor easy to get. Although for the approved IMC rating course the minimum number of hours is ten, the rating is a big jump in airmanship for the average new PPL-holder, whose standard of training still leaves much to be desired (some British pilots are licensed to fly without ever having been given a check list, shown an engine failure, or given one minute's instruction or debriefing in a classroom, if indeed their club has a classroom).

The reasons for this state of affairs are a never-ending topic of discussion among top instructors and examiners—and indeed among pupils who repeatedly have occasion to discover the inadequacies of their training.

One British company which specialises in simulator training—Waltham Flight Simulators Ltd of White Waltham—has produced a device which, it claims, will help to improve matters. It is a flight simulator to fill the gap between the dear old Link and the modern electronic marvels. The Link is of course still a valuable synthetic trainer, but the locomotive-cab panel is alien to pilots trained on well-panelled Cherokees and Barons.

Waltham Flight Simulators have produced a synthetic trainer in which pilots trained in modern types feel at home, and in which they can master the essentials of I/F at £5/hr compared with up to £10/hr in a Cherokee or £30/hr in a twin. The General Purpose General Aviation Simulator (here-

The Waltham General-Aviation simulator is specifically designed to bridge the gap between the faithful old Link and the expensive systems marvel which is the modern simulator. It has been built on a budget, using Viscount control wheels, Vanguard VOR selectors and so forth, and is aimed at the budget-conscious PPL-holder out to improve his instrument-flying



inafter for brevity called the GP-GAS as they haven't thought of a catchy name for it yet) bridges the gap between the Link and the £20,000 simulator which is the next on the market. It is not being put into production, at least not yet, but it is available by the hour at White Waltham.

Waltham Flight Simulators has a staff of three instructors, who are current airline flight simulator instructors as well as two working directors, and the company operates from 0900 hr to 2100 hr seven days a week. The firm is BoT-approved for the R/T rating as well as Schedule 10 clearances. The firm is independent of any operating concern, and has contracts with such companies as BOAC, BKS (now North East) and Cambrian.

The private pilot should feel at home right away in the GP-GAS. The flight panel is laid out in the familiar Basic "T" now standardised by most light aircraft manufacturers, and the instrument reactions are just like they are "under the hood." It was difficult to believe that they were electro-mechanical responses, programmed according to the type of aircraft desired (which is everything from a Cherokee to a big twin).

Even the maddening phugoid effect is faithfully reproduced so that (for instance) when you've got the bug back down on the horizon the VSI shoots up because your speed went up which caused your lift to increase and now the instructor is telling you that you are 300ft above the altitude he told you to hold and by the time you've got that sorted out the heading has gone adrift 20 degrees. It's a sweat machine all right.

One is spared the yakityyak of the R/T which is so distracting to IF beginners but the absence of engine noise was something we personally missed. This, we understand, is being added shortly, together with a touchdown thump.

At Waltham they are particularly keen on the use of check lists, on the theory that no pilot, however experienced, can be sure to remember everything—even in a Cherokee—while working the radio and the nav and perhaps coping with turbulence. Although the GP-GAS is not a systems simulator all the switches and so on needed to perform checks are fitted.

Of course in a real aeroplane time is wasted holding, taxiing, taking-off, climbing and all the rest of it—all at a frightening number of shillings a minute. This is how a simulator can really cut down the specific cost, and of course it comes into its own for the Instrument Rating—for which half the mandatory 40hr instrument flying can be in a synthetic trainer. Try doing 12 ILS approaches in an hour in an aeroplane.

The GP-GAS is obviously economic for those pilots going for their full Instrument Ratings, and seven PPL-holders have successfully been through it. (There are, incidentally, only about 100 I-rated pilots out of 15,000 British PPL holders.) Does the GP-GAS make economic sense for those who are after their IMC Ratings? Waltham Flight Simulators claim that it does, though the Board of Trade at present allows only five hours on a simulator for eight hours in the air (the mandatory minimum requirement for an IMC rating is ten flying hours). The company argues that although eight hours' flying plus five hours on a simulator is patently more expensive than ten hours' flying, the point is that most IMC candidates need to fly very much more than the ten hours' mandatory minimum. Indeed, most IMC pupils clock up ten hours before they can even start thinking about the VDF letdown (which some advanced pilots would say is more difficult than an ILS). There is no doubt that the simulator is by far the best place to learn the VDF basic grammar.

Helmets for Helicopters Helmets Ltd, the suppliers of service safety equipment for many years, recently took another step towards equipping the civilian aviator. The helicopter division of Air Gregory is to use the Mk 3A helmet whilst carrying out the more demanding operational roles their helicopters are required to perform. Mr Tom Noblett of Helmets Ltd, sees a great need for Aerial Work pilots in many low-level roles to be at least as well protected as their service counterparts.



Left, loading a Swedish C-130 with relief supplies for Biafra. Above, June 1936 and Amy Mollison names the Monopar air ambulance "Florence Nightingale"—equipment included ice containers, blood transfusion apparatus and an oxygen tent. Below, early co-operation from the airlines—first aid and nursing in the air demonstrated aboard an Imperial Airways HP42 in October 1934.



A century of service

The British Red Cross and aviation after 100 years

IN A FEW DAYS' TIME, on August 4, the British Red Cross Society celebrates one hundred years of existence. To join in the anniversary *Flight* has taken a look at the origins, the aims and some of the workings of this organisation which, more than anything else, stands for man's duty to his neighbour.

The embryo from which the modern society has grown was the National Society for Aid to the Sick and Wounded in War, formed in 1870 largely as a result of a letter to *The Times* from a Crimean War veteran, Col Robert Loyd-Lindsay, vc, later Lord Wantage. The first Geneva Convention, signed six years earlier, was attended by British representatives but attempts to form a National Red Cross Society in England were unsuccessful. A picture today hangs in the National Headquarters in London depicting Col Loyd-Lindsay delivering £20,000 to the French during the Franco-Prussian War—by permission of Bismarck, then in Versailles. A similar sum was sent to the Prussians at the same time.

A permanent British Red Cross Committee, to assist in wars in which British troops were fighting, came into being on the eve of the Boer War in 1898, leaving the National Aid Society to help more exclusively in foreign wars. The British Red Cross Society resulted from the amalgamation of the two organisations in 1905 and received its Royal Charter three years later.

Meanwhile, branches began to appear throughout the United Kingdom and training began for service in war-time among the first of the Voluntary Aid Detachments. When the time came

in 1914, the VADs were organised by the so-called Joint War Committee of the British Red Cross Society and the Order of St John, who resumed their separate identities after the Great War.

During the Second World War, the two societies again joined forces in the War Organisation to render assistance in Europe, the Middle and Far East. At the end of hostilities this time, the two again became separate but set up a joint committee to care for those disabled in both wars. It was from this time on that concern for civilians became a permanent feature of Red Cross work.

This year marks the centenary of the British Red Cross, but the International Red Cross, with headquarters in Geneva, is older by seven years or so. The British society, with all the other national societies, is a member of the League of Red Cross, the federating body and representative at the United Nations and other both governmental and non-governmental organisations. The League and the International Committee each have two delegates on the Standing Commission, and it is this last body that carries out the work of the International Conference during the four-year periods between conventions.

The International Committee, comprising not more than 25 Swiss citizens, is an independent institution which acts as the guardian of Red Cross principles and the neutral agency which intervenes particularly in time of war. The original committee was instrumental in making the dream of M Henri Dunant, an eminent Swiss, a reality in 1863 by calling the meeting in Geneva in that year.

The association between the British Red Cross and aviation is a long-standing one, ranging from air ambulance schemes in 1931 to the present-day use of the world's airlines for anything from carrying a single patient to tons of emergency supplies. The East Lancashire branch took up the idea of an air ambulance detachment in 1931, being fortunate enough to have a benefactor who presented a de Soutter (unspecified in the archives) for the purpose. The estimated cost of a suitable aircraft at the time was apparently £1,200, so the branch must have been extremely grateful to the gentleman concerned and also to the Lancashire Aero Club, who helped to defray further costs by operating the de Soutter as a club aircraft when it was not required by the Red Cross. Unfortunately, airworthiness became doubtful in 1935 and, for lack of a suitable club/ambulance aircraft to replace the de Soutter, the project was dropped in 1937.

The job of organising the use of air travel these days has its problems, too, cost still being one of them of course. The Invalid Travel section at national headquarters in London deals with people, the Stores and Supply section with equipment, emergency relief supplies and so on.

Without any doubt, the shining example, though an exception, of what Invalid Travel can do if need be was during the Hungarian crisis of 1956. Under the guiding and organising hand of Miss Isabel Hilliers (who still runs the department), all the independent airlines of the UK combined in an extraordinary gesture to provide every aircraft they could both to get relief supplies to Austria and to bring back thousands of Hungarian refugees.

Regular use of the airlines has been made for some years now to take parties of handicapped and asthmatic children to various European and Scandinavian centres for a holiday. This obviously calls for careful study of schedules and much collaboration, not only with the airlines but also with railways and road transport organisations. The department is also responsible for carrying handicapped children of Service families living abroad out to their parents for holidays.

A panel of about 50 nurses and a very few doctors, from all over the country, is on permanent call for all kinds of duty, ranging over the whole world. More than 900 individuals every year, British nationals abroad and foreigners in the UK, are either brought home for medical care or taken abroad, perhaps because a relative has died, very often with an escort from the panel. It is always the decision of the medical officer of the airline concerned as to the exact conditions under which a patient is carried, escorted or not, with or without special equipment, separated from or among the normal passengers, and so on. If a patient can travel alone, the Red Cross may arrange for him to be met at an intermediate airport or for help to be given in changing aircraft. The prime consideration

in such cases is always finding the most direct route, then the financial arrangements are made.

Quite a small part of the work of Wg Cdr Stevenson, director of Stores and Supply, is the airlifting of disaster relief and emergency supplies. His responsibility here is to get the right amount of the right material to the destination as quickly as possible, and this may mean taking first aid packs to Northern Ireland or drugs to Turkey or blankets to Peru.

Immediately it is known that supplies are to be sent from the UK, a report is obtained from the International Red Cross in Geneva giving priorities—doctors, drugs, tents, etc. Emergency stocks of various kinds are held by the branches in this country and large stocks of most items likely to be needed are held at the Society's depot in Lewisham. The problem with the branch-held supplies of course is centralising them at the right moment for a particular aircraft at a particular airport or RAF station. Notice of take-off time can sometimes be very short.

As the priority items are procured, liaison with the carrier must obviously continue, with the national airline of the country of disaster wherever possible. If, for example, routes are unsatisfactory, any airline may be approached and, in the event of no free airlift being available, aircraft may be chartered. This policy of getting the country concerned to help itself as much as possible is reflected in the fact that, after tents had been sent to Turkey by RAF and by sea, tent material was shipped to Gadiz where extensive facilities existed already for manufacture, the inhabitants of the area being accustomed to the all-too-regular tragedy of an earthquake.

Though the demands on teamwork are extreme in times of disaster on the scale of Turkey, Romania, Hungary or Peru, they are great during the normal course of events. The Stores and Supply section buys, centrally and under competitive tender, more than 3,000 separate items on the standard inventory of Red Cross equipment—uniforms, accessories, training aids, surgical instruments, aids for the disabled, etc. All the many handbooks, instruction manuals and so on are also printed under competitive tender. The society is ever conscious that the money it spends is public in the true sense of the word.

In its hundred years the Red Cross has preserved an essential spirit of pioneering, and today its work is continually expanding. Quite apart from the everyday manning of first-aid posts at sports events, concerts and the like, the British Red Cross organises holidays at home and abroad for more than 7,000 handicapped and elderly people each year, escorts upward of 50,000 sick or disabled travellers, administers no fewer than 31 homes of all kinds and last year sent aid to six countries suffering from earthquakes, six from floods, three from cyclones, three from famine and gave relief to refugees in nine areas of armed conflict. The speed attained by using air transport means that aviation's place in these operations is not a small one. But the work of the Red Cross is of a more personal nature for most of the time. *People Helping People* is the title of a film made for this anniversary year by the Society to show the public not only the work but the training—the scene for the training is a very realistically simulated air crash at Stansted.

C.M.G.

Below, one of two young men seriously injured in a car crash in Bordeaux is brought back to England—the Red Cross co-operating with ambulance men and airport officials, and providing the escort. Below right, international aid by the British Red Cross; a Balair DC-6 chartered by the International Committee of the Red Cross is loaded for the Santa Isabel-Biafra airlift.





Last week Britain and Germany launched the development of Europe's most advanced military aircraft, the MRCA. Some of the technical problems which have to be solved during the design of such an aeroplane are described in the following article, which is an extract from the Agard symposium paper (delivered at The Hague) "Project Design of Combat Aircraft", by Mr B. O. Heath of British Aircraft Corporation. Mr Heath is MRCA project manager at BAC's Preston Division and joint systems engineering director of the MRCA industrial company Panavia Aircraft.

Design for combat

UP TO THE 1950s it was a common expectation in Great Britain and elsewhere to develop aircraft progressively as members of a growing family, each "Mark" giving either an improvement in performance—typically range or speed—or in armament and equipment specified to meet any particular new role. In many cases at least the initial phases of development were insured by the Government sponsoring parallel activities on prototypes within two or even three firms, sometimes with small-scale versions preceding the main aircraft where innovation (often size) was considered sufficiently great to warrant this. The V-bombers of the 1950s are one example of this latter aspect.

Although long production life and versatile application still remain the final aims, there are many changes in the way this now has to be secured. After competitive phases a fighter strike aircraft is developed by a single chosen firm, the first aircraft having a first flight date several years after that of its predecessor; in the United Kingdom true prototypes are not usual, service clearance being attained through a "development batch" of aircraft with a standard expected closely to resemble that of the service aircraft. These have to give a high specified performance from the start, embracing a wide variety of requirements foreseen as covering the needs of many years to come.

There were many reasons for this change in procedure: within Britain it was directly sponsored by requirements from the Zuckermann plan which itself reflected deeper reasons such as led to the industrial rationalisation. These included the desire to avoid duplication, reaction to the difficulties from trying to extrapolate subsonic development across the speed of sound which had led to some expensive but finally abortive propositions; the higher development content and greater absolute price of the subsequent aircraft which did provide genuine supersonic capabilities. The customer had a greater wish to be convinced as to the operational adequacy of any proposal; he required greater "visibility" throughout and, with the contractor, wished to avoid expensive and frustrating modifications by ensuring the best match between operational requirements and what was feasible technically, respecting reasonable cost and for a given service programme.

All this has changed and increased the scope of work in what was previously considered initial design. The length of time between completely new designs has introduced a much greater element of decision as to the degree of innovation to embody, balancing potential risk against rewards. This has to

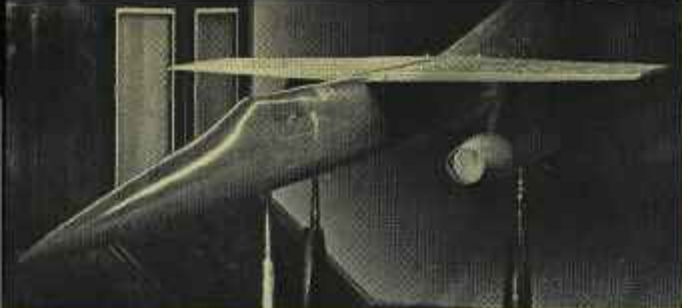
be justified to the customer and his technical agencies who will be open to the claims and attractions of a variety of existing aircraft, some of which will have had the benefit of flight development and have thereby a known, even if somewhat inferior, capability. The merits of such rival aircraft, particularly in aggregate, provide a great challenge to the project design team to provide aircraft with sufficient advantage in capability and economy as to justify commencement of their own project. They must not be tempted to promise too much.

Such considerations, and the fact that economic and operational needs set most fighter-strike aircraft on the design plateau around Mach 2 (essentially light-alloy structure subject to progressive but containable kinetic heating, directional stability and stiffness requirements), mean that the better elements of the prototype plus progressive development approach again have attractions in establishing and exploiting basic capabilities by the earliest flight development.

Parametric analysis has not been excluded by the ability for rapid synthesis of point designs in some detail; such analysis is used to establish first-order areas of design solutions as part of establishing a datum to investigate rates of exchange between performance parameters and between performance and weight. Growth factors for assessing the overall effect of extra specific items and (if existing engines are not suitable) the sizing of the engine and matching of its thermodynamic cycle to the needs of the requirement, often appeal to parametric models.

But aircraft definition is not the continuous process often postulated by parametric studies, and the earliest opportunity is taken to ensure, by a physical study and point designs, that some important but possibly peculiar non-uniformity does not in fact invalidate a general trend. Some ingenious layout may apply on one side of a given sizing, since elements of an aircraft "scale" at different rates, or conversely a design may integrate well at one size but not when much removed from it.

Throughout the design process there is a need for immediate and concise guidance for engineers and designers so that their decisions can be as soundly based as possible and ascribable to a given source. However, in contrast to the later stage of development when, for example, design office standard and stressing data sheets are precise and stable, there are many areas in the early stages of design where corresponding precision is not possible and where a clear presentation is difficult, even if a correlation exists, because of the large number of variables involved. Initial weight estimation of swept wings was once shown to be given as reliably by a simple percentage



Left, comparison of fixed-wing and variable-geometry solutions for a typical fighter. The former needs a larger wing to keep the approach and landing speeds down, but this militates against good gust response. Above and below, two wind tunnel models tested by BAC in the middle fifties during studies leading to TSR.2. Pitch-up problems with the T-tail and unacceptable gust response with the canard layout killed both



of gross weight as by complex formulae connecting aircraft weight, wing loading, design speed, sweep, thickness, taper and aspect ratio.

The forces which act on an aircraft (lift, drag, thrust and weight/inertia) and the areas which support them (wing and intake area, wetted area, cross-sectional and base areas) provide the main overall parameters requiring definition. They are conveniently grouped into ratios such as thrust/weight, wing loading, lift/drag, payload/total weight, fuel weight/total weight, etc. and, given certain supporting data, it is possible to express most performance parameters in terms of these and (say) total weight.

For example, the boundaries of sustained capability of an aircraft embracing maximum speed and ceiling, either at 1g or when manoeuvring, are all obtained when the specific excess power is equal to zero. SEP is therefore regarded as one measure of combat capability and it is now usual for at least one value of it to be specified at operationally meaningful conditions as a datum requirement it is equivalent to a steady rate of climb. It is defined as thrust minus drag, multiplied by speed/weight.

Again, most sorties are made up from individual cruise elements, over which the Breguet range equation applies:—

$$\text{Range} = \frac{\text{speed}}{\text{specific fuel consumption}} \times \frac{\text{lift}}{\text{drag}} \times \log \left(\frac{\text{take-off weight}}{\text{zero-fuel weight}} \right)$$

Take-off distances are proportional to wing loading divided by thrust/weight ratio.

It will be appreciated from these examples that apart from a few "inconveniences" such as combat allowances, reserves, trim loads, ground friction, such expressions collapse fairly readily into fairly handleable combinations of the stated ratios but apply to the particular conditions to which they relate, e.g., take-off, cruise, combat, with or without stores at landing etc. It is then necessary to relate them to a single datum condition such as take-off so that the conflicts and areas of possible solution are best presented for resolution and agreement. This collation again introduces various ratios of weights and further illustrates the need for statistically based data such as percentage structure weights. Since some elements of an aircraft are fixed (typically payload) absolute weight itself will be involved.

Single graphs may be constructed to show these relationships, for example, range may be presented as a function of T/W, W/S at take-off for several absolute weights: one weight is then

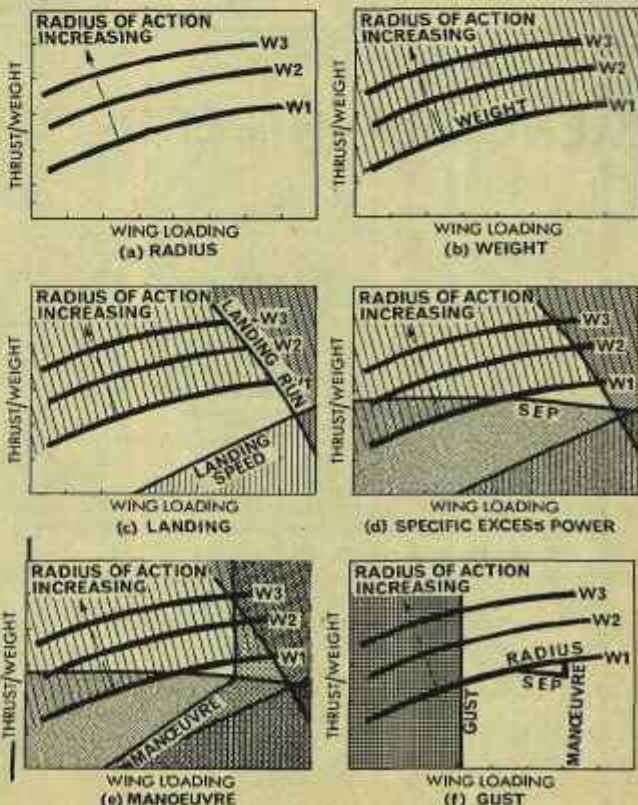
selected on cost grounds and other performance requirements added for the selected weight as a series of bounds of thrust and wing loadings. The area remaining unshaded represents a range of possible design solutions which agreed well with point designs derived less systematically.

While the above essentially aerodynamic, and to a degree non-dimensional, approach is being applied over a range of weights, an examination will be in progress to secure a single weight breakdown by growth factor methods. Knowing or postulating elements such as the fixed load of the aircraft, the approximate fractional weights of the structure and aircraft systems, an order of fuel capacity, thrust and hence engine weight, it is possible to derive an overall weight which

Continued overleaf

Design boundaries

The family of curves below illustrate the way in which operational requirements define aircraft design. Specific parameters for a hypothetical variable-geometry fighter aeroplane are plotted as functions of thrust/weight ratio and wing loading at take-off weight. Curve (a) demonstrates the increase in weight with mission radius; a weight W1 is adopted (on a basis of range, cost, etc) so that all conditions above W1 are now "out of bounds," curve (b). The maximum allowable landing speed and associated ground roll curves are put in, curve (c). If the aircraft is to be stopped in the same distance in the face of increasing wing-loading (and thus touchdown speed), greater thrust-reverse power must be available, implying an increase in thrust/weight. Curve (d) includes the minimum specific excess power which will provide the required manoeuvrability; again, conditions below this particular SEP curve are inaccessible. The options on thrust/weight and wing loading are now bounded by the small horizontal triangle with a curved side. The required manoeuvre curve (lift-limited on the sloping segment and structure-limited on the vertical element) further reduces the size of the triangle. Finally the gust response at high speed and low altitude is represented by the vertical and sloping line; areas to the left of the curve are inadmissible. The VG solution imposes no further constraints in this example, but to maintain the same "ride" in a fixed-wing design this line would have been shifted further to the right, possibly intersecting the triangle, or even leaving it in the unacceptable region altogether. An entirely fresh start may then be necessary.



DESIGN FOR COMBAT . . .

hopefully is not at variance with that emerging parametrically.

Initial engineering estimates of airframe cost are based on various statistical scalings allied to costs of avionics, engines, and bought-out items, which themselves may be empirical. Such approximations are overtaken by full estimating procedures as airframe and equipment are defined. The advance activities of production planners and supply departments assist this more meticulous synthesis of production and investment cost which is needed to meet formal contract and commercial activities associated with project definition.

As stated, in the early stages of estimation weight does provide some indication of cost via material content and size (which governs machining and fabrication manhours) but it is far from being as complete an index to the cost of fighter strike aircraft as many seem to believe.

For a given capability many items associated with crew, armament and equipment remain constant in weight and volume requirement as overall size is decreased. Drags, thrusts and many elements of weight are more nearly geared to the square of linear dimensions (the latter increasingly so as minimum-gauge considerations appear). Thus, since some overall similarity must apply as size is decreased, volume which is more nearly falling as a cube law becomes increasingly in demand by the intrusion of the square law weights now expressed as volumes, and by the fixed requirements of crew, etc.

Assuming that practical considerations of access can be resolved (since areas have decreased), density will be higher and increasing ingenuity and refinement in design will be necessary. Assembly time will not drop as predicted and the greater recourse to more refined structure to beat minimum gauges will be more costly than expected. Accommodation of fuel becomes increasingly difficult, leading to more complex tank shapes, greater sealing difficulty and production complexity.

The absolute dimensions available for control surfaces, hinges and actuators become an increasing challenge. Engines may themselves be less attractive at very small sizes because of scale effects on blades and because of mechanical complexity akin to minimum gauges.

The effect of all such factors is to introduce increasing

complexity as size is unduly reduced, such that the variation of cost eventually reverses with respect to weight.

It seems well understood that weight-saving exercises introduced after primary definition are expensive, but the effect of excessive ambition on weight-saving in early phases does not appear to be similarly appreciated. It may be that growth factors derived on much larger aircraft subject to such extreme emphasis on performance as to place them on the one-for-one "payload" ratio line are responsible.

Part of the manufacturer's project effort in the feasibility and definition phases will be to convince its own board and the several levels of officials involved that cost estimates are accurate and comprehensive, not only on unit production price but also on research and development. Production price is more readily susceptible to specific illustration through the application of statistics (both gross and detailed) which have been compiled over many years (e.g. by rate-fixed) and which remain valid for light-alloy aircraft. Research and development costs have been notoriously difficult to assess; with benefit of hindsight initial underestimation is more readily identifiable than any particular inefficiency of execution. Empirical examinations are available giving the variation of R&D cost with such factors as design speed, weight, wing loading. Tooling receives similar treatment, but the scatter is too great for commercial purposes. Data has now been accumulated from later detail recording to enable total estimates to be built up from many elements of design, flight and ground test, tooling, etc. which provide the basis for budgetary control on the new project. Such data is very necessary to condition undue optimism that the passage of time and the application of accumulated experience can completely eliminate unknowns and enable a minimum estimate of cost and timescale to be implemented. This could be approached with restraints such as selection of existing equipment and modest initial performance but the usual level of operational demands and the need for minimum unit cost have the effect of continually pressing the state of the art so that development content includes much that is not routine; allowances have to be made for what is achievable in practice so that reference to past records is essential.

MERCURE IN PERSPECTIVE

(Continued from page 154)

out in one piece together with its longitudinal stiffeners. Panels extend from the wing-root (b) to rib (c), the longest ones being 40ft. 12m. long. For these milling operations, Dassault uses American Onsrud machines. For eventual series production, extrusion of the panels has been considered.

The two spars are U-shaped and their vertical stiffeners are cut out of the solid like the ribs. Trapezoidal cuts are provided along the length of the rib flanges so as to leave the skin stiffeners intact. The number of manufactured elements is thus considerably diminished and assembly time is greatly decreased. This, in turn, will notably reduce production costs. It must also be pointed out that only three of the top wing-surface covering strips are riveted to the other framework elements, while all the lower skins are screwed on (according to the usual practice of the firm) and this makes assembly easier. The fourth upper wing surface panel can also be easily dismantled; this allows more thorough examination of the interior of the box. It also obviates the use of multiple inspection access points; skin panels can be made lighter and can be made more easily and more simply.

The Mercure leading edge features a mobile slat which, as on the Boeing, comes to rest in an intermediate position, so that no slot is opened during takeoff, improving the lift-drag ratio of the wing. When motion continues along a circular track, deflection increases, and a slot opens for approach and landing position. This device extends along the whole wing

span, even between the engine and the fuselage, where the Boeing 737 is equipped with a Kruger flap.

A study of Mercure operating costs, which has been compiled according to the international ATA 67 method for a 540 n.m. stage length, is summarised in the graph on page 154. Total depreciation of the equipment over 12 years, with no residual value, is assumed, and the number of block flight hours per year is taken as 3,300, giving a total life of about 40,000hr.

Price of a series-built Boeing 737 (spare parts included) is \$4.7 million, £2 million; price of a Mercure with spares is expected to be \$5.1 million (£2.12 million).

Most of the partial expenses per block flight hour are higher for the Mercure than for the Boeing, as the aircraft is larger. Finally, the total cost per hour is slightly higher. Nevertheless, as the block speed is expected to be higher and as the number of passengers is greater, the cost per seat-n.m. for the Mercure will be lower by about 1.15 cents.

This article compares a prototype under construction with an airliner already in use. It might be feared that weight and performance figures mentioned in this study of the Mercure will not be confirmed in service. But manufacture of the aircraft is already well advanced and shows that this doubt may be unjustified, especially with regard to the airframe, several assemblies of which are already completed and a little lighter than planned.

Italy's military transport: the Fiat G.222 taking off from Torino-Caselle airport on July 18 for its first flight, which lasted for about one hour. Pilots were Cdr B. Sansaverino, Fiat Aviation chief test pilot, and Cdr P. P. Trevisan



DEFENCE

SOUTH AFRICAN ARMS

A READINESS TO CONSIDER the supply to South Africa of "certain limited categories of arms, so long as they are for maritime defence directly related to the security of the sea routes" was announced by the Foreign Secretary, Sir Alec Douglas-Home, in the Commons on July 20. He made it clear that the context for any such supply was the Government's intention to give effect to the purposes of the Simonstown Agreement. He said that this had been negotiated out of concern for the free passage of ships in all circumstances on the vital sea routes round Southern Africa. In no circumstances would there be sales to South Africa of arms to enforce apartheid or for internal repression.

Shortly before the Commons debate on this politically contentious subject, the South African Minister of Defence, Mr P. W. Botha, had referred to assistance given in arms supplies by France; and a list of probable equipment to be purchased from the United Kingdom had been published in South Africa.

Mr Botha had said that South Africa would not forget assistance given to her during "difficult times" by France, and official sources in Pretoria have indicated that although South Africa would like to buy armaments from the UK, it would only obtain those which it considered were superior to French equipment or more suitable to South African requirements.

The list of equipment required from the UK included, as far as aircraft and missiles are concerned, Westland Wasp anti-submarine helicopters; Hawker Siddeley Nimrod long-range maritime reconnaissance aircraft; Hawker Siddeley Dynamics Red Top and BAC-Vapen-fabrik Penguin missiles.

South Africa will still purchase Mirages from France where necessary, but apparently is not likely to buy any more Buccaneers. However, the Anglo-French

Sepecat Jaguar is reportedly being considered as a tactical strike aircraft.

In view of Britain's demarcation lines for arms supply laid down by the Foreign Secretary, however, it looks as though the only aircraft likely to be purchased from Britain by South Africa would be Wasps and Nimrods. Even so, the British Government would probably seek an assurance that these would only be used for maritime operations in support of the Simonstown Agreement.

The full text of the statement on the supply of arms to South Africa, made in the Commons on July 20 by the Foreign Secretary and in the Lords on July 21 by the Minister of Defence, Lord Carrington, was as follows:—

"Her Majesty's Government have an overriding duty to take account of present and future strategic needs of the United Kingdom and, in that context, a particular concern for the free passage of ships in all circumstances on the vital sea routes round southern Africa. It was to that end that the Simonstown Agreement was negotiated.

"It is our intention to give effect to the purposes of that agreement and we believe that as a consequence we should be ready to consider, within that context, applications for the export to South Africa of certain limited categories of arms, so long as they are for maritime defence directly related to the security of the sea routes.

"The Government have made abundantly clear their fundamental disagreement with the racial policies of the South African Government. In no circumstances would there be sales to South Africa of arms for the enforcement of the policy of apartheid or internal repression.

"It is on this basis that the Government have naturally been concerned to consult with Commonwealth Governments and to discuss these matters with



'The chaps are just the same as 25 years ago . . . Of course, the hardware's changed': the five surviving crew members of a Lancaster, U for Uncle of No 9 Sqn, shot down on January 1, 1945, who recently visited their squadron, now flying Vulcan B.2s, at Akrotiri in Cyprus. They are, left to right (in civilian dress): Messrs "Taffy" Price, Harry Denton, R. Goebel, E. Kneebone and W. Hartshorn

them. A number of these Governments have not yet replied and a number request further information and discussion. At the same time the South African Government is also seeking clarification of the interpretation of the Simonstown Agreement: this will need consideration with the South African Government.

"The Government propose to complete these consultations and discussions before decisions are finally taken."

Israeli Missile Problems

AN ADMISSION was made by a senior Israeli staff officer last week, after the IAF had been attacking targets along the Suez Canal for 61 consecutive days, that the Air Force had still not found an answer to the problem posed by Soviet SA.2 and SA.3 surface-to-air missile systems located to the west of the canal (see *Flight* last week, page 104).



One reason for this appears to be that although missiles have been destroyed by the IAF, they have quickly been replaced by the Egyptians and their Soviet advisers under cover of darkness. The officer commented that "missiles we have destroyed, or which have fired at Israeli aircraft, are being replaced without any trouble."

He said that the Egyptians had not moved their Sams closer to the Canal, nor had the number of sites been increased, but a new Soviet heat-seeking missile capable of being fired by one man was being deployed in the Canal zone against low flying aircraft. So far, however, there had not been any reports from Israeli Air Force pilots that it had been used against them.

Israel's Tanker Force

CONFIRMATION THAT THERE ARE Stratocruiser tankers in the Israeli Air Force inventory has been obtained from news film and reports made during a big Air Force Graduation Day display on July 16. The Stratocruiser which took part was one which had been converted by Israeli Aircraft Industries; it was fitted with refuelling pods outboard of the engines and flew over with two A-4 Skyhawks attached.

Five of these ex-Pan American airliners are known to have been converted

to swing-tail transports by IAI but previously unconfirmed reports have mentioned the fact that others already modified for in-flight refuelling were obtained from surplus United States Air Force stocks some years ago.

Although comparatively slow, these piston-engine tankers now give the IAF an even longer strike range than before and it seems likely that some targets in the west and south of Egypt will now be within range of Israel's Phantoms and Skyhawks. The Egyptian High Command will now have to decide exactly which targets outside the Canal zone—additionally to those already covered—warrant SA-3 protection, and this may mean more imports of Soviet equipment to support such sites.

F-111 Wing Box 16,000hr

GENERAL DYNAMICS STATE that the F-111 wing carry-through box has been tested to the US Air Force requirement for a ten-year service life. In *General Dynamics News* the company say that it has withstood test loads equivalent to 16,000hr of flight—four times the estimated number of hours that the aircraft would actually fly in ten years. The 16,000th hour was passed recently in tests at Fort Worth division. Ground tests of the wing carry-through box are continuing to determine its ultimate fatigue life.

The F-111's variable-sweep wings are attached to the wing carry-through box, a high-strength steel assembly. Test results have verified the structural fatigue life of wing carry-through boxes installed in all production F-111 aircraft.

These carry-through boxes will be qualified for a minimum of ten-year

service life by incorporation of three refinements resulting from earlier experience in the fatigue test programme. These refinements include the addition of small gussets at the corners of an access hole, a more exacting treatment of bolt holes and bolt fit, and polishing some parts of the surface.

A four-to-one safety factor is employed in fatigue testing of F-111 structural components, mean that the wing carry-through box has to withstand four times the number of manoeuvre loadings anticipated during ten years of service operation at the rate of 400hr flying per year. The laboratory tests have now simulated manoeuvre loadings equivalent to 16,000hr flight during a 40-year period.

Switzerland's Ground-attack Choice

POSSIBILITIES THAT Switzerland might "shop around" still further for a replacement for the 200 Venoms in the Swiss Air Force, having at one time looked fairly certain to buy LTV A-7D Corsair 2s, have been made certainities with an instruction issued on July 15 by the Federal Council to the Military Department to submit alternative proposals to the Corsair. These proposals bring in American, French, Italian and Swedish possibilities—respectively the McDonnell Douglas Skyhawk A-4, Mirage Milan, Fiat G.91Y and Saab 105XH (*Flight*, July 9).

From this list it looks as though the likelihood of the A-7D being chosen is now fairly remote, apparently because of its high cost; and there is no mention of the Sepecat Jaguar, which had been considered a possibility.

The Military Department has been asked to submit its new Venom replacement proposals before the end of 1970.

Impalas for Harvards

HARVARDS IN THE Citizen Air Force squadrons in South Africa are being replaced over the next two or three years by Impalas (Aermacchi MB.326Ms, built under licence by Atlas Aircraft Corporation, Kempton Park, Transvaal). The eight CAF squadrons operate about 100 Harvards and also C-47s.

The South African Defence Minister, Mr P. W. Botha, said recently at a SAAF wings parade at Dunnottar that the Air Force was today equipped with the most modern aircraft and ground equipment. During the past few years purchases to the value of R100 million (£50 million) had been made, and further expansion was envisaged.

This unusually marked C-130 of the USAF was photographed from "Flight's" Baron over Germany on July 15; the markings are believed to be associated with the low-level snatch role for which these aircraft are employed

Spanish Air Force Starfighters, some of the 20 F-104Gs and TF-104Gs operated by the Air Force in an all-weather interception rôle



By MICHAEL STROUD

World helicopter market

The 1970 directory of helicopter operators lists, country by country in alphabetical order, some 1,930 users of rotorcraft throughout the world, an increase of about 860 since the last Flight survey appeared in July 1968.

In the civil field the replacement of piston-engined helicopters by turbine equipment is significant only in the executive and air-taxi sectors and the latest variants of the Bell 47 series of light utility helicopter continue to outnumber other types. Undoubtedly the most successful of the second-generation rotorcraft is the Bell JetRanger, orders for which now total more than 1,100 for both civil and military use. Meanwhile the Fairchild Hiller FH-1100 still appears only in modest numbers with total sales of 200 plus, while serious penetration of the civil market by the Hughes 500 seems as elusive as ever. Types likely to diminish in use unless adopted by new and more effective marketing organisations are the Brantly and Enstrom helicopters, currently out of production. Appearing for the first time are the Gates Twinjet and Bölkow 105, at this time able to claim only a handful of orders.

The most significant military helicopter continues to be the Bell UH-1 Iroquois series, more than 7,600 of which have been delivered to date, plus at least another 700 built under licence by Agusta in Italy (approximately 280), Fuji in Japan (99) and Dornier in West Germany (352). Orders for the latest variants continue unabated. The world's largest operators of rotorcraft, the US armed forces, have been omitted from the survey owing to lack of precise details concerning the numbers of each type in service. However, US military helicopter strength was estimated at the beginning of 1970 at around the 10,000 mark against the 1,500 plus of the Soviet armed forces. Breakdown of the US figure shows approximate totals of 7,500 for the US Army, 1,600 for the Navy, 600 for the USAF and 112 with the Coast Guard. Equivalent figures for the UK result in a total of 1,100 in service or on order, broken down as follows: the British Army operates 340 helicopters and has 550 on order, the RAF 190 and 65 on order and the Royal Navy 323 plus 140 on order.

Technical details of most types of helicopter shown in the survey can be found in the Vtol and Helicopter Survey special issue of *Flight* for February 5. Information in the United States section of the survey was derived from material provided by the Vertical Lift Aircraft Council of the Aerospace Industries Association of America.

ABU DHABI

Abu Dhabi Defence Force Air Wing Abu Dhabi—four JetRanger.
Bristow Helicopters Ltd PO Box 767, Abu Dhabi—five Whirlwind 3 (three based Das Island).

AFGHANISTAN

Royal Afghan Air Force Kabul—six Mil-1, 18 Mil-4.

ALBANIA

Albanian People's Army Air Force Tirana—eight Mil-4.

ALGERIA

Force Aérienne Algérienne Algiers—40 Mil-4, two SA-330 Puma.
Ministère de la RTPT Algiers—two Alouette II.

ARGENTINE

Agua y Energía Eléctrica Asesoría Aeronáutica Buenos Aires—four Bell 47G.
Army Aviation Command Buenos Aires—seven JetRanger, seven FH-1100.
Autair Helicopteros SRL Colon 758, DTO4, Mendoza—six Bell 47G. (A subsidiary company of Autair Helicopter Services Ltd of the UK.)
Aviandes SA Mendoza—three Hughes 269.
Comando de Aviación Naval Buenos Aires—six Bell 47D, four Sikorsky UH-19, five Sikorsky SH-34G, four Alouette III. On order: two Westland WG.13, two Alouette III.
Department of the Interior Buenos Aires—one Alouette II.

Dirección de Energía Provincia de Buenos Aires—three Hiller 12E4, three Alouette III.
Fuerza Aérea Argentina Buenos Aires—four UH-1H Iroquois, four Bell 47G, six Sikorsky S-55, six Hughes OH-6A. On order: six OH-6A, two Hughes 500.
Gobierno de la Provincia de Buenos Aires—six Bell 47, one Sikorsky S-55, three Alouette II, five Hiller UH-12E.
Gobierno de la Provincia de Entre Ríos Buenos Aires—two JetRanger.
Gobierno de la Provincia de Santa Fe—one Hiller 12E4, one UH-12C.
Gobierno de la Provincia de Santiago del Estero—one Hiller 12E4.
Government Gas Service Buenos Aires—one Sikorsky S-51.
Helipuerto Obelisco Ariel Ciro Rietti Buenos Aires—one Bell 47D, one Bell 47B.
Ministerio de Economía de la Provincia del Neuquén—one Bell 47J.
Prefectura Nacional Marítima Buenos Aires—two Bell 47J, one Bell 47G.
Ronchetti-Razetti y Cia Rosario—two Hughes 269.
Yacimientos Petrolíferos Fiscales Buenos Aires—one Hiller 12E4, one Bell 47J.

AUSTRALIA

Airfarm Associates Pty Ltd PO Box 424, Tamworth, NSW—one Hughes 269A.
Airlast Services Pty Ltd Eleventh Street, Mascot, NSW—one S-62A, one Bell 205B, three JetRanger, one Bell 47G, four Bell 47J.
Ansett Airlines of Australia 489 Swanston Street, Melbourne, Victoria—one S-61N, one JetRanger.

Army Aviation Corps Oakey, Queensland—52 Bell Sioux.

Associated Helicopter Services Pty Ltd Building 444, Bankstown Airport, NSW—two Bristol Sycamore.

Australian Helicopters Ltd Pirie Street, Adelaide, SA—two Bell 47G.

Bristow Helicopters Pty Ltd 65 Gordon Street, Osborne Park, WA—one Wessex 60, two JetRanger.

Carpentaria Exploration Pty Ltd 363 Adelaide Street, Brisbane, Queensland—one Hughes 500.

Chernco Products Pty 504 Great Eastern Highway, Redcliffe, WA—one Hughes 269A.
Commonwealth Aircraft Corporation Lorimer Street, Port Melbourne, Victoria—one Hughes 500.

Consolidated Mining Industries Ltd 78-80 Eagle Street, Brisbane, Queensland—one JetRanger.

Department of Main Roads Exford Street, Brisbane, Queensland—one JetRanger.

Department of Supply 339 Swanston Street, Melbourne, Victoria—three Alouette III.

Explorair Pty Ltd 8 Garden Court, Avalon Beach, NSW—one Hughes 269B.

Farmair Pty Ltd Tinamba, Victoria—one Bell 47G.

General Credit Ltd 41 Pirie Street, Adelaide, SA—one Bell 47J.

Hancock Prospecting Pty Ltd 150 Victoria Avenue, Dalkeith, WA—one Brantly B2.

Helicopter Charter Pty Ltd Exford Street, Brisbane, Queensland—one Bell 47G.

Helicopter Utilities Pty Ltd PO Box 173, Mascot, NSW—one Bell 47D, 11 Bell 47G, four FH-1100, three JetRanger, one Bell 204B.

Jayrow Helicopters Pty Ltd 289 Lennox Street, Richmond, Victoria—one Bell 47G, two Bell 47J, one Hughes 269A.

Ord River Crop Control Pty Ltd PO Box 410, Darwin, NT—one Bell 47D.

Purnell Helicopter Service 19 Viaduct Buildings, Queensbridge, Melbourne, Victoria—one Hughes 269A.

Rotor Services Pty Ltd PO Box 1216, Darwin, NT—one Bell 47G.

Rotor-Work Pty Ltd PO Box 174, Avalon Beach, NSW—four Bell 47G, two Bell 47J, two JetRanger.

Royal Australian Air Force Canberra ACT—15 Bell UH-1B, 22 UH-1D, 15 UH-1H Iroquois.

Royal Australian Navy Parkes ACT—20 Wessex HAS31B, five Bell UH-1B Iroquois, two Westland Scout.

Tasmanian Helicopters Pty Ltd Symmons Plain, Tasmania—one Hughes 269B.

Transport Specialities Pty Ltd Sydney—On order: one Bölkow 105.

West Australian Helicopters Pty Ltd Occidental House, 49 St Georges Terrace, Perth, WA—one JetRanger, three Bell 47G. (An associate company of Bristow Helicopters Ltd.)

Woods Helicopters Pty Ltd 49 William Street, Perth, WA—two Bell 47G. (A subsidiary company of Autair Helicopter Services Ltd of the UK.)

J. Zapletal 12 Emery Avenue, Yagoona, NSW—one Hiller UH-12C.

AUSTRIA

Aircraft KG Dr Schuh Museumstrasse 14, Innsbruck—one A-B47G.

WORLD HELICOPTER MARKET ...

Bundesministerium für Inneres Am Hof 4, Vienna 1—one Bell 47G, three A-B47G, six A-B47J, two JetRanger.
Oesterreichische Luftstreitkräfte (Austrian Air Force) Hütteldorferstrasse 126, Vienna 14—23 A-B204B, 12 JetRanger, 14 Alouette III, nine Alouette II, six A-B47G. On order: two Sikorsky S-65.

BAHAMAS

World Wide Helicopters Ltd PO Box 1667, Nassau—one Sikorsky S-55, five S-62A.

BAHRAIN

Bahrain State Police—two Westland Scout.

BELGIUM

Brussels Airways SA 1 rue de l'Eveque, Brussels—three JetRanger. On order: two Bell 47G, one Bell 47J.

Force Aérienne Belge Coxyde—five Sud H-34A, five Sikorsky S-58.

Force Navale Belge Coxyde—two Sikorsky S-58C, three Alouette III.

Force Terrestre Belge Brussels—38 Alouette II, 42 Alouette-Astazou.

Pevelco SA Wevelghem—one Hughes 269B.

SABCA Gosselies—one Hughes 269.

Sotramat SA Antwerp—one Hughes 269.

BOLIVIA

Fuerza Aerea Boliviana La Paz—12 Hughes 500M, Hiller H-23.

Helicopteros SA Casilla 1268, La Paz—three Hughes 269.

BRAZIL

Banco Brasileiro de Descontos SA Sao Paulo—one Hughes 269B.

Centrais Electricas de Minas Gerais (CEMIG) rua Itambe 114, Belo Horizonte—one Hiller UH-12E, one Bell 47G, two FH-1100.

Força Aeronaval Rio de Janeiro—four SH-3D Sea King, five SH-34J, seven Whirlwind 3, six FH-1100, three Wasp HAS1, three Hughes 269, two Widgeon, one Bell 47G, one Bell 47J.

Fuerza Aerea Brasileira Avenida Marechal Camara 233, Rio de Janeiro—six Bell SH-1D, six UH-1D Iroquois, seven JetRanger, 12 Bell 47G, six Bell 47J, five Sikorsky UH-19D.

Governo do Estado da Guanabara Rio de Janeiro—one Hughes 269B.

Governo do Estado do Parana Curitiba—one Bell 47D.

Governo do Estado do Rio Grande do Sul Porto Alegre—two Bell 47G.

Helitec Comercio e Industria Ltda Rio Branco 156, Rio de Janeiro—two Bell 47D.

Companhia Hidro-Eletrica da Bacia Esperanca (COHEBE) Rua do Passandú 58, Recife, Pernambuco—one Bell 47G.

Companhia Hidro-Eletrica do Rio Pardo (CHERP) Sao Paulo—one Bell 47G.

Companhia Hidro-Eletrica do Sao Francisco Rua Visconde de Inhauma 134-15, Rio de Janeiro—one Bell 47G, three Bell 47J, one Sikorsky S-55, two FH-1100.

Instituto Brasileiro de Reforma Agraria (IBRA) Rio de Janeiro—three Hughes 269B.

Companhia Meridional de Mineracao Rio de Janeiro—one JetRanger.

Ministerio de Agricultura Rio de Janeiro—one Bell 47D, two Bell 47G, one Hiller 360.

Motoravia Representacoes Aeronauticas Ltda Avenida Beira Mar 200, Rio de Janeiro—one Bell 47D.

Companhia Nacional de Frigorificos Sao Paulo—one JetRanger.

Organizacao Construtora e Import Andraus Ltda Sao Paulo—one Westland WS.51.

Companhia Paranaense de Energia Electrica

(COPEL) Rua Monsenhor Celsa 151, Curitiba, Parana—one Bell 47G.

Pneumac SA Campo de Marte—one Hughes 269B.

Prefeitura do Municipio de Sao Paulo Sao Paulo—one FH-1100.

Suprimentos Aeronaut do Brasil Ltda Sao Paulo—one Westland WS.51.

Transportes Aereos Rio Rio de Janeiro—On order: 12 Hughes 500.

Usinas Electricas do Parapanamena SA (USELPA) Avenida Rio Branco 156, Sao Paulo—one Bell 47J.

Viaçao Aerea Sao Paulo (VASP) Rua Libero Badaro 89, Sao Paulo—one Bell 204B.

Voos Tecnicos e Executivos SA (VOTEC) Avenida Franklin Roosevelt 115, Rio de Janeiro—four Hughes 269B, two Hughes 500.

BRUNEI

Brunei Defence Force—two Wessex 54, three Whirlwind 3, one JetRanger.

Brunei Shell Petroleum Seria—one Alouette III, two Sikorsky S-61N.

BULGARIA

Bulgarian Air Force Sofia—30 Mil-4.

BURMA

Burmese Air Force Rangoon—13 Kawasaki-Bell 47G, 13 Alouette III, 12 Kaman HH-43B Huskie.

Government of Burma Rangoon—13 Boeing-Vertol 44.

CAMBODIA

Cambodian Air Force Phnom Penh—eight Alouette II, two Alouette III, three Sikorsky S-58, one Mil-4.

CAMEROUN

Cameroun Government BP 1080, Yaounde—one Alouette III.

Compagnie Camerounaise Ardco-Aviation Douala—one Bell 47G, one A-B47G, two Alouette II.

CANADA

Agrocopter Enterprises Ltd PO Box 763, Red Deer, Alberta—two Hiller UH-12E.

Ainsworth Lumber Co Ltd Box 67, 100 Mile House, BC—one Bell 47G.

Alma Air Service Ltd Alma, Quebec—one Bell 47G.

Alpine Helicopters Ltd McCall Field, Calgary, Alberta—13 Bell 47G, two Bell 47J.

Aluminium Company of Canada Kitimat, BC—one Sikorsky S-55, two Bell 47G.

F. W. R. Angus 202 Sennerville Road, Sennerville, Ontario—one Bell 47G.

Associated Helicopters Ltd Hangar 10, Edmonton Industrial Airport, Alberta—11 Bell 47G, two Bell 204B, two JetRanger, five Bell 47J.

Athabaska Airways Ltd PO Box 100, Prince Albert, Saskatchewan—three Bell 47G, three Bell 47J.

Atlantic Helicopters Ltd 851 Mill Street, Montreal, Quebec—one Sikorsky S-55, one Bell 47G, one Hughes 500, one Hughes 269B.

Autair Helicopter Services Ltd Montreal International Airport, Dorval, Quebec—one Bell 204B, four Sikorsky S-55, one FH-1100, five Bell 47G.

Barvi Ltd 2905 Champlain, Fabreville, Quebec—one Hughes 269A.

Birmingham Helicopters Ltd 526 Lakeshore, Beaconsfield, Quebec—one Hughes 269B.

C. T. Bolton Manville Road, Scarborough, Ontario—one Brantly B2.

Bonnyville Rental Equipment Ltd Bonnyville, Alberta—one Hughes 269A.

Arthur Bouchard CP118, St. Claire, Dorchester, Quebec—two Bell 47G.

P. E. Bouffard Ltd 550 Avenue Damours, Matane, Quebec—one Bell 47G.

Bow Helicopters Ltd McCall Field, Calgary, Alberta—one Bell 205A, four Bell 204B, one Alouette III, five Alouette II, one Alouette-Astazou, seven Bell 47G, two Bell 47J.

Dr William T. Boyd PO Box 787, Timmins, Ontario—one Bell 47G.

Patrick Bronson PO Box 774, Hope, BC—one Bell 47G.

Callison Enterprises Ltd PO Box 328, Whitehorse, Yukon—one Bell 47G.

Louis Cadesky Associates 365 Bay Street, Toronto 1, Ontario—one JetRanger.

Canadian Armed Forces Ottawa, Ontario—six CH-113 Labrador, nine CH-113A Voyageur, six Vertol H-21B, four Vertol 44, three Sikorsky H-34A, seven Sikorsky UH-19F, three Bell HTL-6, 23 Hiller CH-112 Nomad, ten Bell CUH-1H Iroquois, 41 Sikorsky CHSS-2 Sea King. On order: 50 Bell CUH-1H Iroquois, 74 Bell OH-58A Kiowa.

Canadian Exploration Ltd 700 Burrard Building, Vancouver, BC—one Hughes 500.

Canadian Helicopters (1954) Ltd Montreal International Airport, Dorval, Quebec—one Sikorsky S-55, two Bell 47G.

Canadian Marconi Co Ltd 2442 Trenton Avenue, Montreal, Quebec—one Hughes 500, one Hughes 269B.

Canwest Aviation Ltd 352 19 Street, Calgary, Alberta—one Bell 47G.

Cedar Explorations Ltd Suite 203, 1033 W. Pender, Vancouver, BC—one Bell 47G.

H. F. & R. S. Clement Russell, Manitoba—one Hughes 269A.

Colmar Enterprises Ltd St. Johns, Newfoundland—one Bell 47G.

Department of Lands and Forests, Alberta Government Parliament Building, Edmonton, Alberta—three Bell 47J.

Department of Mines and Technical Surveys, Ontario Government Ottawa, Ontario—one Bell 47G.

Department of National Defense Ottawa, Ontario—one Sikorsky S-55.

Department of Transport Ottawa International Airport, Uplands, Ontario—one Sikorsky S-61N, nine JetRanger, three Alouette III, seven Bell 47G, eight Bell 47J.

Department of Transportation and Communications Quebec Government, Ancienne Lorette Airport, Quebec City, Quebec—one Bell 47J.

Paul Desourdy 3350 Laurier Street, LaSalle, Quebec—one Hughes 269B.

Dominion Helicopters Ltd PO Box 340, King City, Ontario—one Bell 205A, two JetRanger, 20 Bell 47G, one Bell 47H, one Bell 47J.

L. C. Duddridge Garage Ltd Hanley, Saskatchewan—one Hughes 269A.

J. P. Dufresne 11543 Henri Bourassa, R. des Prairies, Quebec—one Hughes 269A.

J. J. Dunn Investment Co 6 Wellington Street, Sherbrooke, Quebec—one Hughes 269B.

Eastcoast Helicopters Ltd PO Box 100, Fredericton, New Brunswick—one Bell 47G.

Eldorado Aviation Ltd Hangar 11, Edmonton Industrial Airport, Alberta—one Sikorsky S-55, one Bell 47G.

Estlin Air Services Ltd Box 1804, Regina, Saskatchewan—three Bell 47G.

Falconbridge Nickel Mines Ltd 1112 W. Pender Street, Vancouver, BC—one FH-1100.

Yvon Fournier Ltd Cap de la Madeleine, Quebec—two Bell 47G.

Fredericton Aviation Ltd PO Box 1088, Fredericton, New Brunswick—one Bell 47G.

Frontier Helicopters Ltd PO Box 10, Watson Lake, Yukon—one JetRanger, four Bell 47G.

General Enterprises Ltd PO Box 2029, Whitehorse, Yukon—one Brantly 305.



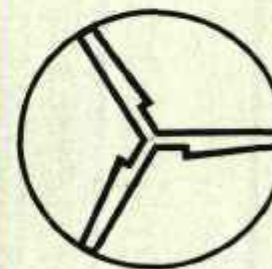
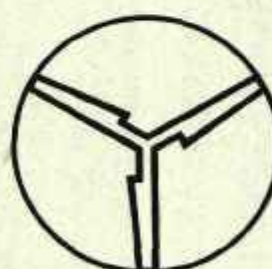
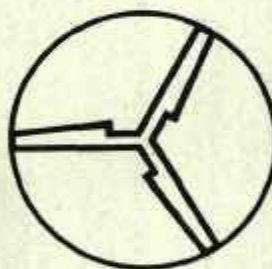
THE SA 316 B ALOUETTE 3

Another soaring lark from the famous ALOUETTE line... Another winner produced by AEROSPATIALE (S.N.I.A.S.), leading aerospace company in the European Common Market.

The SA 316 B ALOUETTE 3 handles jobs that are too big for a small helicopter. Yet it is cheaper to purchase and to operate than a heavy helicopter.

This new ALOUETTE variant is the world's only versatile helicopter with comfortable accommodation for 7 people and plenty of power to operate with 2,400 lb payload in high altitude/temperature conditions. The fully proven TURBOMECA ARTOUSTE III B turbine engine develops its 550 hp up to 16,500 ft or 45°C, ensuring unprecedented performance for rugged utility operations and personnel transport.

MORE THAN 800 ALOUETTE 3s ARE IN CIVIL AND MILITARY SERVICE IN 58 COUNTRIES THROUGHOUT THE WORLD.





Bristow Helicopters. Way above the rest

The Bristow Group of companies operate a versatile fleet of over 100 Helicopters around the globe - from the bleakness of the North Sea to the extreme heat of the Middle East and the tropical jungles of South America and Indonesia.

Our fleet of Helicopters, singly or in combination, can provide an economical and

efficient service for every type of job including Survey and Exploration work; Oil and Gas operations; Aerial Cranework; Civil and Military pilot training and Executive Charter.

If you want the benefits of the latest equipment and a reliable service at competitive rates then contract with Bristow Helicopters - we'll give you something to look up to.

BRISTOW HELICOPTERS LTD

THE LARGEST INTERNATIONAL HELICOPTER GROUP

REDHILL SURREY • TELEPHONE: NUTFIELD RIDGE 2353



WORLD HELICOPTER MARKET...

Geophysical Engineering and Surveys Ltd Toronto 1, Ontario—one FH-1100.
Dr Peter Goddard Etal, Aylesford, Kings County, Ontario—one Brantley B2.
Robert R. Grant Box 2295, Whitehorse, Yukon—one Bell 47G.
Gyro Aviation Ltd 8631 108th Street, Edmonton, Alberta—one Air & Space Model 18A.
Haida Northwestern Helicopters Ltd 610 W. Pender Street, Vancouver, BC—one Alouette II, four Hiller UH-12, two Bell 47G.
Helair Ltd PO Box 707, Kenora, Ontario—three Bell 47G.
Helicraft Ltd PO Box 117, St Hubert, Quebec—two Hughes 269A/B.
Helisolair Ltd PO Box 424, Montreal International Airport, Dorval, Quebec—four Hughes 269B.
Kurt F. Herwig PO Box 683, Brandon, Manitoba—one Brantley B2.
Hicks and Lawrence Ltd RR1, Ostrander, Ontario—one Bell 47G.
Highland Helicopters Ltd 745 W. Broadway, Vancouver, BC—three FH-1100, two Hiller UH-12, one Bell 47G.
Hudson Bay Air Transport Ltd Flin Flon, Manitoba—one FH-1100.
Hydro-Electric Commission of Ontario 620 University Avenue, Toronto 2, Ontario—one Sikorsky S-58D, one JetRanger, two Bell 47J, eight Bell 47G.
Industrial Acceptance Corporation 1320 Graham Street, Montreal, Quebec—one Hughes 269B.
Industrial Wings Ltd Vancouver International Airport, BC—one Bell 47D.
Inspiration Helicopters Ltd Heliport, 840 Walkers Line, Burlington, Ontario—five JetRanger, two Bell 47J, one Bell 47G.
Interprovincial Helicopters Ltd 220 Bay Street, Toronto, Ontario—one JetRanger.
Klondike Helicopters Ltd Hangar 1, McCall Field, Calgary 67, Alberta—one Bell 205A, two JetRanger, four FH-1100, 14 Bell 47G, five Hiller UH-12.
Lac St Jean Aviation Ltd PO Box 115, Isle Maligne, Quebec—three Alouette III, three Alouette II.
Lambair Ltd Box 808, The Pas, Manitoba—four Bell 47G.
Leo Lannan Helicopters Ltd 8950 Laburnum, Vancouver, BC—one FH-1100, two Bell 47G.
Laurentide Aviation Ltd Cartierville Airport, Montreal, Quebec—one Hughes 269B.
Leduc Excavation Ltd 3165 Cote Vertu, St Laurent, Quebec—one Hughes 269A.
Lenrice Engineering Ltd 10519 115th Street, Edmonton, Alberta—one Bell 47J.
L.F. Petroleum Products 2180 Des Laurentides, Chomedey, Quebec—one Hughes 269A.
Liftair International Ltd Hangar 4, McCall Field, Calgary, Alberta—two Bell 47G, one Bell 47J.
Elliot Lorne 704 33rd Street NW, Calgary, Alberta—one Bell 47G.
P. Macciacchi 50 Crackford Boulevard, Scarborough, Ontario—one Hughes 269B.
G. R. Macleod and Associates 2800 Bois Franc Road, St Laurent, Quebec—three Bell 47G.
Maxwell A. Macrae RR1, Elora, Ontario—one Hughes 269A.
Maritime Air Services Ltd RR4 Moncton, New Brunswick—four Bell 47G.
McGillivray Helicopters Ltd Box 396, Nanaimo, BC—one Bell 47G.
McPhail Air Services Ltd Box 143, North Battleford, Saskatchewan—two Bell 47G.
Midwest Airlines Ltd Winnipeg International Airport, Manitoba—one Bell 205A, one Sikorsky S-55, two JetRanger, 11 Bell 47G.

William Milne and Sons Box 237, North Bay, Ontario—one Bell 47G.
National Research Council Ottawa International Airport, Uplands, Ontario—one Bell 205A, three Bell 47G.
Niagara Helicopters Ltd 1 Victoria Avenue, Niagara Falls, Ontario—one JetRanger, six Bell 47G.
Northern Helicopters Ltd 995 N. Marine Drive, Vancouver, BC—six Bell 47G, one Hughes 269B.
Northern Mountain Airlines Ltd Box 368, Prince George, BC—two Bell 47G.
Northern Wings Helicopters Seven Islands, Quebec—six Bell 47G, three Hughes 269A/B.
Nova Scotia Power Commission Halifax, Nova Scotia—one Hughes 269B.
Okanagan Helicopters Ltd Vancouver Airport, BC—one Sikorsky S-61N, one S-58B, three S-55, three Bell 204B, eight FH-1100, 10 Hiller UH-12, 15 JetRanger, nine Bell 47G, three Bell 47J.
Pacific Leasing Corporation 2236 W 12th Avenue, Vancouver, BC—one Bell 47G.
Mel Pardek 1836 Adanec Street, Vancouver, BC—one Bell 47G.
Poultier Helicopters Ltd 1940 Boulevard des Laurentides, Chomedey, Quebec—one Hughes 269B.
Jens Wilbur Ravnborg Kamano, BC—one Bell 47G.
George T. Richardson 1006 Grain Exchange Building, Winnipeg, Manitoba—one Bell 47G.
Rocky Mountain Helicopters Ltd Box 424, Invermere, BC—two Bell 47G.
Rotor Aircraft Ltd Box 3823, Edmonton, Alberta—one Air & Space Model 18A.
Shirley Helicopters Ltd Hangar 9, Edmonton Industrial Airport, Alberta—six Bell 47G.
Shoreacres Broadcasting Ltd 247 Davenport, Toronto, Ontario—two Hughes 269A/B.
Skyrotors Ltd PO Box 861, Arnprior, Ontario—four Vertol V-42A, one JetRanger, three Brantley B2, four Hiller UH-12E, two UH-12L4, three Bell 47G, one Brantley 305.
Therault Air Services Ltd Montreal International Airport, Dorval, Quebec—one Hughes 269B.
Trans North Turbo Air Ltd Box 1977, Whitehorse, Yukon—two JetRanger, five Bell 47G.
Trans-Quebec Helicopters Ltd Amos, Quebec—one Bell 47G.
Transwest Helicopters (1965) Ltd Vancouver International Airport, BC—one Hughes UH-12, three Bell 47G, two Hughes 269A/B.
Twinn Pest Control Ltd 329 Fifth Avenue, Ottawa, Ontario—one Hughes 269.
United Helicopters Ltd Hangar 4, McCall Field, Calgary, Alberta—one Sikorsky S-55B, one Alouette II, six Bell 47G. On order: two Alouette II.
Universal Helicopters Ltd Carp Airport, Ontario—one Sikorsky S-55, four JetRanger, ten Bell 47G, three Hiller UH-12E.
Vancouver Island Helicopters Ltd Box 566, Sydney, BC—eight Bell 47G, one Bell 47J.
Viking Helicopters Ltd Box 349, Orleans, Quebec—five Bell 47G, one Hiller UH-12L4.
West Coast Finance Ltd 549 Howe Street, Vancouver, BC—one Brantley B2.
Whitesocks Mining Co Ltd Suite 307, 67 Yonge Street, Toronto, Ontario—one Hughes 269B.
Williams Logging Company Bella Coola, BC—one Bell 47G.

CENTRAL AFRICAN REPUBLIC
Force Aerienne Centrafricaine Bangui—one Alouette II.

CEYLON
Royal Ceylon Air Force Colombo—one JetRanger, one Hiller UH-12E, two Westland Dragonfly.

CHAD
Escadrille Chadienne Fort Lamy—one Alouette II.

CHILE
Aviacion Naval Valparaiso—11 Bell 47, four JetRanger.
Carabineros Santiago—two FH-1100.
Fuerza Aerea de Chile Santiago—four Sikorsky UH-19, two UH-1D Iroquois, 10 Hiller UH-12E.
Helicopters Chile SA Santiago—three Hiller UH-12E.

CHINA (Nationalist)
China Agricultural Air Service Taipei—one Bell 47.
Chinese Nationalist Army Taipei—On order: Bell UH-1H Iroquois.
Chinese Nationalist Air Force Taipei—seven Sikorsky UH-19, Bell HH-13. On order: six Hughes 500M.
Chinese Petroleum Corporation Miaoli—one Bell 47D.
Yung Shing Air Transport Taipei—one B47G.

COLOMBIA
Fuerza Aerea Colombiana Avenida Eldorado, Bogota—Bell UH-1B Iroquois, six HH-43B Huskie, 12 Hughes OH-6A, 16 Bell 47G, six Bell 47D, two Bell 47J, four Hiller UH-23, six Hughes 269.
Helicopteros Nacionales de Colombia SA Carrera 9, Bogota—seven Bell 204B, nine Bell 47G, nine Bell 47D, five Bell 47J, two Hiller UH-12.
Heliservicios Ltda Bienvenida—three Bell 47D.
Helivale Ltda Palmira—one Bell 47D.
Ingenio Rio Poila Ltda Cali—one Hughes 300.
Ministerio de Obras Publicas Bogota—two Hiller 360.
Petroleum Helicopters of Colombia SA Bogota—13 Bell 47G, one Bell 47J, two Bell 204B.

CONGO REPUBLIC (Brazzaville)
Congo Air Force Brazzaville—one Alouette II.

CONGO REPUBLIC (Kinshasa)
Force Aerienne Congolaise Kinshasa—eight Alouette III, seven Bell 47.
Government of Congo Kinshasa—five S-55, five Alouette II. On order: seven SA-330.

COSTA RICA
Servicio Centro Americano de Fumigacion San Jose—one Bell 47G.
Servicio Nacional de Helicopteros San Jose—one Bell 47G.
Comision de Fomento Nacional Havana—two Hiller UH-12.
Fuerza Aerea Revolucionaria Aeropuerto Libertad Marianao, Havana—Mil-1, 24 Mil-4, one Hiller UH-12A, three Bell 47G, one Bell 47H, seven Bell 47J, two Westland Whirlwind.

CYPRUS
Cyprus Defence Force Nicosia—one FH-1100, one A-B47J.

CZECHOSLOVAKIA
Czech Air Force Prague—Mil-4, Mil-8.

DENMARK
Cylindric Denmark Middelfart—one Hughes 269A.
Reno Maskinfabrik Helsingor—one Hughes 269A.
Royal Danish Air Force Vedbaek—eight Sikorsky S-61A, eight Alouette III.
Royal Danish Army Copenhagen—on order: 12 Hughes OH-6A.
Royal Danish Navy Copenhagen—five Alouette III.

WORLD HELICOPTER MARKET ...

Thanner Fly Sandbakvej 5, Brønshøj, Copenhagen—three Hughes 269A.

DOMINICA

Aviación Militar Dominicana Santo Domingo—two Alouette II, one Alouette III, Sikorsky S-55, Hiller UH-12E. On order: seven Hughes OH-6A.

DUBAI

Bristow Helicopters Ltd PO Box 3288, Deira—One JetRanger, one Whirlwind 3.

ECUADOR

Agro Aero SA Casilla 324, Guayaquil—three Hiller UH-12. Compañía Ecuatoriana de Transportes Aéreos (CEDTA) Escondido 1114, Guayaquil—one Hiller UH-12. Compañía Frutera Sud-Americana Aguirre 308, Guayaquil—one Hiller UH-12C. Exportadora Bananera Noboa Casilla 329, Guayaquil—three Hiller UH-12. Fuerza Aérea Ecuatoriana Guayaquil—three Bell H-13, one FH-1100.

Helitransportadora Nacional CA (HELI-TAN) Avenida R. Amazonas 232, Quito—one Wessex 60, one A-B204B. (An associate company of Bristow Helicopters Ltd of the UK). Sociedad Agrícola y Industrial Apartado 5, Guayaquil—four Hiller UH-12.

EGYPT

Egyptian Air Force Cairo—73 Mil-1, Mil-4, Mil-6 and Mil-8. Helicopter Rentals (Bermuda) Ltd c/o Gulf of Suez Petroleum Company, 1097 Shari'a Corniche el Nil, Cairo—two Whirlwind 3. (A subsidiary company of Bristow Helicopters Ltd of the UK.)

EL SALVADOR

Alfredo Cristiani y Co 17 Avenida Norte 313, San Salvador—three Bell 47G. Roberto Daglio Edificio Commercial 425, San Salvador—one Hughes 269. Fuerza Aérea Salvadoreña San Salvador—one FH-1100.

ETHIOPIA

Ethiopian Airlines PO Box 1755, Addis Ababa—three Bell 47J, one Bell 47G. Imperial Ethiopian Air Force Addis Ababa—five Alouette III, six A-B204B. Imperial Ethiopian Army Addis Ababa—five Alouette III, six A-B204B.

FIJI

Airfast Services Pty Ltd Suva—one Bell 47G, one Bell 47J.

FINLAND

Ilmavoimat (Finnish Air Force) Hollanti-läisentie 11, Helsinki—four Mil-4, one Mil-8, two SM-1, two Alouette II, one JetRanger. Imatran Voima O/Y PO Box 138, Helsinki—one Bell 47D. Rajavartiolaitos (Coast Guard) Helsinki—two SM-1, two JetRanger. Suomen Punainen Risti Helsinki—one Alouette II. Timi Helikopteripalvelo Vihti—one Bell 47D, one Bell 47J.

FRANCE

Aéro Club Jacques Dumas Meaux-Esbly—one A-B47G. Aeronavale 2 Rue Royale, Paris 8—46 Sud/Sikorsky H-34A/J, 26 Alouette II, 15 Alouette-Astazou, 24 Alouette III, 17 Super Frelon. On order: 80 Westland WG.13.

Agro Khan Kurim 13 Avenue de l'Opéra, Paris—one JetRanger.

Société Amboile-Chimie 79 Rue Ampère, Paris 17—two A-B47G.

L'Armée de l'Air 26 Boulevard Victor, Paris 15—100 Sud/Sikorsky H-34A, 50 Alouette II, 30 Alouette III, four Bell 47G. On order: one Super Frelon.

L'Armée de Terre 25 Boulevard Gallieni, Issy-les-Moulineaux, Paris—80 Bell 47G, 229 Alouette II, 84 Alouette III, 20 Vertol H-21, 60 Sud/Sikorsky H-34A, 20 SA 330 Puma. On order: 68 SA 330 Puma, 100 SA 341 Gazelle.

Centre National de la Recherche Scientifique Le Bourget, Paris—two Alouette II. Société Civil d'Etudes Aéronautiques 68 Rue du Rocher, Paris 8—two Djinn. Compagnie d'Exploitation Pétrolière 7 Rue Nétalon, Paris 15—one Alouette II. Electricité de France 3 Rue des Messines, Paris 8—one Alouette II, one Alouette-Astazou, one A-B47G.

Entreprises Bastian 84 Rue de l'Oberthur, Colmar—one Bell 47G.

Fenwick Aviation 4 Avenue de la Porte des Sevrès, Paris 15—one Bell 47G, one A-B 47G.

Ferdinand Gaspe 64 Sevignac-Meyracq, Pau—two Hiller UH-12B.

Gendarmerie Nationale 19 Boulevard la tour Maubourg, Paris 7—one Bell 47G, 12 Alouette II.

Compagnie Gyrafrance 14 Rue Marbeuf, Paris 8—nine Bell 47G, 14 A-B47G, three Bell 47J.

Compagnie Heli-France 14 Rue Marbeuf, Paris 8—two A-B47G, one A-B47J.

Société Heli-Union 31 Rue François Ie, Paris 8—nine Alouette II, six Alouette-Astazou, seven Alouette III.

Société Paris d'Elements Preconstraints Chemin du Marais 92 Sacy-en-Brie—one A-B47G.

Société Phitagri-Vedemo 31 Rue de l'Hotel-de-Ville, 10 Bouilly—seven Djinn.

Produits d'Usines Metallurgiques (PUM) 1-3 Place de la Beigrade, Reims—one JetRanger.

Compagnie pour la Location de Materiel 17 Rue de la Bienfaisance, Paris 8—one JetRanger.

Solas 37 Boulevard de Montmorency, Paris 16—three Alouette-Astazou, five Alouette III, five Djinn, one Super Frelon.

Société SEPATOM, 54 Rue de Varennes, Paris 7—10 Djinn.

Gerard Valentin 51 Pringy—one Djinn.

Société Voyages Wastels 3 Rue d'Australie, Metz—one A-B47G.

Daniel Wildenstein Haras de Victot, Beauvion-en-Auge—one JetRanger.

GABON

Air Gabon, BP240, Port Gentil—three Alouette II.

Société Air Service BP1232, Libreville—one Alouette-Astazou, one Bell 47J.

Société Heli-Union Port Gentil—two Alouette II.

EAST GERMANY

Luftstreitkräfte und Luftverteidigung (East German Air Force) Strausburg-Eggersdorf—Mil-1, Mil-4, Mil-8.

WEST GERMANY

Abig-Werke Carry Gross 777 Überlingen, Postfach 1270—one JetRanger.

J. F. Adolf Postfach 109, Württemberg—one Bell 47G.

Air Lloyd (Deutsche Pflanzenschutz GmbH) Porz-Wahn Flughafen, Cologne/Bonn—five Bell 47G, two A-B47G.

Allgauer Lufttransport GmbH Fellhornstrasse 15, Oberstdorf/Allgäu—one A-B47G.

Allgemeiner Deutscher Automobil Club Munich—On order: one Bölkow 105.

Gebrüder Battenfeld Maschinenfabriken GmbH Meinerzhagen—one Hiller UH-12E, one JetRanger.

Breisgauer Buch- u. Zeitschriften Vertriebs Otto Nager 7831 Windenreute, Scheutenweg—one JetRanger.

Bundesgrenzschutz (Border Police) Flughafen Hangelaar, Bonn—five UH-1D Iroquois. On order: 11 UH-1D.

Bundesrepublik Deutschland Rheindorferstrasse 198, Bonn—17 Alouette II, five Alouette-Astazou, six UH-1D.

Burda Druck & Verlag GmbH Offenbach/Baden—one JetRanger.

C. A. Clever Neustrasse 43, Euskirchen—one Hughes 269B, two A-B47J.

Deutscher Helicopter Dienst GmbH Flugplatz Hummerich, Andernach/Kretz—one Bell 47G.

Elektron Werke für Angewandte Elektronik Industriestrasse 52, Weikerheim—one Bell 47J.

Thomas Engel Niederröderweg 12, Heusenstamm—one Brantly B2B.

Freie und Hansestadt Hamburg (City Police) Beim Strohhause 31, Hamburg—two A-B47J, one Alouette-Astazou.

Fürstliche Fürstenbergische Gesamtverwaltung 771 Donauschlingen—one JetRanger.

Grundig Werke GmbH Kurgartenstrasse 37, Fürth/Bayern—one JetRanger.

Hartmann Helikopter GmbH Dorotheestrasse 239, Bonn—one Brantly B2, one A-B47G.

Franz Hartmannsberger 6056 Heusenstamm, Waldstrasse 10—one Brantly B2.

Heinrich Nach Wacht 7918 Illertsen, Postfach 140—one Hiller UH-12B.

Hesselbach und Schiller Hansa Allee 159, Düsseldorf/Oberkassel—one Hughes 269.

Heeresflieger (Army Air Corps) Bonn—204 UH-1D Iroquois, 115 Sikorsky CH-34A, 226 Alouette II/Astazou-Alouette, 20 Vertol H-21, 45 A-B47G, two Sikorsky CH-53A. On order: 80 CH-53A.

Hessische Minister des Innern Luisenstrasse 13, Weisbaden—two Alouette-Astazou.

Firma Erwin Kampf Bielstein-Mühlen—one Hughes 269B.

Klostergut Jakobsberg Hans Reigelstrasse 1, Bonn—one JetRanger.

Robert Krauthelm Elsa Brandströmstrasse 34, Nuremberg—one Brantly B2.

Kundenkreditbank KG Munich and Essen—three Hiller UH-12B, two Brantly B2, one Augusta-Bell 47G.

Land Baden-Württemberg 6 Dorotheestrasse, Stuttgart—three Alouette-Astazou.

Land Nordrhein-Westfalen Cecilienstrasse 2, Düsseldorf—five Alouette-Astazou.

Luftwaffe Erckekeilstrasse 27, Bonn—113 UH-1D Iroquois, 30 Alouette II, Bell 47G, Sycamore, Sikorsky CH-34. On order: 19 UH-1D.

Marineflieger Kiel/Holtenau—23 Sikorsky H-34A, Sycamore. On order: 22 Westland Sea King.

Merckle Flugzeugwerke GmbH (Merano Luftreederei Fluggesellschaft) Oedheim, Heilbronn, Württemberg—one Hiller UH-12B, one Hughes 269B.

Messerschmitt-Bölkow-Blohm Otto-Brunn bei München—one Bell 47H.

Motorflug GmbH Flugplatz Karthaus, Koblenz—one JetRanger, one Bell 47G.

Nordflug GmbH Tesdorfstrasse 19, Hamburg 2—one Hiller UH-12B.

Papierfabriken Heinrich Nicholas GmbH 806 Dachau, Ostenstrasse—one JetRanger.

Schreiner und Reitdorf GmbH Friedrich-Ebert-Ring 50, Koblenz—two Hughes 269A, six Hughes 269B.

Willibald Schubert Rheinstrasse, Offenthal/Hessen—one Hughes 269A.

Selmi-Bank AG Beethovenstrasse 3B, 6 Frankfurt—one A-B47J.



the Wessex beats the weather with Ferranti stability

Off-shore oil rigs have to be serviced in fair weather or foul. To help pilots to reach them and return under the worst conditions, Bristow Helicopters have installed Ferranti Stability Augmentation Systems in their Wessex machines. These take the hard work out of bad weather flying, increase safety and extend instrument flying capability.

The Ferranti Stability Augmentation System is a simple lightweight unit, reliable and low in cost and can be installed in helicopters of most types.

Write for details to -

Ferranti Limited,
Aircraft Equipment Department,
South Hill Park, Easthampstead, Bracknell,
Berkshire, England, RG12 1RA.
Telephone 1 6344 4302.

FERRANTI

Stability Augmentation Systems

BUY SUD - AVIATION ALOUETTE

**HELICOPTERS for
SAFETY
RELIABILITY
ECONOMY**

In use in 60 Countries
5-place or 7-place
For executive travel or aerial work



The 7 seater Alouette III

For full information, UK Sales, call or write to:

Helicopter Sales (Continental) Ltd.

4 YEOMAN'S ROW - LONDON - SW3

Telephone: 01-589 6052 or 6076

Cables: ALOUTTE LONDON SW3

HELICOPTER CONSULTANTS

Charter contracts negotiated
Contractors to HM Government
Finance, training and
insurance arranged



TRADEX
Instruments Ltd

MANUFACTURERS OF INDIVIDUALLY
TESTED FINE PRECISION GEARS

SPUR & SPIRAL, INT./EXT.	B55978.436	12-500 D.P.	8.00" MAX. DIA
INVOLUTE SPLINES, INT./EXT.	B553550	10/20-48/96 D.P.	8.00" MAX. DIA
SERRATIONS, —INT/EXT	B552059/A19	1/2"x36-1 1/2"x24	6.00" MAX. DIA
WORMS & WORM WHEELS	B55721	12-250 D.P.	8.00" MAX. DIA
BEVELS	B55545/MIKROM	12-175 D.P.	3.00" MAX. DIA
RACKS SPUR/SPIRAL	B55978.436	12-250 D.P.	24.00" LONG

GENEVAS . RATCHETS . SPROCKETS . TOOTHED PULLEYS
FACE CLUTCHES . PRECISION GEAR BOXES & MECHANISMS
HELICAL FLOW ROTORS

15 & 20 m/m dia. 150-2,000,000 : 1 GEAR BOXES COMPLETE
WITH WAVE WOUND VARIABLE SPEED D.C. MOTOR.
MAX. LENGTH 2.00"

67 MAPLE ROAD · SURBITON · SURREY

Tel: 01-399 2234/5/6 & 2297/8 Grams: Tradex, Surbiton



**Form
a firm
attachment
with
JUBILEE**

You can't buy a better
brand of hose clip



a Lumley-Robinson
product

WORLD HELICOPTER MARKET...

Simprop Elektronik Walter Claus Ostheide 7, Harsewinkel—one Hughes 269B.
Axel Springer & Sohn Keiser Wilhelmstrasse 6, Hamburg—one JetRanger.
Freidrich Stetzel Sandweg 20, Pforzheim—one Alouette-Astazou.
Suddutsche Luftaufnahmen 8 Munich, Leopoldstrasse 62—one Hiller UH-12B.
Sud Helicopter Flug GmbH Blumenstrasse 48, Munich 2—one JetRanger.

GHANA

Bristow Helicopters Ltd PO Box 2087, Tudu Road, Accra—one JetRanger.
Ghana Air Force Accra—three Wessex 53, six Whirlwind 3, three Sikorsky H-19D, three Hughes 269.
Ghana Government Accra—one Mil-4.

GREECE

Greek Air Force Holargos, Athens—ten Bell 47G, ten Sikorsky UH-19D, six Agusta-Bell 205.
Greek Army Athens—Bell 47G/H.
Hellenic Shipyards 4 Akademias Street, Athens—one Bell 47J.
Olympic Airways SA 6 Othonos Street, Athens—one Alouette III, one Alouette-Astazou, one SA.321F Super Frelon.
SPE (Agricultural Association) 59 Deligiorgi Street, Athens—two Agusta-Bell 47G.

GREENLAND

Gronlandsflyg A/S Godthab—four Sikorsky S-61N.
Gronlandsgeologiske under Seglser Narsarsuaq—one Augusta-Bell 47J.

GUATEMALA

Aeronaves SA Apartado Postal 16, Guatemala City—one JetRanger.
Allied Helicopters Guatemala City—seven Bell 47.
Guatemalan Air Force Guatemala City—Hiller UH-12B.

GUINEA

Government of the Republic of Guinea Conakry—one Bell 47G.

HONDURAS

Fuerza Aerea Hondurena Tegucigalpa—three Sikorsky H-19.

HONG KONG

Dragonfly Helicopters Ltd 644 Alexandra House, Hong Kong—one Bell 47G.
Hong Kong Auxiliary Air Force Kai Tak—two Alouette III.
Hutchinson International Ltd Kai Tak—two Alouette III.

HUNGARY

Hungarian Air Force Budapest—Mil-4, Mil-6.

ICELAND

Landhelgisgæslan (Coast Guard) 32 Seljavegur, Reykjavik—one Bell 47J.

INDIA

Aviation Adviser to the Government of Bombay Old Secretariat Annexe, Mayo Road, Bombay—one Hiller UH-12E.
Bharat Commerce and Industries Ltd 9 Parise Church Street, Calcutta 1—three Bell 47D.
Cambata Industries Ltd 42 Queens Road, Bombay—three Bell 47G.
Government of India Plant Protection Department New Delhi—three Bell 47G.

Helicopter Services (Pvt) Ltd Bombay—two Bell 47G.

Indamer Company (Pvt) Ltd Juhu Aerodrome, Bombay—two Bell 47G.

Indian Air Force New Delhi—12 Bell 47G, two Sikorsky S-62, 109 Mil-4, 30 Alouette III. On order: 30 Alouette III.

Indian Naval Aviation Cochin—ten Alouette III. On order: four Westland Sea King.

Khemka Aviation (Pvt) Ltd Bombay—two Bell 47G.

Mahindra and Mahindra Bombay—two Bell 47G.

Pillman Aircraft Company Mahta House, Apollo Street, Bombay—two Bell 47G.

Ram Bahadur Thakur & Company Bombay—one Bell 47G.

Sanghi Aviation Railway Road, Jodhpur—two Bell 47G.

INDONESIA

Angkatan Laut Republik Indonesia (ALRI—Naval Aviation) Djakarta—four Bell 47G, three Alouette II, Sikorsky S-58.
Anekatan Udara Republik Indonesia (AURI—Air Force) Djakarta—20 Mil-4, six Mil-6, two Bell 204B, one Sikorsky S-61A, seven Alouette III.

PT Bristow Masayu Helicopters Masayu Building, Djalan Djenderal Sudirman H18, PO Box 2107, Djakarta—nine JetRanger, two Bell 205A, one Whirlwind 3. (An associate company of Bristow Helicopters Ltd of the UK.)

National Utility Helicopter Company Djakarta—two Bell 205. On order: two Bell 205.

IRAN

Imperial Iranian Air Force (IIAF) Avenue Eisenhower, Teheran—six Kaman HH-43B Huskie, five A-B205. On order: 16 Super Falcon.

Imperial Iranian Army Aviation (IIAA) Teheran—17 Kaman HH-43B Huskie, 30 A-B205, two Whirlwind 1, 50 JetRanger. On order: 50 JetRanger, 16 CH-47C Chinook.

Imperial Iranian Gendarmerie (IIGF) Teheran—five A-B205.

Iranian Helicopters 290 Takhte Jamshid, Teheran—four Whirlwind 3, one Alouette III, one A-B204B, 11 Bell 47G, three JetRanger, one Hiller UH-12E. (An associate company of Bristow Helicopters Ltd of the UK.)

Ministry of Public Works Teheran—one Alouette II.

IRAQ

Iraqi Air Force Alwiyah, Baghdad—Mil-1, nine Mil-4, 11 Westland Wessex.

Ministry of Agriculture Baghdad—four Bell 47G.

IRELAND

Helicopter Maintenance Ltd 31 Fitzwilliam Square, Dublin 2—one Hughes 500, one JetRanger.

Irish Army Air Corps Casement Airport, Dublin—three Alouette III.

Irish Base Metals Ltd 162 Clontarf Road, Dublin 3—one JetRanger.

Irish Helicopters Ltd 46 Kildare Street, Dublin—one Alouette III, one FH-1100.
M. McNaughton Shannon Airport, Limerick—one Hughes 269B.

Trans World Helicopters Ltd Shannon Airport, Limerick—one Hughes 500.

ISRAEL

Chimavir Ltd Tel-Aviv—two Djinn.
Heil Avir le-Israel (Israel Defence Force/Air Force) PO Box 164, Deir Tzavi, Tel-Aviv—five Alouette II, 15 Alouette III, nine Super Frelon, seven Sikorsky CH-53A, 20 Sikorsky S-58B, 25 A-B205.

Masok Helicopters & Air Services 74 Petach Tikva Road, Tel-Aviv—two Bell 47G.

Wings of Israel Tel-Aviv—three NH3 Kolibri.

ITALY

Accademia Volovelistica Milanese Via Monteceneri 36, Milan—one Hughes 269A.
Aer Agricola SpA Via Tevere 1A, Rome—two Hughes 269A.

Aeronautica Militare Italiano (Italian Air Force) Viale Castro Pretorio, Rome—90 A-B47G/J, 60 A-B204B, three A-B205, two JetRanger, four Sikorsky UH-19. On order: 12 Agusta A101G.

Societa AGIP Via Dell'Arte 72, Rome—one A-B204B.

Societa Allisio Via G. Camozzi 124, Bergamo—one Alouette-Astazou.

Aziendi di Stato Foreste (Department of Forestry) Denmanale, Rome—one A-B47G.
Carabinieri/Guardia di Finanza Rome—30 A-B47G/J, 12 A-B204B.

Costruzioni Aeronautiche Giovanni Agusta SpA Cascina Costa, Gallarate—four A-B47G, two A-B205, three JetRanger.
Societa Elicopter Largo Donagani 1/2, Milan—two Bell 47G, five A-B47G.

Societa ELIS-Eliservizi Italia Via del Vignola 61, Rome—two A-B47J.

Societa Elitaliana Via M. Pucci 6, Milan—two A-B47G, one A-B47J.

Societa Elivie Piazzale Dell'Arte, Rome—five A-B204B, two JetRanger, two Sikorsky S-61N.

Elivie Toscane et dell'Arcipelago (ELITOS) Via Strozzi 2, Florence—two Hughes 500.
Compagnia Italiana Elicotteri (CIE) Via Lima 42, Rome—one Bell 47D, two A-B47G, three A-B47J.

Societa Italiana Gestione Elicotteri (SIGE) Corso Galileo Ferraris 108, Turin—three Djinn, one Alouette III.

Italian Army (C.A.A.E.) Rome—125 AB47G/J, 70 A-B204B.

Marinavia (Italian Naval Aviation) Rome—24 Sikorsky SH-3D, 24 A-B204B, six Sikorsky SH-34J, 40 A-B47G/J. On order: 30 Agusta A106.

Ministero degli Aeronautica Rome—three A-B47J.

Ministero degli Interni Rome—nine A-B47G, three A-B47J, two JetRanger.

Societa Nardi Aeroporto Forlanini, Milan—three Hughes 269B, one Hughes 500.

Societa Nazionale Metandotti S. Donato Milanese, Milan—one A-B47J.

Lionello Nelli S. Donato Milanese, Milan—one Hughes 269B.

Regione Trentino e Alto Adige Via di Torre Vanga, Trento—three A-B47J.

Floravante Shrugli Salita Santa Brigida 31/5, Genoa—one Brantly B2.

Giovanni Barone Silvestri Viale Sabotino 19/2, Milan—two Silvercraft SH-4.

Societa SIAPA Via Yser 16, Rome—two A-B47G.

Societa SNAM-Progetti Corse Venezia 16, Milan—four A-B47J.

IVORY COAST

Cote d'Ivoire Gendarmerie Abidjan—two Alouette II, three Alouette III, two SA.330C Puma.

JAMAICA

Island Helicopters Ltd 435 Spanish Town Road, Kingston—three Hughes 269B.

Jamaica Defence Force Air Wing Up Park Camp, Kingston—two Bell 47G.

JAPAN

Agricultural Aviation Association 2-chome, Ginza-Nishi, Chuo-Ku—three Bell 47G.

All Nippon Airways Hokokan Building, 1-18-1 Shinbashi, Minato-Ku, Tokyo—11 Kawasaki-Bell 47, eight Kawasaki KH-4,

WORLD HELICOPTER MARKET...

one Fuji-Bell 204B, one Mitsubishi Sikorsky S-55, two Alouette II.

Asahi Helicopter Co 2-1 Nihon-Bashi-Dohri, Chuo-ku, Tokyo—one Sikorsky S-62A, one Sikorsky S-58C, one Fuji-Bell 204B, two Alouette II, two Bell 47G, one Bell 47J, 24 Kawasaki-Bell 47G.

Asahi Press 2-chome, Yurakucho, Chiyoda-ku, Tokyo—one Bell 47J, one Kawasaki-Bell 47G, one Sud Alouette II.

Chubu Nihon Press 2-chome, Miyuki-honcho-dori, Naka-ku, Nagoya—one Bell 47J, one Kawasaki-Bell 47G.

Fuji Heavy Industries 680 Nishihara-cho, Utsunomiya City, Tochigi—one Fuji-Bell 204B.

Hankyu Airlines 31 Kadota-Machi, Kitaku, Osaka—six Bell 47G.

Higashi Nihon Airways 2255 Nobi-dome, Niiza-machi, Saitama—two Bell 47G.

Imperial Koku Co 8 2-chome, Takaracho, Chuo-ku, Tokyo—two Kawasaki-Bell 47G, **Isek Agricultural Machinery Co** 30 Yatsu-shiro-machi, Matsuyama City—one Kawasaki-Bell 47G.

C. Itoh Aircraft Maintenance Co Chofu Airport, Tokyo—one Bell 47G.

Japan Domestic Airways 20 2-chome, Uchiawai-cho, Chiyoda-ku, Tokyo—12 Kawasaki-Bell 47, three Kawasaki KH-4.

Kaijyo Jie Tai (Japanese Maritime Self Defence Force) Tokyo—29 Mitsubishi-Sikorsky HSS-2 Sea King, nine Mitsubishi-Sikorsky S-62, two Mitsubishi-Sikorsky S-61A, 14 Sikorsky HSS-1, seven Mitsubishi-Sikorsky H-19, six Kawasaki-Vertol KV107, nine Bell H-13. On order: 27 Mitsubishi-Sikorsky HSS-2 Sea King.

Kanki Airlines 1 Soze-cho, Kita-ku, Osaka—two Kawasaki-Vertol KV107.

Kawasaki Aircraft Company 5 Ginzanishi, 2-chome, Chuo-ku, Tokyo—one Kawasaki-Vertol KV107-II, Kawasaki-Bell 47G.

Kelisei Dentetsu Co 3 Gojo-cho, Taiko-ku, Tokyo—four Kawasaki-Bell 47G.

Kikijyo Jie Tai (Japanese Ground Self Defence Force) Tokyo—24 Kawasaki-Vertol KV107, 57 Fuji-Bell UH-1B, two Vertol V44, 12 Sikorsky UH-19, 14 Mitsubishi-Sikorsky S-55, 82 Kawasaki-Bell H-13, ten Kawasaki-Hughes OH-6A. On order: 22 Fuji-Bell UH-1B, 50 Kawasaki-Hughes OH-6A, 18 Kawasaki-Vertol KV107.

Koku Jie Tai (Japanese Air Self Defence Force) Tokyo—17 Mitsubishi-Sikorsky S-55, nine Mitsubishi-Sikorsky S-62, 11 Kawasaki-Vertol KV107. On order: four Kawasaki-Vertol KV107.

Mainichi Press 11 1-chome, Yurakucho, Chiyoda-ku, Tokyo—one Hughes 500, two Kawasaki-Bell 47G.

Maritime Safety Board 1 2-chome, Kasumigaseki, Chiyoda-ku, Tokyo—one Mitsubishi-Sikorsky S-55, one Mitsubishi-Sikorsky S-62, four Kawasaki-Bell 47G.

Metropolitan Police Department 2 1-chome, Kasumigaseki, Chiyoda-ku, Tokyo—three Kawasaki-Bell 47G, Fuji-Bell 204B.

Mitsui & Co PO Box 822, Tokyo—one Mitsubishi-Sikorsky S-55, 15 Bell 47D, one Bell 47G, four Bell 47J, three Fuji-Bell 204B.

Naka Nihon Koku Co 24 1-chome, Dorecho, Nakamura-ku, Nagoya—one Mitsubishi-Sikorsky S-62A, one Sikorsky S-55, four Bell 47G, five Kawasaki KH-4.

Nansatsu Tetsudo Co 171 Yamashita-cho, Kagoshima—one Kawasaki-Bell 47G.

Nihon Norin Helicopter Co 22 2-chome, Uchisaiwai-cho, Chiyoda-ku, Tokyo—26 Bell 47G, eight Kawasaki KH-4, **Nishi Nihon Kyo Co** 4-3-8 Tenjin Fukuoka City—one Mitsubishi-Sikorsky S-62A, eight Kawasaki-Bell 47G.

Osaka Airways 1436 Kuramae-cho, Naniwa-ku, Osaka—seven Kawasaki-Bell 47G, **Osaka Municipal Fire Department** Osaka—one Hughes 500.

Sangyo Keizai Shinbun Co 27 Umedacho, Kita-ku, Osaka—one Hiller UH-12B.

Shin Nihon Helicopter Co 4-chome, Ginza Nishi, Chuo-ku, Tokyo—four Kawasaki-Bell 47G, five Kawasaki KH-4, two Alouette III, **Tokyo Menka Kaisha Ltd** 2 1-chome, Otemachi, Chiyoda-ku, Tokyo—three Hughes 269.

Yomiuri Press Co 1 3-chome, Ginza Nishi, Chuo-ku, Tokyo—one Kawasaki-Bell 47G, one Yomiuri Y-1.

JORDAN

Royal Jordanian Air Force Amman—seven Alouette III, two Whirlwind 2.

JUGOSLAVIA

Aeroflota PO Box 513, Belgrade—two A-B47J.

Autocentar Marticeva 9, Zagreb—one A-B47J.

Jugoslovensko Ratno Vazduhoplovstvo (Air Force) Zemun—20 Whirlwind 2, 16 Mil-4, two Alouette III.

Savezni Geoloski Zavod Federativna Narodna Republika Belgrade—two A-B47J, **Zavod Nuklearnih Sirovina** Rovtinska Street 12, Belgrade—one A-B47J.

KENYA

Autair Helicopters (East Africa) Ltd PO Box 20447, Nairobi—one Bell 47G, one A-B47J. (An associate company of Autair Helicopter Services Ltd of the UK.) **Wilken Air Services Ltd** PO Box 4580, Nairobi—two Hughes 269B.

KOREA (North)

North Korean Air Force Pyongyang—Mil-1, Mil-4.

KOREA (South)

Korea Times 14 Chong Hak-Dong, Chongro-Ku, Seoul—one Bell 47G.

Republic of Korea Air Force Young Dong Po—one Sikorsky UH-19, five Bell UH-1D Iroquois.

KUWAIT

Kuwait Air Force PO Box 302, Kuwait—six A-B204B, two Whirlwind 2.

LAOS

Royal Lao Air Force PO Box 24,723, Vientiane—two Alouette II, four Sikorsky S-55.

LEBANON

Lebanese Air Force Rue de Damas, Beirut—three Alouette II, seven Alouette III.

LIBYA

Libyan Arab Air Force Tripoli—three Alouette II.

Libyan Arab Army Tripoli—nine A-B47G, JetRanger.

MALAGASY

Armee de l'Air Malagache Ivato—one Alouette III, one Bell 47.

Societe des Grands Moulins de Dakar PO Box 457, Tananarive—one JetRanger, one Bell 47G.

MALAYSIA

Bristow Helicopters Malaysia Sdn Bhd Sam Mansions, Jalan Tuba, Kuala Lumpur—two Sikorsky S-61N Mk II, two Wessex 60, one Whirlwind 3. (An associate company of Bristow Helicopters Ltd of the UK.)

Malaysia Air Charter Ltd Kuala Lumpur—one Westland Widgeon, one FH-1100.

Tentera Udara Diraja Malaysia (Air Force) Kuala Lumpur—ten Sikorsky S-61A, 28 Alouette III.

MEXICO

Armada de Mexico Departamento de Aeronautica (Naval Aviation) Azueta 9, Mexico City—one Bell 47G, four Bell 47J, five Alouette II.

Azucarera de Navolato SA Oasco de la Reforma 11, Mexico City—one Bell 47G. **Centro Internacional de Adiestramiento de Aviacion Civil** Avenida Hangares, Mexico City 9—one Bell 47G.

Comision Federal de Electricidad Rodano 14, Mexico 5—seven Bell 47G.

Comision Nacional Consultiva de Pesca Avenida Acuario Abregon 286, Mexico 1—three Hughes 269A.

Estado de Vera Cruz Xalapa, Vera Cruz—one Bell 47J.

Fuerza Aerea Mexicana Jefatura de la Fuerza Aerea, Lomas de Sotelo DF, Mexico—18 Bell 47G, nine Alouette III, Hiller UH-12E.

General Services Administration Mexico City—two Hiller UH-12E4.

Government of Chiapas State Tuxtla Gutierrez, Chiapas—one Hiller UH-12E.

Helicopteros SA Calz Atzacotalco la Villa 668, Mexico 16 DF—two Hughes 269.

Helicopteros del Sudeste SA Villa Hermosa, Tabasco—five Bell 47G.

Ingenio de San Cristobal y Anexa SA Lerma 63A, Mexico 5—two Hughes 269A.

Ingenio el Portero SA Edificio Reforma, Reforma y Lafragua, Mexico 1—two Hughes 269A.

Metalurgia Mexicana Penoles SA Apartado Postal 451, Monterrey—one Bell 47G.

Minister of Defence Mexico City—two Alouette II.

Minister of Health Cordoba 49, Mexico—one Hiller UH-12E4.

Petroles Mexicanos Apartados 34, Avenida Juarez 94, Mexico 1—four Hiller UH-12.

Publicas Herrerias SA Balderas 87, Mexico—one Hiller UH-12E.

Miguel Angel Roca Avenida Morelos 110, Mexico 1—one Hughes 269.

Secretaria de Agricultura y Ganaderia Departamento Forestal, Mexico City—four Hiller UH-12.

Secretaria de Comunicaciones y Transportes Avenida Xola Esquina Universidad, Mexico City—one Hiller UH-12E.

Secretaria de Hacienda y Credito Publico Mexico City—one Bell 205.

Secretaria de Recursos Hidraulicos Reforma 69, Mexico City—two Hiller UH-12E.

Servicios Aereos de America SA Apartado 23064, Mexico 9—one Hiller UH-12E4.

Servicios Halcón Avenida Hangares de Aviacion 418, Mexico 9—two Bell 47D, three Bell 47G.

Servicios Halcón Apartado Postal 116, Villahermosa, Tabasco—one Hiller UH-12A, two Hiller UH-12E.

MOROCCO

Aviation Royale Cherifienne Rabat—12 A-B205, four Alouette II, four Bell 47, four Kaman HH-43B Huskie, Hiller UH-12E.

On order: 12 A-B205.

Gendarmerie Royale Marocaine Rabat—three Alouette II.

MOZAMBIQUE

Autair Servicos de Helicopteros Ltda Caixa Postal 1763, Beira—one Sikorsky S-55, seven Bell 47G. (An associate company of Autair Helicopter Services of the UK.)

Dirrecao dos Servicos Geograficos e Cadastrais PO Box 288, Lourenco Marques—one A-B47G, one A-B47J.

Helicopteros Portugal Africa Ltda (HEPAL) Avenida da Republica 882, Laurencio Marques—two JetRanger, two Hiller UH-12E4. (An associate company of Bristow Helicopters Ltd of the UK.)

Missao de Fomento e Povoamento do Zambeze Tete—one Bell 47G, one Bell 47J.

NEPAL

Royal Flight Katmandu—one Alouette III.
Royal Nepal Airlines Katmandu—two Mil-4.

NETHERLANDS

P. H. Hofman Moordrecht—one Saro Skeeter.

KLM Nordzee Helicopters NV Plesmanweg 1, The Hague—two Sikorsky S-61N, one S-62A.

Koninklijke Luchtmacht (Air Force) 1e van den Boschstraat 8, The Hague—77 Alouette III.

NV Luchtvaart Maatschappij General Aviation Rotterdam Airport—one Bell 47G, one A-B47G, one A-B47J.

Marine Luchtvaartdienst (Naval Aviation) Lange Voorhout 7, The Hague—seven A-B204B, 11 Westland Wasp, six Sikorsky SH-34J.

Schreiner Air Transport NV Parkstraat 99, The Hague—one Alouette II, seven Alouette III.

Vliegsvindict Welschap Eindhoven—one JetRanger.

NEW CALEDONIA

Jean Lafleur BP 37, Noumea—one Hughes 269B.

Societe Le Nickel Pointe Doniambo, Noumea—one Bell 47G.

NEW GUINEA

Crowley Airways Pty Ltd PO Box 34, Lae—one JetRanger, five Bell 47G.

Helicopter Transport Pty Ltd PO Box 667, Lae—one JetRanger, one Alouette III, one Alouette-Astazou, three Bell 47G.

NEW ZEALAND

Alexander Helicopters Ltd PO Box 607, Wanganui—five Hiller UH-12E.

Angus Gordon Ltd Wanaka—one Hiller UH-12B.

Helicopter Enterprises Ltd 7 Harbour View Road, Whangarei—one Bell 47G.

Helicopter Services and Safaris Ltd 81 Waterfield Street, Wellington—one Bell 47G, one Hiller UH-12E.

Helicopters (NZ) Ltd Hangar 3, Nelson Airport—two Alouette III, six Bell 47G.

Luggate Game Packers Ltd Luggate, Otago—three Hiller UH-12E.

Marine Helicopters Ltd PO Box 1933, Auckland—two Hughes 269B.

Royal New Zealand Air Force Hobsonville, Wellington—12 Bell 47G, five Bell UH-1D Iroquois, nine UH-1H.

Royal New Zealand Navy Wellington—three Westland Wasp.

Seabrook-Fowlds 77 Symonds Street, Auckland—two Bell 47G.

Graham Stewart & Co (1965) Ltd 27 Madras Street, Christchurch—one Bell 47G.

Utility Helicopters Ltd 45 George Street, Timaru—two Bell 47G.

Whirlwind Helicopters Ltd 125 Queen Street, Hastings—three Hiller UH-12E, one Hughes 269B.

Winged Hunters Ltd 8 Browning Street, Napier—one FH-1100.

NICARAGUA

Leonel & Roger Blandon 1A Calle Norte—one Hughes 269.

Fuerza Aerea Guardia Nacional de Nicaragua Apartado 541, Managua—one Hughes 269. On order: four Hughes 500M.

NIGERIA

Aero Contractors Company of Nigeria PO Box 2141, Lagos—three Alouette II.

Bristow Helicopters (Nigeria) Ltd PO Box 11, Ikeja—three Whirlwind 3, three JetRanger. (A subsidiary company of

Bristow Helicopters Ltd of the UK.)

Federal Government Lagos—one FH-1100.

Nigerian Air Force Lagos—two Whirlwind 2, one Whirlwind 3.

Pan African Airlines (Nigeria) Ltd PO Box 1054, Ikeja—three Bell 47G, three Bell 47J.

Western State Government Ibadan—one Alouette-Astazou.

NORWAY

Fann-Fly A/S Pardis, Bergen—one Bell 47D, one Bell 47G.

A/S Flytransport Hamar—four Bell 47D, one Hughes 269B.

A/S Hamar Aviation Hamar—one Bell 47G.

E. Hansen Molde—one Bell 47G.

Helikopter Service A/S Drammensveien 40, Oslo 2—three Sikorsky S-61N, one A-B204B, two Bell 47G, two Bell 47J, three A-B47J.

Kongelige Norske Luftforsvaret (Air Force) Myntgaten 2, Oslo—32 Bell UH-1B Iroquois, four Sikorsky UH-19D, five Bell 47D, six A-B47J.

S. Larsen (Heli-Lift) Hamar—one Alouette III.

Morefly A/S Alesund—one JetRanger, one Bell 47G.

PAKISTAN

East Pakistan Government Dacca—one Hiller UH-12E.

Pakistan Air Force Peshawar—ten Sikorsky UH-19, eight Alouette III, two Mil-6, four Kaman HH-43B Huskie, three Bell 47G.

Pakistan Army Karachi—90 Bell 47G.

Pakistan International Airlines PIA Building, Karachi—one Hiller UH-12E4.

PANAMA

Arma Aerea Paraguaya (Army Aviation) Asuncion—two Bell 47G, three UH-12E.

Ave SA Panama City—one El Tomcat 5.

Gendarmerie Nacional Panama City—one FH-1100.

Helicopteros de Panama SA Box N, Panama City—four Bell 47G, three S-52.

PERU

Aeronautica SA Casilla 2786, Lima—one Hughes 269B.

Compania de Aviacion Solar SA Lima International Airport—one Bell 47G.

Fuerza Aerea del Peru Campo de Marte, Lima—nine Bell UH-1D Iroquois, six Alouette II, four Alouette III, 11 Bell 47G, Hiller UH-12B.

Alfonso Diez Hidalgo y John J. Ryan III Lima International Airport—one Bell 47G.

Pesquera Paracas SA Lampa 921, Sexto Piso, Lima—one Hughes 269A.

San Lorenzo Industrias del Mar SA 261 Avenida Espana, Lima—one Hughes 269A.

Servicio Aeronaval (Naval Aviation) Callao Arsenal—three Bell 47G.

PHILIPPINE ISLANDS

Black Mountain Inc PO Box 2869, Manila—one Hughes 269A.

Equipment Marketing Corporation PO Box 3035, Manila—four Hughes 269.

Liberty Motors Inc 202 13th Street, Manila—three Bell 47G.

Manila Times Publishing Company Manila—one JetRanger.

Mindanao Lumber Development Co 635 Vermont Street, Malate, Manila—one Bell 47G.

Philippine Air Force Nichols Air Force Base, Manila—two Mitsubishi-Sikorsky S-62A, two Sikorsky H-34, five Sikorsky UH-19, one Bell 47D, eight FH-1100.

Philippine Air Lines Makati, Rizal—one JetRanger.

Philippine CAA Manila International Airport—one Hiller UH-12B.

Republic Broadcasting System Quezon City—one Hughes 269.

San Miguel Corporation Makati, Rizal—one JetRanger.

POLAND

Polish Air Force Warsaw—40 Mil-1, Mil-2, Mil-4.

PORTUGAL

Forca Aerea Portuguesa Avenida da Liberdade, Lisbon—80 Alouette III, 12 SA.330 Puma, seven Alouette II, Sikorsky UH-19A.

Sociedade Portuguesa de Helicopteros SARI (Selicol) Rue do Telhal 70-1, Lisbon—two Djinn.

QATAR

Qatar Security Force HQ Rumailiah Fort, Dohar—two Whirlwind 3.

RHODESIA

Rhodesian Air Force PO Box 8131, Causeway, Salisbury—eight Alouette III.

RUMANIA

Rumanian Air Force Bucharest—ten Mil-4.

Rumanian Government Bucharest—two Alouette II, seven Alouette III. On order: 50 Alouette III.

SAUDI ARABIA

Director General of Mineral Resources PO Box 345, Jeddah—two Bell 47G.

Royal Saudi Air Force Jeddah—six Alouette III, 24 A-B205 JetRanger.

Saudi Arabian Airlines Jeddah—two Bell 47G, one Whirlwind 1.

SENEGAL

Armee de l'Air du Senegal Dakar-Yoff Airport—two Bell 47G.

SIERRA LEONE

Autair Helicopter Services Ltd c/o Sierra Leone Selection Trust, Howe Street, Freetown—three Bell 47G.

SINGAPORE

Singapore Air Defence Command Seletar—four Alouette III.

SOUTH AFRICA

Astra Aircraft Corporation (Pty) Ltd PO Box 1923, Johannesburg—one JetRanger.

Autair Helicopters (South Africa) Ltd PO Box 6, Halfway House, Johannesburg—one Sikorsky S-62A, one JetRanger, six Sikorsky S-55, three Bell 47G, one UH-12E.

Brick Corporation of South Africa Ltd PO Box 11062, Johannesburg—one JetRanger, one Hughes 269B.

Comair Norwich Union Building, Commissioner Street, Johannesburg—one Hughes 269A.

W. Delfs Windhoek—one Hughes 269A.

Helicopter Services (Pty) Ltd PO Box 2480, Cape Town—one Alouette III, one Alouette-Astazou, three Bell 47G, two Hiller UH-12E, three Hughes 269B. (An associate company of Bristow Helicopters Ltd of the UK.)

P. McClure PO Box 19, Knysna—one Hughes 269B.

Rotavia (Pty) Ltd Johannesburg—one B47G.

South African Navy Cape Town—six Westland Wasp.

Specialised Air Services (Pty) Ltd PO Box 1493, Johannesburg—one Djinn.

Zuid Afrikaanse Lugmag (South African Air Force) Potgieter Street, Pretoria—16 Super Frelon, 50 Alouette III, five Alouette II, nine SA.330 Puma. On order: 20 Alouette III, three SA.330 Puma.

SOUTH YEMEN

South Yemen Air Force Khormaksar, Aden—six Westland Sioux.

SOVIET UNION

Aeroflot Leningradsky Prospekt 37, Mos-

WORLD HELICOPTER MARKET...

cow A-167—Kamov Ka-18, Kamov Ka-26, Mil-1, Mil-2, Mil-4, 50 Mil-6, Mil-8, Mil-10. Soviet Air Force Moscow—Approx 1,500 Mil-1, Mil-2, Mil-4, Mil-6, Mil-8, Mil-10, Kamov Ka-15, Ka-18, Ka-20, Ka-25.

SPAIN

Armada Espanola (Army Aviation) Madrid—12 Bell UH-1D Iroquois, six Bell 47G. Avicopter SA Carranza 14, Madrid—one Alouette-Astazou, four Hughes 269A. Ejercito del Aire Plaza de la Moncloa, Madrid—five Sikorsky UH-19, 29 Bell/Agusta-Bell 47D/G, three Hiller UH-12C. Helicopteros SA (Helisa) Alcala 21, Madrid—one JetRanger, one Alouette III, eight A-B47G. Heliservicio SA Infantia 29-1, Madrid 4—four A-B47G. Jefatura Central de Trafico Amador de Los Rios 7, Madrid—one Hughes 269, two Bell 47G, three Bell 47J. Marina (Naval Aviation) Base Aeronaval, Rota—six Sikorsky SH-3D, 12 A-B204B, three Bell UH-1D Iroquois, four Whirlwind 1, three Sikorsky H-19, 10 A-B47G. Servicio Nacional de Helicopteros (SNH) Madrid—14 A-B205, four JetRanger, three A-B47J. Trabajos Aereos y Fotogram (TAF) Maestro Nicolau 21, Barcelona—three Hughes 269A/B.

SPANISH GUINEA

Comisaria General Santa Isabel de Fernando Po, Spanish Guinea—one Bell 47G.

SWEDEN

Armen (Army Aviation) Boden—nine HKP-2 Alouette II, 12 HKP-3 A-B204B, 12 HKP-6 JetRanger, two HKP-5 Hughes 269A. On order: five HKP-5. Flygvapnet (Swedish Air Force) Stockholm 80—10 HKP-4 Boeing-Vertol 107, six HKP-3 A-B204B, one HKP-2 Alouette II. Gullringsbus AB Gullringen—one JetRanger. Helikopterjanst AB Vedarslingan 3, Bandhagen—one A-B47J, three Hughes 269B. Jantlands Aero Kopmangatan 27, Osterund—one JetRanger, one A-B47J. Johnson Group—On order: one Kamov Ka-26. Kungl Flygforvaltning Stockholm 80—three JetRanger, one Alouette II, one A-B204B, three A-B47G. AB Lapplandsflyg Umea—one JetRanger, one A-B47G, two A-B47J, two Bell 47G. AB Nordflyg Eskilstuna—one Hughes 269B. AB Norrlandsflyg Gullivare—one Bell 47J. Ostermanns Aero AB Bromma Airport, Stockholm—three JetRanger, two Bell 47G, one A-B47G, one A-B47J, one Bell 47H. N. Peterson Njurunda—one Hughes 269B. S. V. Rehnstrom Hoganas—one Hughes 269B. Royal Swedish Navy Bromma—10 Vertol HKP-1, 10 HKP-2 Alouette II, three HKP-6 JetRanger. On order: seven HKP-6 JetRanger. AB Skogsflyg Arnasvall—two Hughes 269B. Svenska Aeroplan AB (SAAB) Linköping—one Hughes 269B.

SWITZERLAND

Aero Club Suisse Cointrin Airport, Geneva—one Hughes 269B. Air Glaciers SA Sion Aerodrome—two Alouette III. Air Tourisme Alpin 38 Avenue de la Gare, Martigny 1920—one Hughes 269B. Air Zermatt AG 3920 Zermatt—one JetRanger, one Alouette III.

Artec SA c/o Fides, 2 Ch. des Trois Rois, 1000 Lausanne—one JetRanger. B. Cornfeld 119 Re de Lausanne, 1200 Geneva—one JetRanger. Edicino SA 6500 Bellinzona Airport—one A-B47G, one Hughes 269B. Heliswiss AG Flughafen Bern, 3123 Belp—three A-B204B, two JetRanger, three Bell 47G, two A-B47G, one Bell 47J. Nairag AG Neugasse 23, 6300 Zug—one JetRanger. Peter Rutschmann Romerweg 29, 8302 Kloten, Zurich—one Hughes 269A. Scanair SA 88 Rte de Cointrin, 1216 Geneva—one Brantly B2. Schweizerische Eidgenossenschaft Luftamt, 3003 Berne—one Alouette II. Schweizerische Flugwaffe (Air Force) Berne—30 Alouette II, 26 Alouette III, A-B47G. On order: 60 Alouette III. Schweizerische Rettungsflugwacht Belrivestrasse 3, 8008 Zurich—one JetRanger. Transcommerce Leasing and Charter Postfach FL9490, Vaduz, Liechtenstein—one JetRanger.

SYRIA

Syrian Air Force Damascus—four Mil-1, four Mil-4, Mil-8.

THAILAND

Continental Air Services Udorn—one FH-1100. Ministry of Agriculture Bangkok—five Hiller UH-12, eight Sikorsky S-55. Ministry of National Development 962 Krung Kasem Road, Bangkok—seven Bell 204B. Royal Thai Air Force Don Muang Air Base, Bangkok—four Kawasaki-Vertol KV-107-II, 22 Sikorsky CH-34C, three Kaman HH-43B Huskie, 13 Sikorsky UH-19, 16 Kawasaki KH-4, one Hiller L4. On order: 50 Bell UH-1H Iroquois. Royal Thai Border Police Bangkok—one Mitsubishi-Sikorsky S-62A, ten Bell 204B, 16 FH-1100, ten Hiller UH-12B, one Sikorsky S-55. On order: 11 Bell 205. S.S. Motors Ltd 217 Bangkok-Smutprakarn Road, Bangkok—one Hughes 269A. Thai Sugar Corporation Bangkok—one Hiller UH-12B. Vanhee Electricity Authority Bangkok—one Bell 47G.

TRINIDAD

Helicopter Rentals (Bermuda) Ltd PO Box 714, Nagib Elias Building, Corner Queen and Charlotte Streets, Port of Spain—two Whirlwind 3, one JetRanger. (Subsidiary company of Bristow Helicopters Ltd of the UK.)

TUNISIA

Armee de l'Air Tunisienne El Aouina—two Alouette II, four Alouette III.

TURKEY

Turkish Army Ankara—Bell OH-13, A-B204B. Turkish Police Ankara—JetRanger.

UGANDA

Uganda Police Air Wing PO Box 45, Entebbe—two Westland Scout, two JetRanger.

UNITED KINGDOM

A & B Cars (Distributors) Ltd Mill Lane, Newton-le-Willows, Lancashire—one Brantly B2B. Air Hanson Ltd Luton Airport, Bedfordshire—two JetRanger. Airlift Ltd Benhams House, Horley Row, Surrey—one Bell 47D. Army Air Corps Army Aviation Centre, Middle Wallop, Hampshire—150 Westland Scout AH1, 175 Westland Sioux AH1, 15

Alouette II. On order: 300 Snias/Westland SA.341 Gazelle, 250 Westland WG.13.

Autair Helicopter Services Ltd Luton Airport, Bedfordshire—three Bell 47G, one A-B47G. (See also Autair associated companies under Argentine, Australia, Kenya, Mozambique, Sierra Leone, South Africa and Zambia.)

Aveley Tipper Services Ltd Lennard House, High Street, Aveley, Essex—one Hiller UH-12B.

BEA Helicopters Ltd Bealine House, Ruislip, Middlesex—five Sikorsky S-61N, one JetRanger.

P. Berriman Shaws Farm, Parsons Heath, Colchester, Essex—one Hughes 269B.

Bouley Investments Ltd Halkett Place, St Helier, Jersey—one Hiller UH-12.

Bristow Helicopters Ltd Redhill Aerodrome, Surrey—seven Wessex 60, 16 Westland Sioux, one Bell 47G, eight Whirlwind, 19 Hiller UH-12, five JetRanger, one Widgeon. (See also Bristow associated and subsidiary companies under Abu Dhabi, Australia, Dubai, Ecuador, Egypt, Ghana, Indonesia, Iran, Malaysia, Mozambique, Nigeria, South Africa and Trinidad.)

British Executive Air Services Ltd Kidlington Airport, Oxford—five Brantly B2A/B, one Brantly 305, one Bell 47G.

David Brown Tractors Ltd Meltham, Huddersfield, Yorkshire—three JetRanger.

BSR Ltd Monarch Works, Powke Lane, Old Hill, Staffordshire—one JetRanger.

M. Caborn-Waterfield Sedgemoor Manor, Shaftesbury, Dorset—one Brantly B2B.

Central Electricity Generating Board Sudbury House, 15 Newgate Street, London EC1—two Hiller UH-12B.

Chilton Aircraft Co c/o Singleton Fabian & Co, Lee House, London Wall, London EC2—one Brantly B2B.

B. J. Colman Digberry, Nettlebed, Henley-on-Thames, Oxfordshire—one Hiller UH-12B.

Cranfield Institute of Technology Cranfield, Bedfordshire—one Hiller UH-12B.

Constant Securities Ltd c/o Lewis Jackson, 4A Bloomsbury Square, London WC2—one JetRanger.

Cosworth Engineering Ltd St James Mill Road, Northampton—one Brantly B2B.

Court Line (Aviation) Ltd Luton Airport, Bedfordshire—one JetRanger.

E. Day 41 Carlton Terrace, Swansea—one Brantly B2A.

Dean Aviation Ltd c/o Spicer & Pegler, St Mary Axe House, London EC2—one Brantly B2B.

Decca Navigator Company 247 Burlington Road, New Malden, Surrey—one Bell 47G.

Endeavour Aviation Ltd 88-90 Preston Road, Brighton 6, Sussex—one JetRanger.

R. H. Everett Paulton House, Ower, Hampshire—one Brantly B2A.

Fairoaks Aviation Ltd Fairoaks Aerodrome, Woking, Surrey—one JetRanger.

Farmair Ltd Thrupton Aerodrome, Wiltshire—one Bell 47D.

Federated Design and Building Group Federated House, London Road, Dorking, Surrey—one Enstrom F-28.

Ferranti Ltd Hollinwood, Lancashire—two JetRanger, one Westland Widgeon.

Film Flight Ltd Luton Airport, Bedfordshire—two Bell 47G.

E. C. Francis Watergate House, Watergate Street, Chester, Cheshire—one Brantly B2.

Freemans of Bewdley (Aviation) Ltd Astley Garage, Stourport-on-Severn, Worcestershire—one Brantly B2.

Gen-Avia Ltd Alexandra House, Alexandra Terrace, Guildford, Surrey—one A-B47G.

Globe Construction Co Ltd Globe House, Braintree Road, Felsted, Essex—one JetRanger.

The Profit Pair.



The Hughes 300-C.

Faster than the "B"—105 mph. A heftier hauler—41% more payload. Still a small spender, though. The 300s cost less to buy, fly and service than any other 3-place ship. A simple, rugged, foolproof machine for flight training, ag spray, charter trips and industrial use. We've learned to build it that way by building 1,600 others that have logged 2 million flight hours.

The Hughes 500.

Fastest light turbine you can buy—150 mph. Carries the most payload—1,450 lbs. And there's 42 cubic feet of cargo space, even with pilot and two passengers aboard. Easy maintenance: less than half an hour per flight hour. A Henry Dreyfuss-styled interior that looks good even after rough use. And the 500 has the options you want, like floats and cargo hook.

**Hughes makes the helicopters
that make money.**

DISTRIBUTORS: Germany: Rietdorf KG, Saffig; United Kingdom: Trans World Helicopters Ltd., London; Italy: Nardi S.A., Milan; Sweden: SAAB Aktiebolag, Norrköping; Switzerland: Deltra S.A., Geneva; Portugal: Aviber S.A.R.L., Lisbon; Spain: Georges De Sonchen, Madrid (commercial); Compania Aeronautica Espanola S.A., Madrid (government); Republic of the Congo: Air Brousse S.P.R.L., Brussels; Republic of South Africa: Commercial Air Services (Pty.) Ltd., Johannesburg; Kuwait: Specialties Company W.L.L., Kuwait; Lebanon: Bardawil & Co., Beirut; Australia: Commonwealth Aircraft Corp. Pty., Melbourne; Republic of China: China Trade & Development Corp., Taipei; India: Cambata Aviation Private Ltd., Bombay; Japan: Toyo Menka Kaisha, Ltd., Tokyo; Kawasaki Heavy Industries, Aircraft Div., Tokyo; New Zealand: Dalhoff & King, Ltd., Wellington; Philippines: Lane International, Inc., Manila; Singapore: MacLaine, Watson & Co., Singapore; Thailand: L. A. Lewis, Inc., Bangkok; Argentina: Cygnus S.A.O.I., Buenos Aires; Brazil: S.A. De Comercio Tecnico Aeronautico, Rio de Janeiro; Chile: Aeroservicio Limitada, Santiago; Colombia: Aero-Merchantil Limitada, Bogota; Ecuador: General Victor Suarez, Quito; Mexico: Compania Mexicana Aerofoto S.A., Mexico, D.F.; Nicaragua: Roger Blandon V., Leon; Panama: Agencia Peters, Panama; Puerto Rico: Dupre Air Activities, Inc., Mayaguez; Uruguay: Aviansa, Montevideo; Bolivia: Oil Industry Supply & Service Co., S.A., La Paz; Peru: Aeronautica S.A., Lima; Venezuela: Aviacion General S.A., Caracas; Canada: Heliolair, Ltd., Montreal.

The KA-26 General Duty 'Copter

The U.S.S.R. KA-26 helicopter is a multi-purpose coaxial machine, well-tested in all forms of agricultural, forestry, construction and transportation duty.



The KA-26 coaxial combines trimness and compactness with a high-load ratio, responsive handling and easy manoeuvrability.

Maximum take-off weight	3,250 kg.	Flying range without auxiliary fuel reserve (30 minutes' flight)	530 km. (329 m.)
Maximum payload	900 kg.	Passenger capacity	7 people
Weight of load transportable on external slings	900 kg.	Engines	2 piston units, M-14B-26
Maximum level-flight speed	170 km/h (105.6 mph)	Take-off power	2 x 325 h.p.

Full information and specifications on the helicopter are obtainable on request from the sole exporters:

V/O "AVIAEXPORT"

MOSCOW G-200, U.S.S.R.
CABLES: AVIAEXPORT MOSCOW.
TELEPHONE: 244-26-86. TELEX: 257.

WORLD HELICOPTER MARKET ...

Gregory Air Services Ltd Denham Airfield, Uxbridge, Middlesex—one Alouette II, one Hughes 269A, two Hughes 500.
Hambro's Bank Ltd 41 Bishopsgate, London EC2—one JetRanger.
Helicopter Services Ltd Luton Airport, Bedfordshire—one Bell 47D.
Heli-Union (UK) Ltd 4 Yeoman's Row, London SW1—one Alouette II, two Alouette-Astazou.
P. W. Hicks Holme, Mannings Heath, Horsham, Sussex—one Hiller UH-12.
Kebbell Developments Ltd Carpenders Park, Watford, Hertfordshire—one Brantly B2B.
Management Aviation Ltd Bourn, Cambridgeshire—four Hiller UH-12.
Alan Mann Racing Ltd Fairbairns Aerodrome, Woking, Surrey—one Bell 47G.
Sir Robert McAlpine & Sons Ltd Luton Airport, Bedfordshire—one JetRanger.
K. McDonald Malton Lodge, High Malton, Doncaster, Yorkshire—one Bell 47G.
Overhill Estates Ltd Chatsgrave, Bolney, Sussex—one JetRanger, one A-B47J.
Point to Point Helicopters Ltd Leavesden Aerodrome, Watford, Hertfordshire—one JetRanger.
Port of Bristol Authority Queen Square, Bristol 7—two A-B47J.
Reed Helicopters Ltd 6 Highfield Close, Southampton, Hampshire—one Hughes 269A.
C. E. Rose Pinewood, The Chase, Woburn Common, High Wycombe, Buckinghamshire—one Brantly B2B.
Royal Air Force Whitehall Gardens, London SW1—100 Whirlwind HAR.10, 70 Wessex HC.2, two Wessex HCC.4, 12 Westland Sioux HT.2, six Sycamore HR.14. On order: 40 SA.330 Puma, 25 Westland WG.13.
Royal Navy Fleet Air Arm Whitehall Gardens, London SW1—20 Westland Sea King HAS.1, 150 Wessex HAS.1/HAS.3/HU.5, 90 Wasp HAS.1, 30 Whirlwind HAS.7/HAR.9, 13 Hiller HT.1, 20 Westland Sioux. On order: 40 Sea King HAS.1, 100 Westland WG.13.
H. J. Ryman 40 Clipstone Street, London W1—one Hughes 269B.
Samuelson Aviation Ltd Samcine House, 303 Cricklewood Broadway, London NW2—one Alouette-Astazou, one Bell 47G.
Shackleton Aviation Ltd 170 Piccadilly, London W1—one Hughes 269B.
A. Smith (Colceth) Ltd 38 Bond Street, Leigh, Lancashire—one Brantly B2B.
Major M. Somerton-Rayner Army Aviation Centre, Middle Wallop, Hampshire—one Saro Skeeter.
South Western Electricity Board Electricity House, Colston Avenue, Bristol—one JetRanger, one A-B47J.
Start Hill Brickworks Ltd Dunmow Road, Bishops Cleeve, Essex—one JetRanger.
Stewart Smith & Co 1 Seething Lane, London EC3—one JetRanger.
Sunderland Print Ltd Forge Lane, Halesowen, Worcestershire—one Brantly B2B.
John Sutcliffe & Sons Ltd East Side, Royal Docks, Grimsby, Lincolnshire—one Brantly B2A.
Tradewinds Airways Ltd Gatwick Airport, Horley, Surrey—one JetRanger.
Turriff Construction Corporation Turriff Building, Great West Road, Brentford, Middlesex—one Brantly B2B.
Twyford Moors Helicopters Ltd Southampton Heliport, West Quay Road, Southampton, Hampshire—three Hiller UH-12, three Hughes 269A, one A-B47G, one A-B47J.

United Marine (1939) Ltd 3 Southwark Street, London Bridge, London SE1—two JetRanger.
R. A. Wale 15 Trumpington Road, Cambridge—one Alouette II.
F. J. Wallis Stoneyhills House, Great Witley, Essex—one Brantly B2B.
Westland Aircraft Ltd Yeovil, Somerset—four Widgeon.
John Willment Properties Ltd 161 Chertsey Road, Twickenham, Middlesex—one Brantly B2B.

UNITED STATES—ALABAMA

Alabama Institute of Aviation Technology PO Box 1088, Ozark—one Bell 47D.
Bell Helicopter Service PO Box 42A, Enterprise—two Bell 47G.
Bobell Helicopter Service PO Box 363, Union Springs—one Hughes 269A.
Casey Enterprises Inc PO Box 1069, Birmingham—one Brantly B2.
E. H. Darby and Company Box 471, Sheffield—one Bell 47B, one Bell 47G, one JetRanger.
Dothan Aviation Corporation Wheelless Airport, Dothan—one Bell 47G.
M. A. Harrison Manufacturing Company Edison Highway, Birmingham—one JetRanger.
Redi-Copters Inc Box 457, Atmore—one Bell 47D, one Bell 47G.

ALASKA

Afton Flying Service Inc Box 617, Sitka—one Bell 47G.
Alaska Air Guides Inc PO Box 4165, Spenard—one Bell 47G.
Alaska Helicopters Inc PO Box 6283, Anchorage—three FH-1100, two Bell 47J, two Bell 47G, three Hiller UH-12E.
Anchorage Helicopter Service Inc 1812 East Fifth Avenue, Anchorage—two Sikorsky S-62A, three Bell 205A, six JetRanger, five Bell 47J, seven Bell 47G.
Arctic Air Services Inc PO Box 6227, Anchorage—two FH-1100.
Aviation Contractors Inc 2408 Fifth Avenue, Anchorage—one Bell 47G.
City Electric Inc PO Box 3698, Anchorage—one JetRanger.
Era Helicopters of Alaska Inc PO Box 762, Anchorage—one Sikorsky S-62A, three Bell 205A, two Bell 204B, three Sikorsky S-55, three JetRanger, four Bell 47J, two Bell 47G, one Hiller UH-12E.
B. C. Hamilton 508 Sixth Avenue, Anchorage—one Bell 47G.
Jet Choppers Inc PO Box 1393, Fairbanks—two Bell 205A, three JetRanger.
Johnson Helicopter Service Inc PO Box 578, Anchorage—one Hiller UH-12E.
Kenai Air Service Inc PO Box 232, Kenai—four JetRanger, one Bell 47J, one Bell 47G.
F. M. Lindsey and Associates PO Box 4081, Anchorage—one Hiller UH-12E.
Livingston Copters Inc PO Box 1468, Juneau—one Alouette II, four Hiller UH-12E.
R. Locke Jacobs 248 Fourth Avenue, Anchorage—one Bell 47G.
Merric Inc PO Box 3149, Fairbanks—one FH-1100, five Hiller UH-12E, one Hiller UH-12C.
Bill Moore Air Service Anchorage—one Hughes 269A.
Pease-Hamilton Helicopters Inc PO Box 6432, Anchorage—one Bell 205A, two Bell 204B, one JetRanger.
Temco Helicopters Inc PO Box 57, Ketchikan—four Hiller UH-12E, one Hughes 269.
Tundra Copters Inc 322 Tenth Avenue, Fairbanks—one Bell 47J, two Bell 47G.
Wien Consolidated Airlines Inc Box 3009, Fairbanks International Airport—one Bell 47D.

ARIZONA

AIR Research Manufacturing Corporation Phoenix—one Enstrom F-28A.
Arizona Helicopters Inc PO Box 885, Chandler—one Bell 205A, four JetRanger, two FH-1100, 16 Bell 47G.
Aviation Specialties Inc 4930 East Falcon Drive, Mesa—one Sikorsky S-55T, two S-55B.
Cutter Aviation Inc 2451 East Buchanan, Phoenix—one Hughes 269A.
Country Boys Aerial Applications Route 1, Box 90, Tolleson—one Bell 47G.
Arthur M. Doan 300 Arroyo Boulevard, Nogales—two Bell 47G.
Garrett Corporation Phoenix—one Hughes 269A.
Gay Airways Inc 2919 North 36th Street, Phoenix—three Bell 47G.
Grand Canyon Helicopters PO Box 51, Grand Canyon—one JetRanger, one Bell 47B, two Hiller SL4, one Hughes 269.
Halvorson-Lent Transcanyon PO Box 455, Grand Canyon—two JetRanger, three Bell 47G.
Intermountain Aviation Inc Marana Air Park, Marana—one JetRanger, four Bell 47G.
Kellair 5314 North 69th Place, Paradise Valley—one Hughes 269A.
KOOL Radio Phoenix—one Hughes 269A.
Madison Aviation Inc 2301 North Greenfield Road, Falcon Field, Mesa—one Bell 47J, six Bell 47G, one Hughes 269A.
Marsh Aviation Inc Box 653, Litchfield Park—one Bell 47G.
Robert Murray 2411 Airline Way, Phoenix—one Bell 47G.
Page Aviation Box 625, Page—one Bell 47G.
Roberts Aircraft Company 6720 East Bluebird, Scottsdale—three Hiller UH-12E, one Bell 47G.
Saguaro Aviation Inc 2635 Airline, Phoenix—two Bell 47G.
Scottsdale Aviation Inc Box 156, Scottsdale—one JetRanger, one Bell 47G.
Southwest Airlines Inc Box 537, Grand Canyon—one JetRanger, one Bell 47G.
US Department of the Interior Bureau of Reclamation, PO Box 6457, Phoenix—one JetRanger, one Bell 47G.
Vanderer Inc 7447 West Reade Avenue, Glendale—five Brantly B2.

ARKANSAS

Bunge Corporation Box 827, West Memphis—one Bell 47J, one JetRanger.
Director of Civil Defence Little Rock—one Hiller UH-12A.
Helicopters Inc Little Rock—four Hughes 269A.
L. R. Luker 1 Edenwood, North Little Rock—one Brantly B2.
H. C. Palmer Box 336, Harrisburg—one Brantly B2.
Security Crop Care Inc Box 484, West Memphis—one Bell 47D.
Southern Helicopter Services Inc PO Box 86, Little Rock—two Brantly B2.
K. Starnes Aviation Services Inc PO Box 2534, Little Rock—one Hughes 269A.

CALIFORNIA

ABC Helicopter Service 2901 East Spring, Long Beach—one Bell 47D.
ABC Helicopter Service 4341 West Commonwealth, Suite E, Fullerton—one Bell 47D.
A & K Helicopters Inc 310 Maple Street, Shafter—three Bell 47G, one Bell 47D.
Ace Helicopter Wreckers Inc 2312 Duane Street, Los Angeles—one Bell 47D.
Aerial Crop Service 2386 Palomar Airport Road, Carlsbad—one Bell 47D.
Aerospace Leasing Corporation 4340 Campus Drive, Newport Beach—one FH-1100, two Bell 47G.
Aetna Helicopters Inc PO Box 426, Etna—two Alouette, three Hiller UH-12E.

WORLD HELICOPTER MARKET...

- Agri-Fly Inc** Po Box 494, Terra Bella—one Bell 47G.
- Air West Inc** 2627 Hollywood Way, Burbank—one Bell 47G.
- Aircroft Transport Inc** 411 South Batavia, Orange—one Bell 47G.
- Aircraft & Helicopter Supplies Inc** PO Box 326, Sun Valley—one Bell 47J, three Bell 47G, eight Bell 47D.
- Amicorp Industrial Leasing Company** Alhambra—one Hughes 269A.
- American Helicopter Service Inc** Orange County Airport, Santa Ana—one Bell 47D.
- American Investments Inc** 4145 Ann Arbor Road, Lakewood—20 Piasecki HUP.
- Charlie Angal** 300 Faber Street, Shafter—one Bell 47G.
- Astro Copters Ltd** Box 23584, Pleasant Hill—two Bell 47G.
- Atwood Aviation Inc** PO Box 2174, Salinas—three Bell 47G.
- Aztec Aircraft Corporation** 4225 Donald Douglas Drive, Long Beach—two Hughes 269A.
- Bank of America** Los Angeles—one Hughes 269A.
- A. W. Bayer & Associates** Palos Verdes—one Hughes 269A.
- Bell Helicopter Company** 2211 North Hollywood Way, Burbank—one Bell 47J, two Bell 47G.
- Bell Aircraft Sales** 7022 Mayflower, Bell—two Bell 47G.
- Bird & Sons** 425 California Street, San Francisco—one JetRanger, one Bell 47G.
- Blue Helicopters** 620 Airport Boulevard, San Carlos—two Hughes 269A.
- Joseph E. Bogar** Alameda—one Hughes 269A.
- R. L. Bottimore Galt**—one Hughes 269A.
- J. G. Boswell Company** PO Box 877, Corcoran—one Bell 47G.
- Bradford Laws and Weatherly** 864 Washington Street, Hollister—one Bell 47B.
- Lilburn H. Brand** Taylorsville—one Hughes 269A.
- Belles Helicopter Service** 3011 Airport Avenue, Santa Monica—one Bell 205A, one Vertol V42, one Bell 47J, one Bell 47G.
- British Motors of Monterey Inc** Monterey—one Hughes 269A.
- Cable Flying Service Inc** 13th & Benson Streets, Upland—one Bell 47G.
- Cal Copters Inc** 1595 Lindbergh Street, Stockton—two FH-1100, five Bell 47G.
- California Airways** 1164 West A Street, Hayward—one Bell 47G.
- California Ambulance Service** 3118 Santa Monica Boulevard, Santa Monica—one Bell 47.
- California Highway Patrol** San Francisco—three FH-1100.
- California Institute of Technology** Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena—two Bell 47J.
- California Land & Investment Company** 2761 Hollywood Way, Burbank—one JetRanger.
- Cal Land Investment Company** 5670 Wilshire Boulevard, Los Angeles—one JetRanger, one Bell 47J.
- Cal-Nat Airways (Aerolift)** Loma Rica Airport, PO Box 1017, Grass Valley—three Bell 47G.
- Cal-Western Aero Service** PO Box 6007, Bakersfield—one Bell 47D.
- Carlos E. Camacho** 7635 Tobias, Van Nuys—one Brantly B2.
- Caribbean Copters** San Jose—two Hughes 269.
- Raymond Castamchoa** McFarland—one Hughes 269A.
- Chaffey Junior College District** 5885 Haven Avenue, Alta Loma—one Bell 47E.
- City of Lakewood**—four Hughes 269.
- City of Long Beach**—one Hughes 269.
- City of Santa Monica**—two Hughes 269.
- Clevenger Inc** 785 Monterey Road, Salinas—three Hiller UH-12C.
- Coast Copters** PO Box 913, Tarzana—one Bell 47D.
- Harry Chon** Beverley Hills—one Enstrom F-28A.
- Columban Company** 9229 Sunset Boulevard, Los Angeles—one Bell 47G.
- William Comenzind** Manteca—one Hughes 269A.
- Commodore Helicopters Inc** 240 Redwood Highway, Marin County Airport, Mill Valley—two Hughes 269.
- Condor Helicopters & Aviation Inc** PO Box 3356, Ventura—three FH-1100, two Bell 47G.
- Consolidated Helicopters Inc** 13766 Bayliss Road, Los Angeles—two Bell 47G.
- Continental Vortex Inc** 2805 Woodshire Drive, Hollywood—one Bell 47D, three Bell 47G, one Hiller UH-12E.
- Copter Inc** 2386 Palomar Airport Road, Carlsbad—one Bell 47G.
- Copter Transit Inc** Los Angeles—one Hughes 269.
- Coronado Helicopters** Box 8401, Universal City—two Bell 47G.
- Cosmodyne Corporation** 2920 Columbia Street, Torrance—one Bell 205A.
- J. V. Crawford** San Ynez—one Hughes 269A.
- Crownair Inc** 3980 West Aero Way, San Diego—two Bell 47G, one Brantly B2B.
- Davis Dusters Inc** PO Box 28, Colusa—one Hiller UH-12C.
- Del Mar Engineering Laboratories** 6901 Imperial Highway, Los Angeles—one JetRanger, one Hughes 269.
- Jeff Dennis** 319 MacArthur Boulevard, San Leandro—one JetRanger.
- Gene Dezan** Blythe—one Hughes 269A.
- Diversified Opportunities Corporation** 16800 Roscoe Boulevard, Van Nuys—one JetRanger.
- Donald A. Dowell & Company** 7022 Mayflower Avenue, Bell—one Bell 47G.
- Duschaks Helicopter Rotor Service** 22587 S. Western Avenue, Torrance—four Hiller UH-12C.
- Dynaero Inc** 8871 Balboa Avenue, San Diego—two Hughes 269A.
- English Mountain Ranch** PO Box 950, Grass Valley—one Bell 47G.
- Eureka Aero Industries Inc** Eureka—one Hughes 269.
- Executive Air Service** Orange County Airport, Santa Ana—two JetRanger.
- Executive Helicopters Inc** 2761 Hollywood Way, Burbank—two Bell 47D, three Bell 47G.
- Francha Enterprises Inc** 2801 E. Spring Road, Long Beach—one Vertol H-25, 15 Piasecki, one Sikorsky S-58, six Sikorsky S-55, one Bell 204B, one Bell 47D, one Hiller UH-12B.
- Fresno Helicopters Inc** 4711 North Brawley, PO Box 5009, Fresno—two Hiller UH-12B.
- Byron L. Fry** Los Angeles—one Hughes 269.
- Frank Gargon** 2018 Beecham Drive, San Pedro—one Bell 47G.
- Gray Helicopters Inc** Santa Monica—one Hughes 269A.
- Greenhaw Helicopters** 935 W. Alamos, Clovis—one Hiller UH-12E.
- Gregg Electric Inc** 608 West Emporia, Ontario—one Bell 47G.
- H & H Supply** Seaside—one Brantly B2.
- Hallbeck Helicopters** 364 Pine Hill Road, Mill Valley—one Hughes 269A, one Bell 47G.
- G. Allen Hancock** 3325 Wilshire Boulevard, Los Angeles—one Bell 47G.
- Archie Hanson Jr** Paso Robles—one Hughes 269A.
- Hawaiian Helicopters Inc** 22 Terra Vista, San Francisco—one Hiller UH-12E.
- Hayden Helicopters** 32625 Avenue 176, Porterville—one Hiller UH-12E.
- Helibirds** San Diego—two Hughes 269.
- Helicabs Inc** 10889 Wilshire Boulevard, Los Angeles—two Bell 47J.
- Helicopter Applicators Inc** 10453 N. Russell Road, Firebough—one Hughes 269A, one Kitzkooper Mini Bell.
- Helicopter Center** 7120 Hayvenhurst, Van Nuys—one Bell 47G.
- Helicopter Mechanics Service** 7826 Sepulveda Boulevard, Van Nuys—one Bell 47G.
- Helicopters of San Jose Inc** 1101 Airport Boulevard, San Jose—one Hughes 269, two Bell 47G.
- Helicopters International Inc** Hangar 3, Lockheed Air Terminal, Burbank—six Hughes 269, one Hiller UH-12E.
- Rowland F. Henry** PO Box 375, Gonzalez—one Bell 47G.
- Jim Hicklin Helicopters Inc** 28035 Ermine Street, Saugus—one Bell 47D.
- Hollywood Television Helicopters Inc** 6144 Linforth Drive, Hollywood—three Bell 47G, one Hiller UH-12E.
- Hughes Aircraft Company** Culver City—one Hughes 269B, one Bell 47J.
- Hughes Tool Company** 2386 Palomar Airport Road, Culver City—seven Hughes 500, 10 Hughes 269B, 16 Hughes 269A.
- Paul C. Huston** 3110 Del Rosa Avenue, San Bernardino—one Bell 47D.
- Hylton Drilling Company** 308 Brink Drive, Bakersfield—one Hughes 269A.
- Inter-City Airways Inc** 6300 E. Telegraph Road, City of Commerce—one Bell 47J.
- International Helicopters Inc** 22593 South Western Avenue, Torrance—three Hiller UH-12E.
- C. T. Jensen** 6250 Freeport Boulevard, Sacramento—one Hughes 269, two Hiller UH-12, two Alouette.
- Charles R. Johnson** Highland—one Hughes 269.
- Richard I. Johnson** Route 1, Paso Robles—one Bell 47G.
- Jori Helicopter Service** Municipal Airport, Ukiah—one Bell 47G.
- Jule Executive Transport Inc** PO Box 1414, Torrance—one Hughes 269.
- James W. Keeney** Santa Barbara—one Hughes 269A.
- Kenifex Chemicals Inc** Los Angeles—one Hughes 269A, on order: one Hughes 500.
- Kern Aircraft Inc** Bakersfield—one Hughes 269.
- Warne H. Kerr** Vacaville—one Hughes 269A.
- KMPC Radio** 5939 Sunset Boulevard, Los Angeles—one JetRanger, one Bell 47G, one Bell 47H.
- Henry F. Kroll** Box 197, Seldovia—one Bell 47G.
- KTLA-TV** Los Angeles—one JetRanger.
- Anthony P. La Bella** 1290 Lakehurst Street, Simi—one Bell 47G.
- James A. Lasley** 7622 Camellia, Los Angeles—one Bell 47D.
- Garwood J. Leslie** San Clemente—one Hughes 269A.
- Leslie Leasing Company** Los Angeles—one Hughes 269A.
- L'n O Aerial Applicators** 1105 West Alisal Street, Salina—one Bell 47G.
- Litton Engineering Laboratories** English Mountain Ranch, Grass Valley—one Bell 47G.
- Los Angeles Air Taxi Service** 3200 Airport Avenue, Santa Monica—one Bell 47H.
- Los Angeles Airways Inc** PO Box 90155, Los Angeles—four Sikorsky S-61L, two Sikorsky S-55, one S-51.

MBB European Partner of British Aerospace Industry



The BÖLKOW BO 105 – first light helicopter in the world with two engines and the BÖLKOW SYSTEM rigid rotor – is designed as a truly versatile machine.

Two Allison 250 C-18 gas turbines give the BO 105 high power reserves and represent an unbeatable safety factor.

Optimum flight behaviour and a wide c.g. range are ensured by the BÖLKOW SYSTEM rigid rotor, which consists of a titanium rotor head and four glass-fibre reinforced plastic blades.

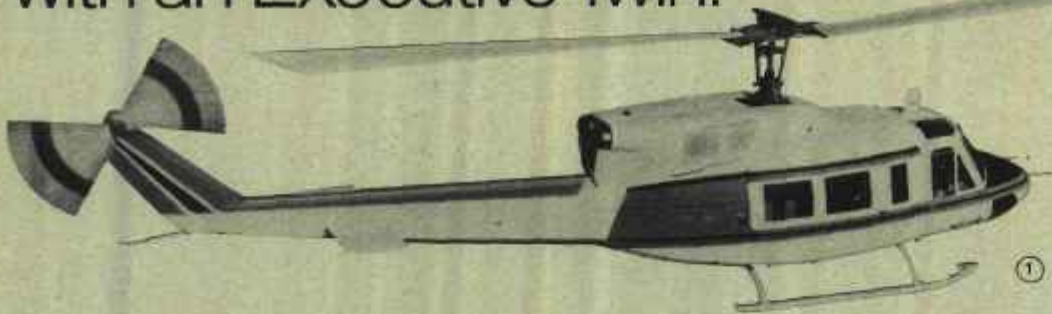
Spacious cabin – large cargo or stretcher compartment with rear loading doors – high set tail rotor – all weather and IFR capability – and a complete range of optional equipment for every type of operations.

Added together, these features complete the picture of a helicopter which is successfully opening up new operational possibilities for the seventies.

MBB

MESSERSCHMITT-BÖLKOW-BLOHM
Helicopter Division
Munich-Ottobrunn

Bell...First in the air with an Executive Twin!



Bell makes more helicopters than anyone else in the world. And Bell alone offers a full line of models to perform the most complete range of commercial rotorcraft tasks.

This leadership aloft begins with leadership on the ground: in the dreaming room, at the drawing board, in the lab. A leader leads. And so again in 1970 as through the many years till now, there will be more Bells aloft, more models to do more tasks, and more performance from them all, from Bell, the leader.

1 THE 1970s BEGIN WITH BELL'S BRILLIANT NEW TWO-TWELVE TWIN. Never till now a vehicle like this. New dependability from twin-turbine engines, new high performance, new comfort, new convenience: powered by an 1800 H.P. Pratt & Whitney twinpack, the Two-Twelve provides faster door-to-door transportation up to 300 miles than any other ground-air combination.

2 THE MIGHTY 205A. Proven by over 7500 military and commercial craft in this series, it is perhaps the most flexible business-industrial craft ever produced. The 1400 H.P. Lycoming turbine powered 205A is a busy air taxi, a mover of people and cargo over cities, in multi-plant complexes, over swamps, mountains, forests and into remote areas, adapts readily to virtually limitless cabin arrangements. It can carry up to 14 passengers and a pilot, 5000 pounds of external sling, or 4000 pounds in the big 200-cu.-ft. cabin. The mighty 205A is the everything craft.

3 THE SLEEK JETRANGER. SPORTY TRUCK OR HARD-WORKING CHARIOT? The exciting 317 H.P. General Motors turbine-powered JetRanger is personal vehicle for numerous corpo-

rate officers, police-vehicle, off-shore oil rig worker, helicab — and the fastest selling light turbine helicopter on earth. Eliminates ground snarls from city to city travel, makes corporate jet fleets more useful — and is by far the most beautiful craft of its kind. 140-mph, five places in comfort, 1200 pounds carried externally, 950 inside.

4 THE INTREPID AgMASTER. Its formal name, the 47G-5, identifies it as one of the famous Bell 47s, of which there are still more flying than any rotorcraft of any maker. AgMaster far outworks fixed-wing craft, eliminates turn time, cuts refill time to almost nil, needs no runway — and almost instantly converts to handle any number of other chores from cargo hauling to personnel moving. Easy to fly, inexpensive to buy and to operate.

5 PATROL CAR 47. Low cost, brilliant airworthiness, ease of handling, and availability of many options, make the 47 ideal for police and other public assignments. When "Car 47" is on duty aloft, the fight on the ground is over. Off duty, the car serves as ready firewatch, ambulance, traffic director, or VIP cab.

For more information, see your Bell Dealer. Or write Vice President, International Marketing, Bell Helicopter, P. O. Box 482, Fort Worth, Texas 76101.

BELL HELICOPTER

A **Textron** COMPANY

P. O. BOX 482
FORT WORTH, TEXAS 76101



WORLD HELICOPTER MARKET...

Los Angeles County Forestry Department PO Box 3009, Terminal Annex, Los Angeles—one JetRanger, one Bell 204B, two Bell 47G.

Los Angeles Department of Transportation—two Bell 47G, two Bell 47J.

Los Angeles Fire Department 7921 Woodley Avenue, Van Nuys—two JetRanger, two Bell 47G.

Los Angeles Police Department 150 Los Angeles Street, Los Angeles—one JetRanger, eight Bell 47G.

Los Angeles Sheriffs' Department Hall of Justice, Los Angeles—five Hughes 269 floatplanes, five Bell 47G.

Los Angeles Supplies Department City Hall, Los Angeles—one JetRanger.

M & W Flying Service Inc 9372 Avenue 132, Porterville—one Bell 47G.

Macco Realty Company PO Box 2175, Newport Beach—one Bell 47J, one JetRanger.

Carroll M. Martensen 1900 Ransom Road, Glendale—one Bell 47G.

McDonnell Douglas Corporation 3855 Lakewood Boulevard, Long Beach—two JetRanger.

McKnight Construction Company Box 398, Baldwin Park—one Brantly B2.

Meade Helicopters PO Box 751, Porterville—three Hiller UH-12, one Hiller SL4.

Merced County Mosquito Abatement District 3478 Beachwood Drive, Merced—one Bell 47G.

Mercury General American Corporation 430 Castle Place, Beverly Hills—two Alouette II, two Bell 47G, two Bell 47J.

Montgomery Helicopters 1912 Ninth Avenue, Delano—one Bell 47D, one Hughes 269.

Joseph E. Murphy Chatsworth—one Hughes 269.

John W. Myers Merced—one Hughes 269.

National Air College Montgomery Field, San Diego—four Hughes 269.

National Helicopter Service and Engineering Company 16800 Roscoe Boulevard, Van Nuys—one Sikorsky S-55, two JetRanger, one Bell 47D, 15 Bell 47G, three Bell 47J.

A. L. Newman PO Box 482, Kelseyville—two Bell 47D.

Newport Construction Company 4500 Campus Drive, Newport Beach—one Bell 47G.

Bass Eric Newton Long Beach—one Hughes 269A.

North American Rockwell Corporation 1700 East Imperial Highway, El Segundo—four JetRanger.

Northern Helicopters Porterville—one Hughes 269A.

Onstott Dusters Yuba City—one Bell 47G.

Pacific Airmotive Corporation 3000 N Clybourn Avenue, Burbank—two Enstrom F-28A.

Pacific Southwest Airlines 3100 Goddard Way, Lindbergh Field, San Diego—two Brantly 305, one Brantly B2B, two Bell 47G.

Palm Springs Aviation Inc 2763 East Alejo Road, Palm Springs—one JetRanger, one Bell 47G.

Arthur E. Parker Sea Beach—one Hughes 269.

Pascoe Steel Corporation 1301, East Lexington Avenue, Pomona—one JetRanger.

M. J. Pearson Palos Verdes—one Hughes 269.

Peninsula Aviation 2955 Airport Drive, Torrance—one Hughes 269.

Petan Company PO Box 390, Santa Barbara—one Bell 47G.

Peterson Tractor Company 995 Marine Boulevard, San Leandro—one JetRanger.

James R. Pfeiffer 4340 Campus Drive, Newport Beach—one FH-1100, two Bell 47G.

Pine Belt Helicopters PO Box 725, Placerville—three Bell 47G.

Pomona Equipment Company 3369 West Pomona—one Bell 47G.

Dana Pratt Corona—one Hughes 269.

Progressive Aviation Reid Hillview Airport, San Jose—one Hughes 269, one Hiller UH-12E.

Puente Ready Mix Inc 209 North California Avenue, City of Industry—two Brantly B2.

Quality Helicopters 8122 Genesta Avenue, Van Nuys—one Bell 47G.

The Quinn Company PO Box 1786, Fresno—one JetRanger.

RC Helicopter Service PO Box 221, Goleta—one Bell 47G.

Radakovich Construction Company 2361 East Lynwood Drive, Longview—one Hughes 269A.

Grady Ragsdale 336 South 8th Street, Santa Paula—one Bell 47G.

Raye Helicopters Inc 1621 Tollhouse Road, Clovis—one FH-1100, three Hiller UH-12E, one Hiller UH-12B.

George L. Raymond Lawndale—one Hughes 269A.

Ready Air Services PO Box 57, Rough and Ready—one Bell 47G.

Red Bluff Air Service PO Box 308, Red Bluff—two Bell 47D, four Bell 47G.

Redding Air Service Inc Box 4244, Redding—four Bell 47G.

Redding Helicopters Inc Redding—one Hughes 269.

Cyrus L. Rhoades 2816 Becerra Way, Sacramento—one Bell 47G.

Rick Helicopters Inc 931 American Street, San Carlos—four Bell 47G, four Bell 47J, two Hiller UH-12E.

RMAC Air Corporation Santa Ana—one Hughes 269.

Robinson Helicopters Inc 8787 Shoreham Drive, Los Angeles—one Bell 47G, two Hughes 269.

Rocky Rotors Inc 7323 Yarmouth Avenue, Reseda—two Bell 47G.

Rodell Investments Inc 5623 Peck Road, Arcadia—one Bell 47G.

Rogers Helicopters PO Box 4, Clovis—one JetRanger, two Bell 47G, one Hiller UH-12E, two Hiller SL4.

Dr Mason Rose 1312 North Stanley Avenue, Los Angeles—one Brantly B2.

Rotor-Aids Offshore Inc PO Box 1238, Ventura—two Sikorsky S-55, two JetRanger, three Bell 47J, one Bell 47G.

San Bernardino Junior College 701 South Mount Vernon Avenue, San Bernardino—one Bell 47D.

San Francisco and Oakland Helicopter Airlines PO Box 2525, Oakland—five Sikorsky S-61N, one S-62A.

San Joaquin Helicopters Inc PO Box 715, Shafter—one Bell 47G.

Santa Barbara Aviation Inc PO Box 296, Goleta—four Hughes 269A, one Hughes 269B.

Santa Monica Aviation Inc 3011 Airport Avenue, Santa Monica—one Bell 47D, one Hughes 269A.

Santa Monica Flyers 2500 Airport Avenue, Santa Monica—one Bell 47D.

SanTana Helicopter Service Inc Orange County Airport, Santa Ana—two Bell 47D, two Bell 47G.

Eric Scarlitt PO Box 85, Carmel Valley—one Brantly B2.

John E. Shell 7323 Yarmouth Avenue, Reseda—one Bell 47G.

Shepherd Machinery Company PO Box 6789, Los Angeles—one Hughes 269A.

Robert Schultz 3814 Lenawee Avenue, Culver City—one Bell 47J.

Schultz Enterprises Inc 3249 South La

Cienega Boulevard, Los Angeles—eight Bell 47G, one Bell 47J.

Sea-Air Inc Long Beach—one Hughes 269A.

Shasta Helicopters Inc PO Box 50, Porterville—two Bell 47G, nine Hiller UH-12.

Sierra Aviation Box 751, Porterville—one FH-1100, two Bell 47G, four Hiller UH-12E.

Signal and Airwatch Inc 4561 Empire, Burbank—one Bell 47H, one Bell 47G, one Bell 47J.

Skyline Helicopters Inc 18741 North Airport Way, Orange County Airport, Santa Ana—two Hughes 269, one Bell 47J.

Charles T. Smith 1340 West Princeton, Ontario—one Bell 47G.

Southern California Edison Company 3710 Artesia Avenue, Fullerton—one Bell 47G, two Hiller SL4, one Hiller UH-12E.

Southern Cal Helicopters Paramount—one Hughes 269A.

Southland Helicopters Inc 3205 Lakewood Boulevard, Long Beach—two Hughes 269A, four Hughes 269B.

Strecker Equipment Company Long Beach—one Hughes 269A.

Sutter Butte Dusters Inc PO Box 213, Live Oak—one Bell 47G.

Tallmante Aviation Inc Orange County Airport, Santa Ana—one Bell 47G.

Jack W. Thornburg Mesa Grande Route, Santa Ysabel—one Bell 47G.

Trans America Leasing Corporation 1150 South Olive, Los Angeles—one Bell 47G, one Bell 47J.

Tri County Copters PO Box 427, Monte Rio—one Hughes 269A.

Tri Financial Corporation San Diego—one Hughes 269A.

Tulare County Mosquito Abatement District PO Box 1476, Tulare—one Enstrom F-28A.

Tyler Helicopter Camera Systems 6335 Homewood Avenue, Hollywood—one Bell 47J, one Bell 47G.

United Helicopters Inc PO Box 528, Oroville—three Bell 47G.

United Helicopters Inc 2519 Airport Avenue, Santa Monica—one Bell 47G.

Universal Divers Ltd 607 S Park View Street, Los Angeles—one Sikorsky S-55, one Bell 47G.

Universal Leasing Inc 13610 Southwestern Avenue, Gardena—one Bell 47G.

University of California White Mountain Research Station, Bishop—one Hiller 12SL4.

Utility Helicopters Inc 3215 E Spring Street, Long Beach—one Bell 205A, one JetRanger, four Bell 47G, three Bell 47J.

Vaeth Aircraft Repair Service 13th and Benson, Upland—one Bell 47G.

Valley Crest Landscape Inc 7715 Burnett Avenue, Van Nuys—one Bell 47J.

Valley Crop Dusters PO Box 208, Westley—one Bell 47G.

Van Nuys Skyways 16700 Roscoe Boulevard, Van Nuys—one Bell 47G, one Hiller SL4, four Hughes 269.

Michele Van Vleck Sloughhouse—one Hughes 269A.

Varnell Associates PO Box 194, San Lorenzo—one Bell 47G.

Robert L. Vetter 215 East Kettleman Lane, Lodi—one Brantly B2.

Visco Flying Company Inc PO Box 68, Imperial—one Hiller UH-12C.

Waters Buick San Francisco—one JetRanger.

Waters Helicopter Corp Butler Aviation Building, San Francisco International Airport—two JetRanger, two Hughes 269A.

Western Commander Inc 2011 Airport Avenue, Santa Monica—one JetRanger.

West Side Helicopter Corp 1205 N Street, Newman—one Bell 47D.

Western Helicopters Inc PO Box 579, Rialto—10 Bell 47G.

WORLD HELICOPTER MARKET...

Whirlwind Helicopters Inc 5424 Perimeter Road E, Fresno—two Bell 204B, four Hiller UH-12E, one Hiller SL4.
Alie Wiesenanger Saratoga—one Hughes 269A.
Edward F. Wilkinson Monte Rio—one Hughes 269A.
Will Helicopter Operations Inc 425 Los Verdes Drive, Santa Barbara—one Bell 47G.
P. E. Yehner Helicopters 1049 Airport Drive, Upland—one Hughes 269A, three Hiller UH-12, one Bell 47G.
Yeager Construction Company PO Box 87, Riverside—one Hughes 269.

COLORADO

Ag Helicopters Inc Fort Collins—one Hughes 269.
Continental Aviation Company Broomfield—three Hughes 269.
Douglas Broadcasting Company (KHOW) Petroleum Club Building, Denver—one Bell 47G.
W. H. & Clara Dreier 174 West 28th Street, Durango—one Bell 47G.
Gates Rubber Company 999 South Broadway, Denver—one JetRanger.
Helicopter Sales Inc Aurora—one Hughes 269A.
Highway Department 4201 East Arkansas Avenue, Denver—one Bell 47G.
Mile-High Aviation PO Box 431, Rifle—two Bell 47G.
Nyla Dee Newbrough PO Box 1222, Durango—one Bell 47G.
Pease-Hamilton Helicopters Inc 1517 Denver Club Building, Denver—one Bell 205A, one JetRanger, two Bell 47G. On order: one Bell 212.
Public Service Corporation of Colorado PO Box 840, Denver—one Hiller UH-12.
Paul Redding 11720 West 24th Place Circle, Lakewood—one Bell 47G.
Rocky Mountain Helicopters Jefferson County Airport, Broomfield—one Hughes 269A.
Sky Choppers Inc PO Box 1222, Durango—four Bell 47G.
US Department of the Interior Bureau of Reclamation, 1200 South Rio Grande Avenue, Montrose—one Bell 47G.
Jack W. Weishart PO Box O, Brush—one Brantly B2B.

CONNECTICUT

Pat Arnold Flight School PO Box 10294, Elmwood—one Brantly B2.
Edward Balf Company 190 Huyshope Avenue, Hartford—one Bell 47G.
Bartlett Tree Company Stratford—one Bell 47G.
Theodore D. Bross Line Construction Company 175 Enfield Street, Hartford—one Sikorsky S-51.
D'Addario Construction Company 513 Boston Avenue, Bridgeport—one Bell 47G.
Department of Aeronautics Brainard Airport, Hartford—one Sikorsky S-51.
Department of Conservation 106 Street, Springfield—one Enstrom F-28A.
Frouge Construction Company 141 North Avenue, Bridgeport—one Bell 47H.
Adrian P. Golth Bridgeport—one Brantly B2.
New England Helicopter Airlines Inc 175 Enfield Street, Hartford—two Sikorsky S-51.
Nutmeg Airways Corporation PO Box 18, New Britain—three Bell 47G, one Bell 47J, Rasbach Photo Service Shelton—four Brantly B2.
Sikorsky Aircraft Stratford—one Sikorsky S-51, two Sikorsky S-62.
Ralph G. Thomas Orange—one Hughes 269A.

Angelo Tomasso Inc PO Box 76, New Britain—one Bell 47J, one JetRanger.
United Aircraft Corporation 400 Main Street, East Hartford—one Sikorsky S-62A.
Whitehouse Engineering Company Box 146, West Suffield—one Bell 47H.
World Wide Helicopters Inc 272 Naugatuck Avenue, Milford—three Sikorsky S-62A, two Sikorsky S-55, two Sikorsky S-58, five Bell 47G.

DELAWARE

Executive Air Fleet Corporation 229 S State Street, Dover—one Bell 206A.
Exploration Helicopters Inc 129 South State Street, Dover—one Bell 47G.

DISTRICT OF COLUMBIA

Air America Inc 815 Connecticut Avenue NW, Washington DC—five Bell 205, 24 Sikorsky S-58, 12 Bell 204B.
Department of the Interior C Street, Washington DC—one Hughes 269.
Pioneer Airlines Inc 1522 Wisconsin Avenue, Washington DC—one Bell 47J, one Bell 47G.
Fred Ward 6419 Dahlgren Road, Washington DC—one Hughes 269A.
Wilson Line of Washington Inc Pier of Main & N Street, SW Washington DC—one Bell 47G.

FLORIDA

Adventure Helicopters Inc 16900 Collins Avenue, Miami Beach—one Bell 47D, one Bell 47G, four Sikorsky S-52.
Aerobits International Inc PO Box 2403, Hialeah—one Sikorsky S-52.
Alco Helicopters Inc PO Box 1285, Lake Wales—three Bell 47G.
Angels Incorporated Peter-O-Knight Airport, Tampa—one Brantly B2.
Aviation Facilities Inc PO Box 2034, Miami—one Bell 47G.
Benn Hill Griffin Inc PO Box 127, Frostproof—one Bell 47G.
Bush Aviation Enterprises PO Box 1348, Dania—one Hiller UH-12A.
Cape Kennedy Helicopters PO Box 129, Cape Canaveral—one Brantly B2A, one Bell 47H.
Chenille and Carpet House Box 1117, St. Petersburg—one Brantly B2.
Christopher Disting Service 1900 NW Hale Avenue, Okeechobee—one Hiller UH-12A.
Citrus Helicopters Inc Box 244, Winter Garden—two Bell 47D, one Bell 47G, two El Tomcat Mk 5.
Consolidated Farms Inc Box 878, Deerfield Beach—one Brantly B2.
Consolidated Financial Corporation PO Box 153, Sebring—one Bell 47G.
Crescent Airways Inc North Perry Airport, Hollywood—five Bell 47G, four Bell 47J, one Sikorsky S-55.
Dade County Public Safety Department 1320 NW 14th Street, Miami—one Bell 47G.
Dean Helicopter Service Big Tree Road South, Daytona Beach—one Sikorsky S-58B, one Kaman HH-43, two Hiller H-32 Hornet, three Bell 47G.
Executive Helio Services Inc 335 West 54th Street, Hialeah—one JetRanger.
First National Bank of Fort Lauderdale PO Box 8009, Fort Lauderdale—one Bell 47G.
Florida Coleman Corporation 301 South Orlando Avenue, Orlando—one Brantly B2.
Florida Game and Fresh Water Fish Commission 2520 E Silver Springs Boulevard, Ocala—one Bell 47G.
Follin & Howard Inc Nox 138, Largo—one Bell 47G.
Roderick Fraser PO Box 656, Orange—one Bell 47G.
Grace Helicopters Inc 4846 Phillips Highway, Jacksonville 7—one Hughes 269.
Grove Associates Inc PO Box 471, Miami Springs—one Hiller UH-12A.

Loel Guinness Box 368, Boynton Beach—one Hiller UH-12E.
Helicopter Spray Inc PO Box 1105, Lake Wales—five Bell 47G.
Highland Helicopters Lake Placid—one Hughes 269A.
Helicopters of America Inc 313 North Monroe Street, Tallahassee—one Bell 47G.
L. G. Howe Inc 1466 NE 55th Street, Fort Lauderdale—one Bell 47J.
George Jannack Miami—two Hughes 269.
Kendall Flying School Inc Tamiami Airport, Miami—one Bell 47H.
King and Tennil Box S, Del Ray Beach—one Brantly B2.
Marvin Kohn Box 448, Miami Beach—one Hughes 269A.
Lakeland Flying Service Inc PO Box 2536, Lakeland—one Brantly B2B.
Leeward & Pfaff Company PO Box 1541, Ocala—one Brantly 305, two Brantly B2B.
Llangolen Farm PO Box 27, Ocala—one JetRanger.
Maggie Valley Helicopters Inc 19115 Collins Avenue, Miami Beach—one Hiller UH-12.
Robert Malcolm Jr 232 Howard Drive, Bellair Beach, Indian Rock—one Brantly B2.
Miami Helicopter Service Opa Locka Airport, Opa Locka—one JetRanger, one Bell 47D, five Bell 47G.
Doug Mitchell Silver Springs Airport, Silver Springs—one Bell 47G.
Northeast Duval County Jacksonville—one Hughes 269.
Orlando Helicopter Airways Inc Herndon Municipal Airport, Orlando—13 Sikorsky S-55, one Sikorsky S-52, one Bell 47D, one Bell 47G, one Brantly B2.
H. R. Overton 6404 North Hale, Tampa—two Brantly B2.
R. K. Peck & Associates Inc 4339 West Kennedy Boulevard, Tampa—one Bell 47G.
Mrs Gladys Phipps PO Box 511, Palm Beach—one JetRanger.
Michael Phipps 450 North County Road, Palm Beach—one Hiller UH-12E.
RCA Service Company PO Box 699, Melbourne—two JetRanger.
Norman Reed 8000 SW West 152nd Street, Miami—one Bell 47J.
Schroeder Construction Inc PO Box 806, Boca Raton—one Bell 47G.
Shawnee Grove Corporation PO Box 1208, Fort Pierce—three Bell 47G.
Sherry Joy Corporation 901 Ainsley Building, Miami—six Sikorsky S-52.
Ray Simpson Silver Springs Airport, Silver Springs—one Bell 47G.
Skyway Groves Inc PO Box 1717, Plant City—one Bell 47G.
Sky Lake Helicopters 6540 Tamiami Canal Road, Miami—one Bell 47D.
Smokey's Automotive Service Inc Daytona Beach—one Hughes 269A.
Southeastern Crop Services Fort Pierce—one Bell 47G.
South Eastern Helicopter Services Inc PO Box 1285, Lake Wales—one Bell 47G.
Spherical Corporation 8000 SW West 152nd Street, Miami—one Bell 47J, one Bell 47G.
Sunline Helicopters Inc Opa Locka—one Hughes 269.
Sunshine State Industrial Park Opa Locka Airport—one JetRanger.
Stanley R. Surling PO Box 421, Zellwood—one Bell 47G.
C. J. Tippett PO Box 27, Ocala—one JetRanger.
Ed Treat 1609 Citrus, Fort Pierce—one Brantly B2.
Tropical Helicopters Inc PO Box 444, Hialeah—four Sikorsky S-52.
Waverley Growers Co-operative Waverley—five Bell 47G.
West Coast Groves and Farm Service PO Box 1717, Plant City—one Bell 47G.



NORD 262

26 / 29 SEAT TURBOPROP TRANSPORT

now on the british register

The British independent carrier DAN-AIR SERVICES LTD introduces the now A.R.B. certificated NORD 262 into scheduled service on U.K. routes in July 1970. Airlines in 10 other countries also operate the jetprop NORD 262.

The versatile NORD 262 offers • profitability on low density local service routes • pressurized accommodation for up to 29 passengers and baggage • 200 knot cruise • 500 n.m. range. For full details write to:

AEROSPATIALE (S.N.I.A.S.)
37, Boulevard de Montmorency - PARIS 16^e - FRANCE

DÉPARTEMENT VENTE AVIONS COMMERCIAUX
2, rue Béranger, 92-CHATILLON (FRANCE)

advancing into the 70's

These are the advanced helicopters that the British and French Governments have decided will equip the Armed Forces of their countries, in substantial numbers, in the next decade.



WG.13 British Army



WG.13 French Navy



WG.13 R.A.F.



WG.13 Royal Navy



SA.341 French Army



SA.341 British Army



SA.330 French Army



SA.330 R.A.F.

The British and French Governments have made the decision to launch production of the Sud Aviation SA.341 light general-purpose helicopter and to go ahead with the full development programme of the Westland WG.13 multi-Service, twin-engine helicopter.

This continuing Government support:—

- * Underlines the confidence of both Governments in the joint helicopter programme of Westland Helicopters and Sud Aviation.
- * Fully establishes the range of new helicopters for the British and French Armed Forces.
- * Reflects Government satisfaction with the development progress of WG.13, with the solution of SA.341 technical problems and with the capability of the aircraft to meet British and French requirements.
- * Highlights the strong, well-founded European capability to provide advanced helicopters that will be competitive in cost, delivery and performance.
- * Sets the stage for an intensive export sales drive by Westland and Sud.



Westland Helicopters Limited

Yeovil, Somerset, England

Aérospatiale (S.N.I.A.S.)

2a 20, Av Marcel Cachin, 93 la Courneuve, France



Partners in European Co-operation

WORLD HELICOPTER MARKET...

Whirly Bird Inc PO Box 204, Lake Wales—one Bell 47D, two Bell 47G, one El Torcat.
Williams Air Service 3333 South Indian River Drive, Fort Pierce—one Brantly B2B, Edward Zywicki Box 14, Bean City—one Bell 47G.

GEORGIA

J. P. & W. Adkins Codele—one Hughes 269.
Aviation Service Company Inc Box 20634, Atlanta Municipal Airport, Atlanta—one Sikorsky S-55, two Bell 47D, two Bell 47G.
Campbell Air Service Inc Dekalb-Peachtree Airport, Atlanta—one Bell 47G.
Citizens and Southern National Bank Dekalb-Peachtree Airport, Atlanta—one Brantly 305, three JetRanger.
Derst Baking Company Savannah—one Hughes 269.
Early Helicopter Company Route 2, Arlington—one Hughes 269.
Executive Helicopters Inc Dekalb-Peachtree Airport, Atlanta—one Bell 47G, two Hughes 269.
Executive Jet Helicopters Dekalb-Peachtree Airport, Atlanta—one JetRanger.
Georgia Forestry Commission PO Box 1077, Macon—two Bell 47G.
Helicab Airways Inc 71 Kathryn Drive, Marietta—two Enstrom F-28A.
Jones Helicopter Service Inc Marietta—one Hughes 269.
News Copters Inc PO Box 4167, Macon—one JetRanger, one Bell 47G.
Southeast Helicopters of Atlanta Dekalb-Peachtree Airport, Atlanta—two Hughes 269.
Dr Joe M. Webber PO Box 1459, Columbus—one Enstrom F-28A, one Bell 47G.
Westside Pet Hospital Inc Savannah—one Hughes 269A.

HAWAII

Central Pacific Helicopters Inc 161 South King Street, Honolulu—one Bell 47G, one Bell 47J.
City and County of Honolulu PO Box 3085, Honolulu—one Bell 47G.
Gordon H. Damon & Ted R. James Suite 416, First National Bank Building, Honolulu—one Bell 47G.
Garden Island Helicopters Inc 4122 Rice Street, Lihue—one FH-1100, one Bell 47J.
Kaui Helicopters Inc PO Box 788, Lihue—two JetRanger.
KHVV Television and Radio 1290 Ala Moana, Honolulu—one Bell 47G.
Murray Air Inc PO Box 9488, Honolulu—one Hughes 269A.
Rotorcraft Maintenance Honolulu—one Bell 47G.

IDAHO

Boise Aviation Inc PO Box 4067, Boise—one JetRanger.
Frank Aircraft Company PO Box 64, Caldwell—one Bell 47G.
James E. Hall PO Box 8, Elk River—one Bell 47G.
Helicopters Inc 6505 Strawberry Glenn Road, Boise—one JetRanger, five Bell 47G.
Hillcrest Aircraft Company PO Box 504, Lewiston—four Bell 47G.
Hood Corporation PO Box 4426, Boise—one Bell 47G.
Inter-Mountain Helicopters Inc PO Box 4508, Boise—two FH-1100, five Hiller UH-12E, two Hiller SL4, three Bell 47G, one Hughes 269.
Rex E. Lanham Company Route 2, Emmett—one Bell 47G.
Reeder Flying Service Municipal Airport, Twin Falls—eight Bell 47G.

Treasure Valley Aviation PO Box 77, Marsing—one Bell 47G.
US Forest Service 3014 Airport Way, Boise—two Bell 47G.
Valley Aviation Orofino—one Bell 47G.
Vyrle Wood Malad—one Hughes 269.
Ralph R. Yates 825 8th Avenue, Lewiston—one Brantly B2B.

ILLINOIS

Abingdon Milling and Cattle Feed Company Abingdon—one Hughes 269.
Air Lane Corporation 1132 Michigan Avenue, Wilmette—one JetRanger.
Atwood Vacuum Machine Corporation 1400 Eddy, Rockford—one Bell 47J.
Bev Aire Leasing Corporation 1357 West 103rd Street, Chicago—one Bell 47J, three Bell 47G.
Beverly Agency 1400 West 103rd Street, Chicago—one JetRanger.
Bird Helicopters Inc Peoria—one Hughes 269A.
Brown and Lambrecht Earthmovers Inc Joliet—one Hughes 269.
Butler Aviation 5245 West 55th Street, Midway Airport, Chicago—one Bell 47J.
Chicago Fire Department City Hall, Chicago—one JetRanger, four Bell 47G, one Bell 47J.
Chicago Helicopter Airways Inc Midway Airport, Chicago—three Bell 47G, three Sikorsky S-58, three JetRanger, one Bell 47J.
Chicago Police Force Chicago—two Bell 47G.
Clarke Outdoor Spraying Inc 200 Hayes Street, La Grange—one Bell 47G, one Hughes 269A.
Elliott Flying Service Inc Quad City Airport, Moline—one Hughes 269A.
Fastener Corporation 3700 River Road, Franklin Park—one Hiller UH-12.
Harry H. Holly 2733 Country Club Drive, Olympia Fields—one JetRanger.
Holly-Matic Corporation 80 North Street, Park Forest—two JetRanger, one Bell 47G.
Illinois State Purchasing and Supplies Section 595 South State Street, Elgin—one JetRanger.
Illinois State Toll Highway Commission East-West Tollway, Oak Brook—one JetRanger.
Industrial Aircraft Company Skyharbour Airport, Northbrook—four Brantly 305.
Lewis College Lockport—two Bell 47G.
Mainline Aviation Joliet Municipal Airport, Joliet—three Hughes 269.
McColm Aviation Route 5, Danville—one Bell 47G, one Bell 47J, one Brantly B2, two Hughes 269.
Motorola Inc 4545 West Augusta Boulevard, Chicago 31—one Bell 47H.
David L. Omer Rockford—one Hughes 269A.
Peoria Journal Star 1500 News Plaza, Peoria—one JetRanger.
Peoria Progress Helicopters Inc 117 NE Randolph Avenue, Peoria—one Bell 47J.
Radio Materials Corporation 4242 West Bryn Mawr Avenue, Chicago—one Bell 47G.
Safetycopters Inc 520 West Howard Street, Pontiac—one Brantly 305, one Brantly B2.
Sangamo Construction Company 700 North MacArthur Boulevard, Springfield—one Bell 47G.
Snyder Helicopter Service 22 West 348 Army Trail Road, Addison—one Bell 47G.
South Cook County Mosquito Abatement District PO Box 30, Harvey—one Bell 47G.
Stevens Publishing Company Astoria—one Brantly B2B.
University of Illinois Willard Airport, Savoy—two Hiller UH-12A.
Walston Aviation PO Box 271, East Alton—one Hiller UH-12A.
Wofford Helicopter Service Abingdon—one Hughes 269.

INDIANA

Crescent City Aviation Inc 5701 US Highway 41, Evansville—one Hughes 269.
D.G. Flying Service Elwood Airport, Elwood—one Brantly B2.
General Motors Allison Division, PO Box 834, Indianapolis—one JetRanger.
Hoosier Helicopters 302 South Clinton, Fort Wayne—one Bell 47G.
Indiana Helicopter Corporation Weir-Cook Municipal Airport, Indianapolis—one JetRanger, one Hughes 269A.
Indiana State Police State Office Building, Indianapolis—one Brantly B2.
Indianapolis Airport Authority Weir-Cook Municipal Airport, Indianapolis—one JetRanger.
Lake Helicopters Inc 18165 Brightlingsea Place, South Bend—one Brantly B2.
Marken Aviation Indianapolis—one Hughes 269.
Midway Motors and Aircraft Inc Box 253, Goshen—one Brantly B2.
Nyers Welding Company 11000 Division Street, Attica—one Brantly B2.
Olinger Construction Company Box 67, Huntinburg—one Brantly B2B.
Public Service Company of Indiana 1000 East Main Street, Plainfield—two Bell 47G.
Ralph Rogers & Company PO Box 849, Bloomington—two Bell 47G, one JetRanger.
Edward Sherk RR1, Sherk Airport, Garrett—one Brantly B2.
Ueding Flying Service RR5, Box 254, Vincennes—one Bell 47G.

IOWA

Dean Powers Company RR2, Cedar Rapids—two Bell 47G.
Irvin H. Faur Box 236, Princeton—one Hiller UH-12.
Hawkeye Helicopters Inc Des Moines—one Hughes 269A.
Northair Helicopter Corporation PO Box 169, Arnolds Park—one Bell 47G.
Sargent Helicopters Inc 2525 West Euclid Avenue, Des Moines—one JetRanger.
Schomer Copter Service Harlan—one Hughes 269.
Turner Copter Services Inc Route 3, Griswold—one Bell 47G, one Hughes 269A.
Wetly-Way Helicopter 5386 Sixth Street SW, Cedar Rapids—two Brantly 305, three Brantly B2B.
Western Contracting Corporation Sioux City—one Bell 47G.

KANSAS

Aero Services Inc Wichita—one Hughes 269A.
Caylor Contractors Ottawa—one Hughes 269A.
Comet Aviation Inc 3301 Fairfax Trafficway, Kansas City—two Hughes 269A.
S. L. Gorelick Overland Park—one Hughes 269A.
Hi-Plains Helicopters Inc Box 962, Garden City—one Bell 47G.
Kansas City Police Department Kansas City—three Hughes 269.
Leamon Flying Service Box 6112, Leawood—three Bell 47G, one Hughes 269.
McNutt Inc 7141 W. Kellogg, Wichita—one Brantly B2.
Bud Palen Box 27, Scott City—one Bell 47G.
Robert Schlotzhauer Jr Overland Park—one Hughes 269A.

KENTUCKY

John M. Barrick Glasgow—one Hughes 269.
Bradeis Machinery and Supply Corporation Louisville—one JetRanger.
Helicopters Inc Louisville Airport—one Hughes 269A.
Rotair Inc Blue Grass Field, Lexington—two Hughes 269A.

WORLD HELICOPTER MARKET ...

Todd Uniform Rental Inc Mayfield—one Brantly 305.
George E. Tomlinson Inc Winchester—one Hughes 269.
Raymond Wilson Buena Vista—two Hughes 269.

LOUISIANA

R. W. Bledenharn Route 3, West Monroe—one Bell 47G.
Allen Ross Campbell New Orleans—one Hughes 269.
Campbell Air Service Inc PO Box 32, Vivian—one Sikorsky S-55, eight Bell 47G.
Cane Air Inc Box 5, Belle Rose—one Bell 47G.
Chevron Oil Company Lakefront Airfront, New Orleans—four Sikorsky S-62, two Sikorsky S-55, eight Bell 47J, one Bell 47G.
Flight Inc PO Box 2601, New Orleans—one Bell 47G.
Freeport Sulphur Company Box 61520, New Orleans—two Sikorsky S-62A.
Harper Aviation PO Box 26025, New Orleans—one Bell 47G.
Helicopters Inc 4200 Michoud Boulevard, New Orleans—one Bell 47G.
Helicopter Airways Inc Box 64801, Baton Rouge—two Sikorsky S-55, two JetRanger, one Bell 47D, two Bell 47G, one Hiller UH-12E.
Helicopter Sales of Louisiana Inc New Orleans—one Hughes 269.
Arthur Jones Box 402, Slidell—one Bell 47G.
Kendall Helicopter Service Inc 6128 Dorothea Street, New Orleans—one Bell 47G, one Hughes 269A.
Lyon Flying Service Box 726, Welsh—one Brantly B2.
Offshore Company PO Box 1155, Morgan City—one Bell 47J.
Petroleum Helicopters Inc PO Box T, Lafayette—one Sikorsky S-62A, four Bell 205A-1, ten Bell 204B, 30 JetRanger, 99 Bell 47G, four Hughes 500. On order: six Hughes 500.
Plaquemines Parish Commission Pointe-a-la-Hache—one Bell 47G, one Bell 47J.
Rotor Aids Inc PO Box 186, Grand Isle—five Sikorsky S-62, six Bell 47J, one Bell 47G.
Tennessee Gas Transmission Company Box 1531, Houma—three JetRanger, one Bell 47J.
W. S. Young Construction Company Drawer 950, Ruston—one Bell 47G.

MAINE

Ag Aero Route 1, East Corinth—one Bell 47G.
Folsom Air Service Moosehead Lake, Greenville—one Bell 47G.
Forest Service State Office Building, Augusta—one Bell 47D.
Helicopter Sales and Service Corporation Middle Road, Cumberland Center—one Hughes 269A.
Maine Helicopters Inc 465 Congress Street, Portland—one Bell 47H, two Bell 47G.
North East Helicopter Service Inc RFD 1, Bucksport—one Bell 47G.
Stonyvale Inc Route 1, East Corinth—one Bell 47G.

MARYLAND

Anderson Lumber Company Dover Road, Easton—one Bell 47G.
Annapolis Sand & Gravel Company Annapolis—one Hughes 269.
Bailey Helicopter Service RDI, Newark—one Bell 47D.
F. Bowie Smith Lumber Company 4500

East Lombard Street, Baltimore—one Hughes 269A.
Campbell Sand Company 4911 Calvert Road, College Park—one Hughes 269A.
Chesapeake & Potomac Airways Inc Friendship International Airport, Baltimore—seven Bell 47G.
Executive Aviation Services Inc College Park Airport, College Park—one Enstrom F-28, two Hughes 269, one Bell 47G.
William J. George 835 Allendar Road, White Marsh—one Bell 47D.
Helicopter and Airplane Services Corporation Montgomery County Airport, Gaithersburg—one Alouette II, two Sikorsky S-55.
Ed Jacobsen Jr Inc 4905 Delray Avenue, Bethesda—two Hughes 269.
Loving Helicopters 1339 East-West Highway, Silver Spring—one Hughes 269.
Marshall Hall Park Inc Charles County, Bryans Road—one Bell 47G.
Moran Coal Company Westernport—one Brantly B2.
State Police Department Aviation Section, Pikesville 8—one JetRanger.
State Police Department State Office Building, Annapolis—one Brantly 305.
Bob St Clair Damascus—one Hughes 269A.
Lt C. B. Vaughn 521 Midway Drive, Lexington Park—one Bell 47K.
Vitro Laboratory 14000 Georgia Avenue, Silver Spring—one Brantly B2.
WFRR Radio Station 13 East 20th Street, Baltimore—one Bell 47G.
WWDC Radio 8800 Brooksville Road, Silver Spring—one Hughes 269.
Thomas Zevely 5826 Swarthmore Drive, College Park—one Hughes 269A.

MASSACHUSETTS

Abreen Corporation Brighton—one Hughes 269.
Aeronautics Commission Boston-Logan Airport—one Bell 47G.
Air Associates Inc Beverly Airport—two Hughes 269.
Air General Inc Hanscom Field, Bedford—six JetRanger, five Bell 47J, one Bell 47G.
Bay Colony Helicopters Inc Plymouth Airport, Plymouth—two Bell 47G.
Carson Helicopters of New England Inc 118 Clark Street, Clinton—one Bell 47G.
Chandler Leasing Corporation 69 Hickory Drive, Waltham—one Brantly B2.
Fitchburg Paper Company Box 503, Fitchburg—one JetRanger.
Raymond Leo School Street Extension, Webster—one Bell 47G.
New England Equipment Corporation Auburn—one Hughes 269A.
North Atlantic Airways Inc Box 114, Beverly—three Hughes 269.
Plymouth Copters Inc PO Box 446, Plymouth—one Bell 47D.
Power Service and Supplies Inc 44 Maple Street, Danvers—two Bell 47H.
Sprague Electric Company 87 Marshall Street, North Adams—one JetRanger.
Robert W. Stoddard Worcester—one Hughes 269A.
Tennessee Gas Transmission Company PO Box 286, Agawam—one JetRanger.
Whirlybirds Helicopter Service Haverhill Riverside Airport, Haverhill—one Bell 47G, one Bell 47J, one Sikorsky S-51, one Brantly B2B.
E. W. Wiggins Airways Inc Norwood Airport, Norwood—five Bell 47G.

MICHIGAN

Alexander Construction Company 4641 Hiawatha Avenue, Minneapolis—one Hughes 269A.
Alexander Inc Caldwell Airport, Fairfield—one JetRanger.
Berry Construction Company Lake Wilson—one Hughes 269.
Clark Helicopter Service Inc 517 E. Wash-

ington, Greenville—one JetRanger, three Bell 47G, two El Tomcat.
Commander Aviation Pontiac—one Hughes 269.
Lawrence Gordon Searles—one Brantly 52.
Helicopter Airways Service Inc Detroit Metropolitan Airport, Inkster—four Bell 47G, one Bell 47J.
Hi-Lift Helicopters Inc 39205 Ford Road Westland—one Bell 47G, one Bell 47J, one Carson C-4.
Nelson Helicopter Sales Royal Oak—two Hughes 269.
Omni Helicopters Plymouth—one Enstrom F-28A.
Segmented Carbide Die Company 36855 Schoolcraft, Livonia—one Bell 47H, one Brantly 52.
Utility and Industrial Supply Company 921E Michigan Avenue, Jackson—two Brantly B2.

MINNESOTA

Airift Helicopters Inc Downtown Airport, St Paul—one Hughes 269. On order: one Hughes 500.
Appliance Buyers Credit Corporation 200 Broad Street, St Joseph—four Brantly B2.
James E. Binger 2701 4th Avenue South, Minneapolis—one Bell 47G.
Carroll Container Corporation Detroit—one Hughes 269.
Conservation Department Marquette—one Enstrom F-28.
Executive Helicopters Inc Wold-Chamberlain Airport, Minneapolis—one Bell 47G.
R. C. Fagre 5912 Camden Avenue, Minneapolis—two Hiller UH-12.
Gopher Aviation Inc Rochester Municipal Airport, Rochester—one Hughes 269.
Helix Tackle Company 4099 Baufft, Detroit—one Brantly B2.
Hubbard Broadcasting Company (KSIP) Minneapolis—one Hughes 500.
John Kelly and Associates Inc Minneapolis—one Hughes 269.
Lakeline Helicopters Inc Southport Airport, Rosemount—12 Bell 47G, one Bell 47J.
Lametti & Sons Inc 2560 North Cleveland Avenue, St Paul—one JetRanger, one Hughes 269A.
Land of Lakes Airways Inc Little Falls—one Hughes 269.
Jerry B. Mansfield Baudette—one Hughes 269A.
Marine Iron and Ship Building Company 325 Lake Avenue South, Duluth—one JetRanger.
Modern Constructors Inc 325 Lake Avenue South, Duluth—one JetRanger, one Bell 47G.
Nohl Helicopter Spray Service Hancock—two Hughes 269A.
Nor Jean Company Minneapolis—one Hughes 269.
Oakland County Sheriff Pontiac—one Enstrom F-28A.
Ranger Aviation Inc PO Box 728, Fairmont—two Bell 47G.
Ranger Aviation Inc 4940 Viking Drive, Minneapolis—two Bell 47G.
Witte Helicopters RR1, Morton—one Hughes 269A.

MISSISSIPPI

Christmas Flying Service PO Box 768, Shelby—one Bell 47G.
Walter B. Crook Jr 119 North Oak Avenue, Ruleville—three Bell 47G.
Delta Ag-Rotors Inc Box 3, Ruleville—three Bell 47G.
Cy Emery Box 683, Laurel—one Bell 47G.
G2 Helicopter Inc PO Box 1073, Vicksburg—one Bell 47G.
General Helicopters Inc 119 North Oak Avenue, Ruleville—three Bell 47G.
Helicopter Service Inc 315 South Dianne Avenue, Ruleville—one Bell 47G.

LYCOMING overhauls

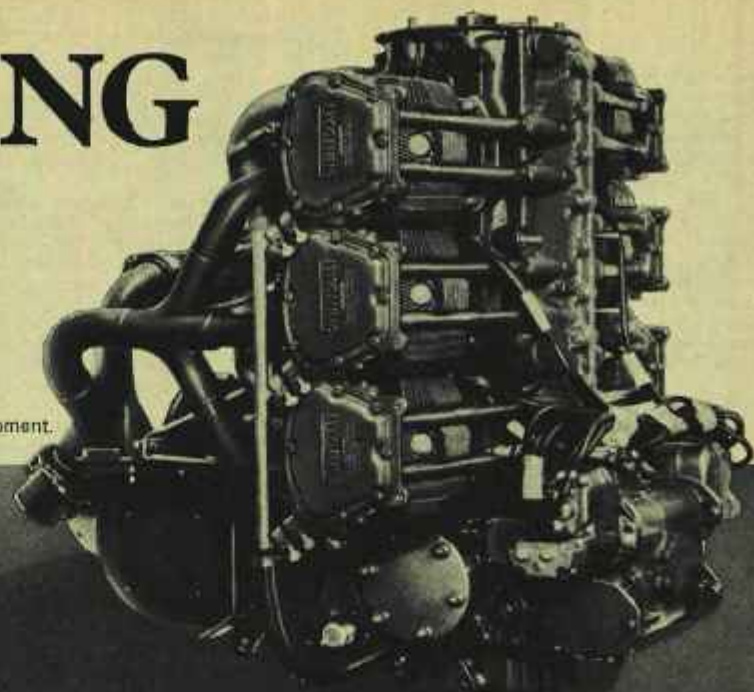
Approved U.K. overhaul and service facilities for:

LYCOMING Engines, and Lycoming Engine exchange, for helicopter and fixed wing types.

BENDIX Carburettors, Fuel Injection and Ignition Equipment.

MARVEL-SCHEBLER Carburettors.

GARRETT AIR-RESEARCH Turbochargers and Control Equipment.



ALVIS OF COVENTRY, ENGLAND

Telephone: MAIN WORKS: Coventry 25501. FLIGHT DEPARTMENT: Toll Bar 2311

FLIGHT CATCHER

This specially made binder holds up to 26 copies of Flight. Bound in black leather cloth with "Flight" blocked in gold leaf on the spine, it's a handsome addition to any library. And a very fair price at a guinea. Why not buy two? It's open season on our Flightcatchers.

To: Trade Counter, IPC Business Press (S & D) Ltd.,
Dorset House, Stamford Street, London S.E.1.
Please send me Flight binders at £1.1.0. each, post paid.

I enclose remittance

NAME

ADDRESS

Farnborough Air Display

Special excursion to Farnborough
Saturday 12th September

Fare includes reserved seat
on Buffet Car train and
admission to Flying Display

70/-
Children 40/-

From Manchester Piccadilly, Stockport and Wilmslow
See press announcements for details

Advance bookings commence Monday 17 August



British Rail London Midland



HYCALAM & HYCATROL

FLEXIBLE TANKS

For the fuel systems in the Sea King,
WG.13, Boelkow 105, Jet Ranger and the
majority of military and civil aircraft.



FPT INDUSTRIES LTD

The Airport · Portsmouth · England · PO3 5PE · Tel: 62391 (4 Lines) · Telex: 86106

WORLD HELICOPTER MARKET...

Magnolia Aviation Laurel—one Bell 47G.
Mid-State Paving Company PO Box 5498, Meridian—one JetRanger.
Mississippi Highway Patrol Highway 51, Jackson—one Bell 47G.
Mullins Flying Service Marigold—one Bell 47G.
Prairie Equipment Company Box 86, Okolona—one Bell 47G.
Robbins Airborne Gulfport Inc Gulfport—one Hughes 269.
Southern Helicopters Inc 104 Spring Street, Lexington—one Bell 47G.
State Aircraft Pool PO Box 331, Jackson—one Bell 47G.

MISSOURI

Beilenson Plumbing Company 5914 Dayton Road, St Louis—one Brantly B2.
Thomas A. Duke Farmington—one Hughes 269.
Duncan Corporation Tarkio—one Hughes 269A.
Executive Helicopters Inc Kansas City—one Hughes 269A.
Ken Fairchild's Mid-Continent Aviation Kansas City—one Hughes 269A.
Fostaire Heliport Inc 1000 North Wharf, St Louis—one Bell 47G, one Bell 47J.
Lee-Wood Boat and Motors Inc Lake Ozark—one Bell 47J.
Mid-America Helicopters Inc PO Box 41, St Charles—one Bell 47G.
Missouri Highway Patrol 221 West High, Jefferson City—one Bell 47G.
NW Electric Power Co-operative Inc Cameron—one Hughes 269A.
Pack Rite Packaging and Crating Company PO Box 5697, St Louis—one JetRanger.
Pulitzer Publishing Company 1133 Franklin Avenue, St Louis—one Bell 47G.
Quad State Helicopter Service Box 356, King City—one Bell 47G.
Remmert-Werner Inc Lambert-St Louis Municipal Airport, St Louis—one FH-1100, one Sikorsky S-51.
Fred Weber Contractors Inc 7929 Alabama Avenue, St Louis—one JetRanger.

MONTANA

Central Air Service Inc PO Box 895, Lewistown—one Bell 47G.
Jerry Lee Coldwell Jordan—one Hughes 269.
Department of Fish and Game Mitchell Building, Helena—one Bell 47G.
First National Park Bank Livingston—one Hughes 269.
Hoffmann Custom Flight Service Billings—one Hughes 269.
Rich Hope Big Horn—one Hughes 269A.
E. K. Jenkins Company Box 2168, Great Falls—one Bell 47G.
Johnson Flying Service Inc PO Box 1366, Missoula—one JetRanger, seven Bell 47G.
Kruger Flying Service Municipal Airport, Cut Bank—one Bell 47G.
Laurel Helicopter Sales Box 238, Laurel—one Hughes 269A.
Eugene L. Mendel PO Box EE, Malta—one Bell 47G.
Edward D. Mills Billings—one Hughes 269.
Missoula Skyline Inc Box 540, Missoula—one Hughes 269.
Sky Harbour Enterprises Inc PO Box 400, Billings—one Hughes 269.
William George Ward B Bar Ranch, Emigrant—one Bell 47G.
Yellowstone Skyways Inc PO Box 491, Livingston—one Bell 47G.

NEBRASKA

Bridgeport Equipment Company Bridgeport—one Brantly B2.

Crosstown Helicopters Inc Omaha—one Hughes 269A.
Don Air Service Alliance—one Brantly 305, two Brantly B2B.
E. V. Eldred Pawlet Ranch, Lakeside—one Brantly B2B.
Leigh Fitzgerald Hayes Center—one Brantly B2.
Dowd Grain Company Aurora—one Hughes 269A.
Charles R. A. Hannah Lisco—one Brantly B2.
Knight Brothers Chapman—one Brantly B2.
Lincoln Helicopters Inc Lincoln Municipal Airport, North Hangar—one Bell 47G.
Mid-Continent Helicopter Associates Box 699, Downtown Station, Omaha—one Enstrom F-28A.
Ord Aircraft Sales PO Box 346, Ord Municipal Airport—one Bell 47G.
Panhandle Aviation Inc PO Box 788, Lincoln—one JetRanger, one Bell 47G, three Bell 47J.
Platte Valley Helicopters Box 19255, Eppley Field, Omaha—one Brantly B2B.
Kuhl Reece Inc Ashland—one Hughes 269.
Sandhills Airways Inc Box 281, Gordon—one Brantly B2.
James E. Simon Company Box 130, North Platte—one Brantly B2.
Pioneer Village Inc Minden—one Bell 47B.

NEVADA

Ag Aviation Academy Reno-Stead Airport—one Bell 47G.
Agricultures-AGR Aviation Engineering Corp 1333 Patrick Lane, Las Vegas—one Hughes 269A.
American Investments Inc 1 East First Street, Reno—20 Piasneki HUP.
Francis E. Dubois III Tonopah—one Hughes 269A.
Harveys Resort Hotel PO Box 128, State-line—one Bell 47G.
Lake Tahoe Helicopters Inc PO Box 2005, State-line—one Bell 47G, one Hiller SL4, one FH-1100.
Sonora Aviation Inc Carson City Airport, Carson City—one Bell 47G.

NEW JERSEY

Aeroflex Corporation Box 411, Newton—one Hiller UH-12E.
Ankolas Dyeing and Processing Company 14 King Street, Mount Holly—one Brantly B2.
Beaver Island Films Inc Bergenfield—one Hughes 269.
Helen Bott Cinnaminson—one Hughes 269A.
Conrad Inc Box 93, Old Wick—one Bell 47J.
Cresco Builders 6215 Crescent Boulevard, Pennsauken—one Brantly B2B.
Hanover Flying Service 720 Ridgedale Avenue, Hanover—one Bell 47G.
Jacobson Manufacturing Company Kenilworth—one Hughes 269.
Jens Corporation 47 West Grand Street, Elizabeth—one Hughes 269.
Johnson & Johnson Inc Linden Airport, Linden—one Sikorsky S-62A, one Sikorsky S-51.
Lexington Manor Pennsauken—one Hughes 269.
Lockheed Electronics Company US Route 22, Plainfield—one Enstrom F-28, one FH-1100.
Mark A. McCarthy Jacques Bridge Road, Atco—one Bell 47G.
Metropolitan Helicopter Corporation PO Box 297, Ridgefield Park—one Bell 47J, one Bell 47G, one Hughes 269, one Brantly B2.
Monmouth County Airport Inc Farmingdale—one Bell 47G.
Newirth Management and Research Corporation Bank Building, Middletown—one JetRanger.

Newark Air Service Inc Hangar 12, Newark Airport—one JetRanger.
Northeast Helicopters Inc Caldwell—one Hughes 269, one Bell 47J, one JetRanger.
Mr Patton Bellemonte—one Hughes 269A.
Public Copters Inc PO Box 34, Blackwood—one Bell 47J.
Rayette-Faberge Newport Airport—one JetRanger.
Ringwood Construction Company Ringwood—one Bell 47G.
Rogers Enterprises North Park Drive, Pennsauken—one Hughes 269.
Ronson Corporation Ronson Road, Woodbridge—one JetRanger.
Ronson Helicopters Inc Mercer County Airport, Trenton—one Bell 47G, two Bell 47J, six Hughes 269, one Enstrom F-28A.
John J. Ryan Sanssouci Estate, Linwood—three Bell 47G.
Skinners Salted Nuts and Candy Company Highway 17, Ramsey—one Enstrom F-28.
Somerset Land and Cattle Company Griggstown Road, Belle Mead—one JetRanger.
Suburban Helicopters Inc Linden Airport, Newark—one JetRanger.
Richard Switlik Allentown—one Hughes 269A.
Tri-State Helicopters Inc PO Box 164, Great Meadows—one Bell 47G.
Williams Company South River—one Hughes 269A.

NEW MEXICO

Alamo Airways Inc Alamogordo—one Hughes 269.
Anasconda Company Grants—one Bell 47G.
Cutter Flying Service Inc PO Box 274, Albuquerque—one Hughes 269.
Golden Spread Helicopters 2208 North Price Street, Clovis—one Hughes 269A.
Grants Aero Service Grants—one Hughes 269A.
Interstate Helicopters Inc Coronado, Albuquerque—three Bell 47G, one Hiller UH-12E, one Hiller L4.
Metals Corporation of America PO Bin F, Silver City—one Bell 47G, one JetRanger.
T. E. Mitchell & Sons Albert—one Hughes 269A.
Public Service Company of New Mexico PO Box 2267, Albuquerque—one JetRanger, one Bell 47G.
Southwestern Skyways Inc PO Box 6351, Albuquerque—one Hughes 269A.
T-4 Cattle Company Montoya—one Hughes 269A.

NEW YORK

Ag Air Leasing Service Inc RD2, Waterloo—three Bell 47G.
Albany Helicopters Inc Albany—one Hughes 269A.
Basil Helicopter Corporation Buffalo—one Hughes 269.
Bell Aerosystems Company PO Box 1, Buffalo—one JetRanger.
Bell Copter Service 22 Ball Street, Port Jervis, two Bell 47G.
Black Watch Farms Inc Fiskill Plains—one JetRanger.
Bucholz Transmission Company Buffalo—two Hughes 269.
Butler Aviation LaGuardia Airport, Flushing—two Bell 47J.
Central New York Helicopter Sales Corporation 360 West Fayette Street, Syracuse—one Brantly B2.
Channel Master Ellenville—one JetRanger.
Congel-Hazard Inc 4641 Crossroads Park Drive, Liverpool—one Bell 47G, one JetRanger.
Maurice Culverwell Newfane—one Bell 47D.
Cu Mara Corporation 102 Main Street, Port Jefferson—one Bell 47G.
L. A. Cushman PO Box 466, Patterson—one Bell 47D.

Howard Dart Winch Road, Jamestown—one Hughes 269.
Richard B. Dawkins 60 Broad Street, New York—one JetRanger.
Decair Helicopters Inc Ramapo Valley Airport, Spring Valley—one JetRanger, one Bell 47J, two Bell 47G.
Decker Construction Company Elmira—two Brantly B2.
DeJohs Helicopter Agency 2700 Manhattan Avenue, Ithaca—one Brantly B2.
Delong Corporation New York City—two Hughes 269.
Department of Conservation Aviation Division, Albany County Airport, Albany—one Bell 204B, one Bell 47G.
Elba Air Dusters Inc Box 186, Elba—three Hughes 269A.
Empire Helicopters Inc Westchester County Airport, White Plains—one Bell 47G.
Execuplane Inc Westchester County Airport, White Plains—one JetRanger, one Bell 47J.
Fairchild Hiller Corporation Republic Division, Farmingdale—one FH-1100.
Flight Safety Inc Marine Air Terminal, LaGuardia Airport, Flushing—six JetRanger.
416 Street Corporation New York City—one Hughes 269A.
Gautier Construction Company 3 Graham Street, Batavia—one Bell 47G.
Gruaman Aircraft Engineering Corporation Bethpage, Long Island—one Sikorsky S-62A.
Halcon International Inc 2 Park Avenue, New York—two Bell 47D, three Bell 47G.
Hampton Helicopters Inc Westhampton Beach, Long Island—one Brantly B2B, one Brantly 305.
Hecht Construction Company Box 176, Mattydale—one Bell 47G.
Hel-Aire Copters Inc Midtown Heliport, 12th and 30th Street, New York—one Bell 47J, five Hughes 269, one Brantly 305.
Helicopter & Airplane Services Corporation Hangar A, White Plains Airport—two Alouette II, two Sikorsky S-55.
Helicopter Sales Inc 115-06 Myrtle Avenue, Richmond Hills—one Hiller UH-12.
Huessler Helicopter Corporation 3559 Lake Shore Road, Buffalo—two Bell 47G.
Hilton Flying Service Inc Hilton Airport, Hilton—one Hiller UH-12B, one Hughes 269.
Industrial Flight Service Inc Schenectady County Airport, Schenectady—one Hughes 269.
Island Helicopters Inc Whitney Hangar, Zahns Airport, Lindenhurst—one Bell 206A.
Jamestown Macadam Inc Jamestown—one Brantly B2.
Joyce Pipeline Box 385, Andover—two Brantly B2.
Kent Helicopters Inc Route 2, Mayville—one Bell 47G.
Knox Gelatine Inc Johnstown—one Hughes 269.
LHJ Corporation Ellenville—one JetRanger.
Lyon Air Inc Route 58, Riverhead, Long Island—six Bell 47G, one Bell 47J.
Lyon Auto Leasing Inc Route 25, Coram, Long Island—six Bell 47G.
Paul J. McCormick Bliss—one Hughes 269.
McGovern Sod Farms Melville, Long Island—one Bell 47G.
Jim McKenzie Realty Inc Princeton Heights Town Road, Princeton—one Bell 47G.
Metropolitan Helicopters Inc Zahns Airport, Amityville, Long Island—one Brantly B2.
Mileris Corp PO Box 1691, Poughkeepsie—one Carson C-4.
Mobil Oil Corporation 150 East 42nd Street, New York—one Bell 47G.
New York Airways Inc PO Box 426, LaGuardia Airport, Flushing—four Sikorsky S-61L, four Vertol 107.

New York City Police Department Floyd Bennett Field, Brooklyn—four JetRanger, three Bell 47G.
New York State Police Department Albany County Airport, Albany—one Bell 47G.
Nassau County Police Department Long Island—one FH-1100.
North-South Helicopters Inc 80 Main Street, Dansville—three Sikorsky S-55, four Hiller UH-12B, one Sikorsky S-51.
O'Donnell-Quigley Company 128 Ball Circle, Syracuse—one Brantly B2.
Page Airways Inc Rochester—one Hughes 269.
Pan American Oil Company New York City—one Hughes 269.
Port of New York Authority 111 8th Avenue, New York—two JetRanger.
Prior Aviation Greater Buffalo International Airport, Buffalo—two Bell 47G, one JetRanger.
Joseph E. Seagram & Sons 375 Park Avenue, New York—one JetRanger.
Jack Stevens Buick Inc 2310 Delaware Avenue, Buffalo 16—one Hughes 269.
Suffolk County Police Department Hauppauge, Long Island—one Alouette II.
Tennessee Gas Transmission Company 51 Federal Avenue, Buffalo—one Bell 47J.
Thomson Industries Inc Manhasset, Long Island—one Bell 47J.
Timbello Helicopters Inc 5830 Bridge Street, East Syracuse—three JetRanger, five Bell 47G.
Tishman Equipment Leasing Corporation 666 Fifth Avenue, New York—one Bell 47B.
Tree Preservation Company Elmsford—one Bell 47G, one Bell 47H.
Traubson & Company 114-02 Fifteenth Avenue, College Point—one Bell 47J.
Upstate Helicopter Service Inc 35 Park Avenue, Binghamton—one Hughes 269.
WOR Radio Hangar 7, LaGuardia Airport, Flushing—one Bell 47G.
Yorkstown Industries Inc Lakewood—two Hughes 269.

NORTH CAROLINA

Bar-Fly Corporation Hamilton Road, Pineville—three Bell 47G.
Benbow Aviation Inc PO Box 138, Alamance—one Bell 47G, one Bell 47J.
K. M. Biggs Inc Elm Street, Lumberton—one Hughes 269A.
Carolina Air Traders Inc PO Box 128, Morrisville—one Hughes 269A.
Carolina Helicopter Corporation 301 Wachovia Bank Building, Durham—two Bell 47G.
Glenn Darrrough Route 3, Chandler—one Bell 47G.
Deneen Mica Company Inc Newdale—one Brantly B2.
Gifton McCreary Box 77, Landis—one Bell 47G.
Helicopter Charter Inc Municipal Airport, Shelby—one Bell 47G.
Helicopter Service Inc 1608 Spring Garden Street, Greensboro—one Bell 47D.
Jonathan T. McLane Morrisville—one Hughes 269A.
Mineral Spring Helicopters PO Box 8, Mineral Spring—one Hughes 269A.
Piedmont Aviation Inc Smith-Reynolds Airport, Winston-Salem—one JetRanger.
Bill Price Helicopters Inc 215 West Kime Street, Burlington—four Hughes 269.
Shelby-Aero Municipal Airport, Shelby—five Bell 47G.
Fred B. Stencel Asheville—one Hughes 269.
Taylor Wilkes Tractor and Implement Company PO Box 518, Elizabethtown—three Hughes 269A.
Thremo Belt Air Service PO Box 1301, Tryon—two Hughes 269.
Weyerhaeuser Company North Carolina Division, Plymouth—one Brantly B2.

NORTH DAKOTA

Blikre Motors Inc Tioga—one Brantly B2.
Chandler Helicopter Distributors Box 813, Williston—one Brantly B2.
Glinz Helicopter Service Bottineau—one Brantly B2.
El Tonnance Box 367, Bismark—one Brantly B2.
Trinity Hospital Main and Fourth Avenue, Minot—one Bell 47J.
Turner Helicopter Service Arthur—one Bell 47G.

OHIO

Ag Helicopters Inc PO Box 2221, North Canton—one Bell 47G.
Aerial Patrols Inc Box 2106, North Canton—six Bell 47G.
Air Central 17877 St Clair Avenue, Cleveland—three JetRanger.
Air Central Burke-Lakefront Airport, Cleveland—two Hughes 269, one Brantly B2B, one Brantly 305.
Associated Developments Inc Akron-Canton Airport, North Canton—one JetRanger.
Boyas Excavating Inc Cleveland—one Hughes 269A.
Lewis C. Buell Springfield—one Hughes 269.
Burkhardt Pipeline Construction Company Avon Lake—one Hughes 269A.
Cleveland Hangars Cleveland—one Hughes 269.
Contractors Inc Vermillion—one Hughes 269A.
Dayton Heidelberg Dis. Company Dayton—one Hughes 269.
Dayton Helicopter Service Inc 901 South Ludlow Street, Dayton—one Bell 47G, two Hughes 269.
Department of Highways Ohio State Building, Columbus 15—one Bell 47J.
Direct Air Helicopters 2141 Old Clifton Road, Springfield—one Brantly B2, one Hughes 269.
Fisher Fazio Costa Foods Cleveland—one JetRanger.
Frederickson Inc Box 498, Columbus—one Hughes 269A.
Dr F. Hamilton 1831 Forest Hill Boulevard, Cleveland—one Hughes 269A.
Hartzell Industries Inc Piqua—one Hughes 269.
Helicopter Minit-Men Inc PO Box 5625, Columbus—five Hiller UH-12E, one Hiller SL4.
Helicopter Services Inc Riverside Airport, Zanesville—one JetRanger, two Brantly B2B, one Brantly 305.
Helicopter Services Inc Columbus—two Hughes 269.
Klingshirm Builders 1230 West River Road, Vermillion—one Hughes 269A.
Larry L. Mason Cincinnati—one Hughes 269A.
Robert A. Mayes Milford—one Hughes 269A.
Meyer Products Inc 18513 Euclid Avenue, Cleveland—one JetRanger.
Midwestern Helicopter Service Broadcast House, Toledo—one Bell 47D.
Nerone & Sons Inc Mayfield Heights—one Hughes 269A.
Ohio State Patrol 660 East Main Street, Columbus 5—one Hiller UH-12E.
Ohio Valley Airways Inc Hangar 22, Lunken Airport, Cincinnati—two Bell 47H, one Bell 47G.
Schearway Helicopter Company Vandalia—one Hughes 269.
John O. Scott Route 1, Terrace Shores, Zanesville—one Brantly B2B.
Skyways Inc Dayton Municipal Airport, Vandalia—one Bell 47G.
Sandorf Aeronautical Corp Cleveland-Hopkins Airport, Cleveland—one Hughes 269.
Dean Svec 6589 Dunham Road, Bedford—one Brantly B2.

WORLD HELICOPTER MARKET...

United Excavating and Wrecking Company 7247 Division Street, Bedford—one Bell 47G.

WCUE Radio Inc 424 Sackett Avenue, Akron—one Enstrom F-28.

Don C. Wilson Vandalia—one Hughes 269A.

Leon R. Wise Dayton—one Hughes 269A.

OKLAHOMA

Aircraft Lease & Charter Inc Liberty Bank Building, Oklahoma City—five Bell 47G.

Allied Helicopter Service Inc RFD 8, Tulsa—one Bell 47D, five Bell 47G, one Bell 47B.

Stan Burnstein Tulsa—one Hughes 269A.

Dunbe Company PO Box 38, Ardmore—one Brantly B2B.

Skip Healey Davis—one Brantly B2.

Hobard Flying Service Inc PO Box 112, Hobart—one Bell 47D.

Hudson Oil Company Box 2646, Tulsa—one Brantly B2.

FAA Academy of Helicopter Training Wiley Post Airport, Bethany—one JetRanger, one Bell 47G.

International Crystal Manufacturing Company 18 North Lee, Oklahoma City—one Bell 47G.

Kerr Aviation PO Box 399, Bethany—one FH-1100, one Brantly B2B.

Kinzie Industries Alva Municipal Airport, Alva—six Hughes 269.

Oklahoma City Auto Rental 1142 North Robinson, Oklahoma City—one Bell 47G.

Page Aircraft Maintenance 415 South Eleventh Street, Lawton—14 Bell 47G.

Reading and Bates Exploration Company 1101 Philtower Building, Tulsa—one Bell 47G.

Reading and Bates Offshore Drilling Company Box 864, Morgan City—one Bell 47G, one Bell 47J.

Ross Aviation Riverside Airport, Tulsa—one Hughes 269A, one Brantly B2.

Tulakes Aviation Inc Bethany—one Hughes 269.

Tulsa Two-Way Radio Inc Box 6097, Tulsa—one Brantly B2.

Versatile Helicopters PO Box 1433, Ardmore—one Bell 47G.

J. H. Whitaker 4200 East 111th Street, Tulsa—one Brantly B2.

OREGON

Albany Airways Inc 3310 Knox Butte Road, Albany—four Brantly B2, one Hiller UH-12B, one Bell 47G.

Lee D. Alvord Otis—one Hughes 269A.

Beathe Helicopters Inc PO Box 115, McMinnville—one Bell 47G.

James Biskey Sheridan—one Hughes 269.

Bly Logging Company Klamath Falls—one Hughes 269A.

Bohemia Lumber Company Culp Creek—one FH-1100.

E. M. Bowers Company Beaverton—one Hughes 269A.

Butler Farm Air Company Box 338, Roberto Field, Redmond—one Hughes 269A.

Columbia Helicopters Inc Swan Island, Portland—one Sikorsky S-61N, three Boeing Vertol 107, six FH-1100, two Bell 47G, two Hiller UH-12E, one Hiller SL4, seven Hughes 269.

Consumers Coal and Fuel Company 520 Ash Street, Scranton—one Bell 47G.

Coons Flying Service Butter Creek, Echo—one Hughes 269.

Curry County Communications 607 Railroad Street, Brookings—one Bell 47G.

Delong Corporation 5306 NE Irving, Portland—one JetRanger.

Drury Flying Service Box 64, Coburg—one Bell 47G.

Eagle Flightways Inc Portland-Hillsboro Airport—one Bell 47G.

Evergreen Helicopters Inc Box 358, McMinnville—two Bell 205A, one FH-1100, eight Hiller UH-12E, two Hiller SL4.

First National Lease Corporation 433 SE Carruthers Street, Portland—two Bell 47G, two Bell 47J.

Grote Aviation Box G, Joseph—one Bell 47G.

Ray Harris Company Enterprise—one Hughes 269.

Henderson Aviation 2435 Onyx Street, Eugene—three Bell 47G, one Hughes 269A.

Huffman Grinding Service 754 Filmore, Eugene—one Hiller UH-12A.

Inland Equipment Company 26660 Vine Street, Grants Pass—one Bell 47G.

John Inman Hillsboro—two Hughes 269.

Interstate Vehicle Management Inc 336 NE 20th Avenue, Portland—one Hughes 269B, two Bell 47G, one Bell 47J.

Robert D. Jackson Grants Pass—one Hughes 269A.

J & T Construction Inc Eugene—one Hughes 269A.

Don R. Johnson Box 66, Riddle—one Bell 47G.

Quay Jorgensen 2410 Mulkey Street, Corvallis—one Hiller UH-12C.

Donald L. Kepler Portland—one Hughes 269A.

Walter D. Miller Company Stayton—one Hughes 269.

Pioneer Associates Inc Portland—one Hughes 269A.

Portland General Electric Company 621 SW Alder Street, Portland—one JetRanger.

Rambling Rotors Route 2, La Grande—one Bell 47G, one Bell 47J.

Reforestation Services Inc PO Box 3291, Salem—three Hiller UH-12E.

Rupert Flying Service Inc Beaverton—one Hughes 269A.

Robert V. Sawalish Pendleton—one Hughes 269.

Schultz Enterprises Inc PO Box 368, McNary—one Bell 47G.

US Department of Agriculture Forest Service, PO Box 3623, Portland—one Hiller UH-12E.

US Department of Agriculture Forest Service, Troutdale Airport, Troutdale—one Hiller UH-12E.

US Department of Agriculture Agriculture Engineering Research Division, Box 278, Forest Grove—one Bell 47D.

US Department of the Interior PO Box 491, Portland—two JetRanger, four Bell 47G.

Bolt W. Warren Company Portland—one Hughes 269A.

Western Air Industries PO Box 1296, Medford—one Bell 47G.

Western Helicopter Service PO Box 14612, Portland—two Bell 47G.

Williamette Helicopter Service 188 Maynard Avenue, Eugene—one Bell 47G.

C. N. Winnestad 75 SW 88th Avenue, Portland—one JetRanger.

PENNSYLVANIA

AgRotors Inc Box 91, Gettysburg—two Bell 47D, four Bell 47G, one Carson C-4.

Americus Airways Allentown-Bethlehem-Easton Airport—three Sikorsky S-55.

Asplundh Aviation Inc 505 York Road, Jenkintown—one JetRanger, one FH-1100, 12 Bell 47G.

Robert E. Beck 423 West Butler Avenue, Chalfont—one Hughes 269A.

Butler Aero Corporation 107 East Gowen Avenue, Philadelphia 19—one Bell 47G.

Carson Helicopters Inc RR1, Perkasie—two Sikorsky S-58, two Sikorsky S-55, one Bell 47D.

Civil Defense Council Commonwealth of Pennsylvania, Harrisburg-York State Airport, New Cumberland—one Sikorsky S-51.

H. Clair Parr 143 East Main Street, Bloomsburg—one Brantly B2.

Clifford Carts Coudersport—one Bell 47G.

Copters Inc Philadelphia International Airport, Philadelphia—two JetRanger, three Bell 47G, two Bell 47J.

James T. Crissman PO Box 274, Clearfield—one Bell 47D.

Davis Printing Company Route 63, Huntington Valley—one Bell 47H.

Decker Corporation 45 Monument Road, Bala Cynwyd—one Bell 47J.

Delaware Valley Helicopters 3M Airport, Bristol—one Bell 47G.

Diamond Fuel Company 4871 Rolling Mills Road, Pittsburgh—one Bell 47G.

Stewart Doughty 312 Welsh Road, Ambler—one Brantly 305.

Engle Flying Service Inc 11 Locust Lane, Levittown—one Bell 47G.

Fred Fiore 60 Clover Drive, Pittsburgh—one Bell 47G.

GO Helicopter Airways Inc New Industrial Drive, Bethlehem—one Bell 47G.

Grose Funeral Home Mount Pocono—one Brantly 305.

Helair Inc Box 411, Lansdale—two Bell 47D.

Paul R. Kaiser PO Box 377, Gwynedd—one Bell 47G.

Henry C. Kaweckie Box 151, Fleetwood—one Brantly B2.

Keystone Helicopter Corporation Philadelphia International Airport, Philadelphia—one Sikorsky S-58, one Sikorsky S-55, three JetRanger, two Bell 47G.

Kittner Aircraft & Flying Service 638 Willow Avenue, Honesdale—one Hughes 269A.

Main Line Helicopters Inc New Garden Airfield, Toughkenamon—one Bell 47G, one Hughes 269A.

Mid-America Supply Company 250 Newport Road, Blairsville—one Bell 47J.

Miller Aviation Centre Allegheny County Airport, West Mifflin—two Brantly B2B, one Brantly 305.

Papillon Contracting Company Stroudsburg—one Hughes 269A.

PennLewis Helicopters Riverside Drive, Lewistown—two Bell 47D.

Pittsburgh Police Department Pittsburgh—one Bell 47G.

Shawville Coal Company PO Box 14, Shawville—one Bell 47G.

Lawrence Sherbine PO Box 66, Wilmore—one Brantly B2.

US Steel Corporation Greater Pittsburgh Airport, Pittsburgh—one JetRanger.

Dr James P. Watson RD2, Union Dale—one Brantly B2B.

West German Sales and Service Company 404 Pennsylvania Avenue, Fort Washington—one Brantly B2.

Williamsport Area Community College 1005 West Third Street, Williamsport—one Bell 47D.

Arthur M. Young Dowling Road, Downingtown—one Bell 47D.

PUERTO RICO

Puerto Rico Water Resources Authority PO Box 4267, San Juan—one Sikorsky S-58, three Hiller UH-12E.

RHODE ISLAND

Edward Butler 377 Taunton Avenue, Providence—one Bell 47J.

Copters Unlimited T. F. Green State Airport, Warwick—five Bell 47D, five Bell 47G, one Bell 47H.

Rhode Island Division of Aeronautics State Airport, Warwick—two Bell 47H.
Textron Inc 10 Dorrance Street, Providence—two JetRanger.

SOUTH CAROLINA

Agricultural Helicopters Inc Box 191, Cameron—nine Hughes 269.
Becker County Sand and Gravel Company Chaw—one Hughes 269.
Charter Copters Inc Chester—one Hughes 269.
Eagle Aviation Inc Aiken—one Hughes 269.
Hazen Carroll Lexington—one Hughes 269.
Inland Air Lines Inc PO Box 1144, Myrtle Beach—one JetRanger, four Bell 47G.
C. D. Polston Blenheim—one Hughes 269A, one Bell 47G.
South Carolina Helicopters Inc PO Box 636, Saluda—two Hughes 269.
Southern Ag Helicopters Inc Orangeburg—one Hughes 269A.
Spring Mills Inc Fort Mills—one JetRanger.
Tribble Construction Company Anderson—one Hughes 269.

SOUTH DAKOTA

William Hebron PO Box 1272, Huron—one Bell 47G.
US Department of the Interior Bureau of Reclamation, Missouri River—one JetRanger.

TENNESSEE

Anderson Electronic Corporation 6336 Noel Drive, Brentwood—one Brantly B2.
Delta Copters Inc Nashville—three Hughes 269.
W. F. Deneen 911 Woodland Avenue, Johnson City—one Brantly B2.
Helicopters First Inc PO Box 30048, Memphis—three JetRanger, one Bell 47G, one Enstrom F-28A.
Knox Copters Inc 7109 Afton Drive, Knoxville—two Bell 47G.
National Helicopters Memphis—three JetRanger, two Hughes 269A.
Ridgefields Inc PO Box 9, Kingsport—one FH-1100, one Hughes 269.
Tennessee Valley Authority Muscle-Shoals Airport—six Bell 47G, one Bell 47K, four Bell 47J.
Tennessee Highway Patrol State Office Building, Memphis—three Bell 47G.

TEXAS

Bill Adkins 3410 East 14th Street, Amarillo—one Brantly B2.
Agri Copters Inc Box 821, Premont—one Bell 47G, one Bell 47D, one El Tomcat.
Bee Aviation Inc Dallas—one Hughes 269A.
Bell Helicopter Company PO Box 482, Fort Worth—six Bell 204B.
Boys Duxing and Spraying Service PO Box 1083, Sinton—one KitzCopter.
Dan Braman 400 Victoria Bank & Trust Building, Victoria—one JetRanger, one Bell 47G.
Francis Brinster 2425 East Austin, Harlingen—one Bell 47D.
Andrew J. Calaway PO Box 612, Ganado—one Bell 47G.
T. L. Camp 201 Mart Building, El Paso—one Bell 47G.
Caprock Helicopters Inc O'Donnell—one Hughes 269A.
CLL Corporation Box 2144, Amarillo—one Brantly B2.
Coldwater Cattle Company Box 2861, Amarillo—one JetRanger.
Colorado Interstate Gas Company PO Box 137, Masterson—one Bell 47G.
Continental Copters Inc PO Box 13284, Fort Worth—one Bell 47G, one El Tomcat.

Continental Oil Company Box 2197, Houston—three JetRanger, three Bell 47J.
Louis W. Cottriel 1105 SE 14th Street, Mineral Wells—one Bell 47D.
Cutter Flying Service Inc PO Box 218, El Paso—one Hughes 269A.
Department of Public Safety Tims Airpark, Austin—two Bell 47G.
Forge Construction Company Box 6755, San Antonio—one Hiller UH-12A.
Foreign Mining and Minerals Inc Tennessee Gas Building, Houston—one Hiller UH-12.
Gardena Valley Airport Inc PO Box 208, Sharp Field, Leakey—one Hughes 269A.
H. M. Gebo Plainview—one Hughes 269A.
Great Southwest Corporation PO Box 191, Arlington—two Brantly B2, one Bell 47G.
Green Giant Helicopters Inc Lubbock—one Hughes 269.
Helicab of Texas 130 South Terminal Drive, San Antonio International Airport—one Sikorsky S-52, one Sikorsky S-55, one Hiller UH-12, one Bell 47G, one Hughes 269A, one Brantly B2B, one Carson C-4.
Helicopter Sales of Louisiana PO Box 60396, Houston—three Hughes 269.
Helix Air Transport Inc 9300 North C Expressway, Dallas—three Bell 47G, one Bell 47J.
H & H Music Company 1211 Caroline Street, Houston—one Bell 47G.
Hiller Piper Aircraft PO Box 1145, Nederland—one Bell 47G.
C. C. Holt PO Box 12248, Houston—one Brantly B2.
Houston Aircraft Inc Houston—one Hughes 269A.
Houston Beechcraft Inc 9011 Randolph, Houston—one JetRanger.
Houston Helicopters Inc Pearland Airport, Houston—one Bell 47D, four Bell 47G.
Houston Metro Airlines PO Box 58290, Houston—six Bell 205A.
Hughston Flying Service PO Box 305, Los Fresno—one Brantly B2.
Humble Oil and Refining Company PO Box 2180, Houston—three Sikorsky S-62.
International Pipeline Associates 1517 Levee Street, Dallas—one Bell 47G.
Inter American Alrmotive PO Box 313, Arlington—one Bell 47G.
K-Copters Inc 1334 South Irving Heights Drive, Irving—two Bell 47D, three Bell 47G, one Bell 47H, one Bell 47J.
Billy John Koonsman Snyder—one Hughes 269.
Lakeside Irrigation Inc PO Box 337, Eagle Lake—one JetRanger.
LTV Aerospace Corporation PO Box 5907, Dallas—one Sikorsky S-58B.
Robert S. Macy Post—one Hughes 269.
Robert Masterson III Gurhrie—one Hughes 269.
C. H. McCan PO Box 1159, Victoria—one Bell 47G.
Henry C. McDonald 918 Eighth Avenue, Fort Worth—one Brantly B2.
John Mecom Box 2566, 1500 Grey Street, Houston—one Hiller UH-12B.
Monahan Helicopter Service PO Box 36, Westmore—one Bell 47D, two Bell 47G.
Moore Research Laboratory 7444 Calhoun, Houston—one JetRanger.
Nasa, Manned Spacecraft Centre Houston—one Bell 47G.
Nayak Aviation Corporation San Antonio—one Hughes 269A.
Norman & White Aero Service PO Box 569, Edinburg—one Bell 47G.
Dennis O'Connor 400 Victoria Bank & Trust Building, Victoria—one Bell 47G, one JetRanger.
Tom O'Connor Jr 400 Victoria Bank & Trust Building, Victoria—one JetRanger.
Placid Oil Company First National Bank Building, Dallas—one JetRanger.
Plains Helicopter Company Route 2, Slaton—two Hughes 269A.

Putz Aerial Service Box 425, Mission—one Bell 47G.
Rio Valley Aero Box 3389, McAllen—one Hiller UH-12B.
Rotor-Craft Inc PO Box 16123, Collier Airport, Houston—one Brantly 305, one Brantly B2B, one Bell 47J.
Rowan Air Cranes Houston—two Sikorsky S-64E Skycrane.
Rowco Inc Route 13, San Antonio—two Bell 47G.
Scarborough Aviation Inc Route 2, Foster Field, Victoria—one JetRanger, one Bell 47G.
Don Sheppard Box 12248, Houston—one Brantly B2.
Sky Farm Equipment Corporation Box 323, Edinburg—one Bell 47G.
Southwest Air Rangers of El Paso Inc El Paso—one Hughes 269A.
M. H. Spinks Enterprises Inc Oak Grove Airport, Fort Worth—two Bell 47G, one Bell 47J, three Hughes 269A.
Tenneco Inc PO Box 2511m, Houston—five JetRanger.
Tennessee Gas Pipeline Company 9001 Randolph Street, Houston—one JetRanger.
Texas Gulf Sulphur Company Newgulf—three Bell 47G, one Hiller UH-12E.
Tide Equipment Inc PO Box 3612, Corpus Christi—two JetRanger, five Bell 47J.
Trans-Continental Helicopters Inc 7601 Gulf Freeway, Houston—two JetRanger, one Sikorsky S-55, two Bell 47G, one Bell 47H, one Bell 47J.
Trinity Valley Helicopters 602 Morning-side Drive, Mineral Wells—one Hiller UH-12C.
Universal Helicopters Inc Box 1498, Pecos—four Bell 47G.
Valley Ag Rotors Harlingen Airport, Harlingen—one Bell 47D.
Virdell Taylor Llano—one Hughes 269A.
W. T. Waggoner Estate Vernon—one Bell 47G.
P. H. Welder Box 1160, Victoria—one FH-1100, two Bell 47G.
Western Flying Service Inc Box 1498, Pecos—one Bell 47G.
James A. Whittenburg III 736 Amarillo Building, Amarillo—two Bell 47G.
Lawrence Wood Refugio—one Hiller UH-12A.

UTAH

Aerial Applicators Inc 2382 West 580 North, Salt Lake City—two Bell 47G.
Edward C. Caulfield 43 Guest Avenue, Salt Lake City—one Bell 47G.
Construction Supply Company 1919 West North Temple, Salt Lake City—two Bell 47G.
Key Aviation Inc Salt Lake City—one JetRanger, two Bell 47G.
Richard D. Moody RFD 1, Delta—one Bell 47G.
Mountain West Helicopters Inc PO Box 691, Provo Municipal Airport, Provo—one JetRanger, one FH-1100, one Bell 47J, 10 Bell 47G.
Utah State University Logan—one Sikorsky S-51.

VIRGINIA

Aerial Services Corporation PO Box 4217, Roanoke—one Sikorsky S-58, two Sikorsky S-55, four Bell 47G.
Airbyte Helicopter Corporation PO Box 457, Danville—one Brantly B2.
Clinchfield Coal Company Dante—one JetRanger.
Colonial Helicopters Inc 301 West Indian River Road, Norfolk—four Bell 47G.
Copters Inc Municipal Airport, Norfolk—one Bell 47G.
W. Haggin Perry Racing Stable Middleburg—one JetRanger.

WORLD HELICOPTER MARKET...

Industrial Aircraft Corporation 315 Woodland Drive, Newport News—one FH-1100, three Bell 47G.

Kel-R-Copters 6242 Indian Run Parkway, Alexandria—one Brantly 305, one Brantly B2B.

Nasa, Langley Research Centre, Hampton—one Bell 204B, one Bell OH-4, one Bell OH-13.

Penn Virginia Corporation Big Stone Gap—one JetRanger.

Potomac Industries Inc 3301 Pickett Road, Fairfax—one Enstrom F-28A.

Preston Construction Company 333 South Glebe Road, Arlington—one Hughes 269.

Richmond Aviation Byrd Field, Sandston—one Bell 47G.

State Police Department Richmond—two FH-1100.

Jack Stone Company 3000 South Eade Street, Arlington—one Hughes 269.

Triangle Airways Inc Washington-Virginia Airport—three JetRanger.

Allan E. Turner Company 2134 North Upton Street, Arlington—one Enstrom F-28A.

Wekondo Helicopter Service Box 544, Petersburg—one Bell 47G.

WASHINGTON

Agro Copters Inc 8333 Perimeter Road, Boeing Field, Seattle—four Bell 47G.

Alpine Helicopters Inc 22430 Cedar Grove Road, Maple Valley—four Bell 47G.

Harold M. Anderson Sumner—one Hughes 269A.

Bel-Air Copters Inc 1212 South 80th Avenue, Yakima—one Bell 47G.

Blue Mountain Aviation Route 4, Walla Walla—one Hughes 269.

C. & J. Rotorcraft Company 11409 SE 284 Street, Kent—one Sikorsky S-55.

John Cannaday 2500 Virginia Avenue, Washington—one Hughes 269A.

Car's Helicopters PO Box 790, Pomeroy—one Bell 47G.

Cascade Helicopters Inc PO Box 1316, Chelan—five Bell 47G.

City of Seattle 301 Seattle Municipal Building, Seattle—one Bell 47G.

Coast Charter PO Box 98243, Des Moines—one Hughes 269A.

Don Coleman Centralia—one Hughes 269.

Bruce A. Coombs Yakima—one Hughes 269A.

Curtis Brothers Furniture 2041 Nichols Avenue, SE Washington—one Hughes 269.

Cushing Aircraft Company 4015 Hampton Way, Kent—one Sikorsky S-55, one Bell 47G.

Department of Natural Resources Route 13, Box 62, Olympia—one Bell 47G.

Stanley W. Donogh 9415 Lake Washington Boulevard, Bellevue—one Hughes 269.

Emco Helicopter Company Bellingham Airport—one Bell 47D, two Bell 47G.

Empire Helicopters E 6407 Ruther Avenue, Spokane—one Hiller UH-12C, two Bell 47G.

Farm & Forest Service Box 404, Napavine—one Bell 47G.

Greenline Leasing Company Kenmore—one Hughes 269.

J. E. Hall Contractors E 6200 Alki, Spokane—two JetRanger.

Halvorson-Lent 4110 Stoneway North, Seattle—one JetRanger, three Bell 47G.

Harbor Helicopters Inc Hoquiam—one Hughes 269A.

Helicopter Services Company 2108 West Washington, Yakima—10 Bell 47G.

William B. Johnson 144 Mountain Circle, Sumner—one Bell 47G.

John Kilburn Royalton—one Brantly B2.

Knowles Equipment Company PO Box 68, Bothell—one Bell 47G.

Lake Aero Service Tacoma—two Hughes 269A.

Moses Lake Air Service Moses Lake—one Bell 47D.

Olympic Helicopters Inc 8241 Perimeter Road, Boeing Field, Seattle—one Sikorsky S-55, one Hughes 500, three Hughes 269.

Pioneer Development Corporation 131 SW 156th Street, Seattle—one Bell 47G.

Allan K. Platt Company PO Box 956, Chelan—one Bell 47G.

L. M. Potter 12705 Shorewood Drive SW, Seattle.

Power City Construction and Equipment Company PO Box 3165, Terminal Annex, Spokane—one JetRanger.

Henry W. Saari Bellevue—one Hughes 269.

Seattle Air Charter 8245 Perimeter Road, Boeing Field, Seattle—one Hiller UH-12A.

Seattle Helicopter Airways PO Box 908, Bellevue—one Bell 47G.

Seattle Police Department Public Safety Building, Seattle 4—one Bell 47G.

SkyCrane/Jet Air Corporation Snohomish County Airport, Paine Field, Everett—one Bell 205A, one JetRanger.

Sky Ranch Aviation Tonasket—three Bell 47G.

Ben T. Sprague Route 1, Snohomish—one Hiller UH-12B, one Bell 47G.

Carl W. Strever RR3, Stanwood—one Hiller UH-12.

T & D Helicopters Inc PO Box 86, Grandview—one Bell 47G.

Thunderbird Aero Enterprises Inc Snohomish County Airport, Everett—one Brantly B2.

Truck Rentals Inc 1900 First Street South, Seattle—one Bell 47G.

Vertex Helicopters Chehalis—one Hughes 269A.

Edward R. Volkstorf 8822 East 10th Street, Bellevue—one Bell 47G.

Waitsburg Helicopter Service Route 2, Waitsburg—one Bell 47D, one Bell 47G.

Washington State Aeronautics Commission 8600 Perimeter Road, Boeing Field, Seattle—one Bell 47H.

Wasser and Winters Inc Longview—one Hughes 269.

Clair Wayne Co-operative Wellpoint—one Brantly B2.

Wen-Air Service Route 1, Hartline—one Bell 47G.

Western Aircraft Corporation Felts Field, Spokane—one Hughes 269A.

Wright Company Tacoma—one Hughes 269A.

WEST VIRGINIA

Gilbert Lumber Company Gilbert—one Hughes 269A.

Helicopter Patrol Inc PO Box 126, Bridgeport—one Alouette II, five Bell 47G.

Rotorcraft Inc Elkins—two Hughes 269.

WISCONSIN

Timothy H. Anderson 2904 Hyacinth Avenue, Janesville—one Bell 47.

John T. Bourn Route 1, Woodville—one Hughes 269A.

Dairyland Power Cooperative La Crosse—one JetRanger.

Helicopter Airways of Wisconsin Inc 1101 South 41st Street, Milwaukee—one Brantly 305, one Brantly B2B.

Johnson Air Interests Inc 1525 Howe Street, Racine—one JetRanger.

Midwest Airways Inc Howell Avenue, Milwaukee—one Hughes 269A, one Enstrom F-28.

Midwest Helicopter Service Inc 129 Court Street, Janesville—one Bell 47G.

Omniflight Inc PO Box 31, Janesville—eight Bell 47G, two Bell 47J.

WTMJ Radio Milwaukee—one Brantly B2.

WYOMING

Avery Aviation Inc PO Box 391, Greybull—one FH-1100, two Kaman HH-43A, three Hiller UH-12.

Laramie Aviation Inc Laramie—one Hughes 269A.

Seven Up Ranches Inc Arrada—one Hughes 269.

Roger M. Tetzner Greenbay—one Hughes 269.

John Van Vleet North Lake—one Brantly B2.

URUGUAY

Aviacion Naval Aduana 4, Montevideo—two Bell 47G.

Aviansa Casilla Correo 150, Convencion 1319, Montevideo—one Hughes 269.

Fuerza Aerea Uruguaya Avenida Pedro de Mendoza 5553, Montevideo—one Bell OH-13G, two Hiller H-23F.

VENEZUELA

Aeroservicios Bolivarianos SA (Aerobol) Apartado 2021, Avenida la Estancia, Oficina 1550, Caracas—three Hiller UH-12C.

Aerotecnia SA Apartado del Este 4017, Caracas—twelve Bell 47G, two Bell 47D, two Bell 47J.

Fuerza Aerea Venezolana Edificio Fundacion, La Salle, Caracas—four Sikorsky S-55, 20 Alouette III, three Bell 47G, three Bell 47J, two Sikorsky S-51.

Ministerio de Comunicaciones Esquina de Carmelitas, Avenida Urdaneta, Caracas—one Hiller UH-12E.

Ministerio de Obras Publicas Edificio Halven, Oesq de Monroy, Caracas—one JetRanger.

Orinoco Mining Company Puerto Ordaz, Estado Bolivar—one Bell 47G.

Proteccion Aerea Nacional CA Aeropuerto Guanare—four Bell 47G, one Hughes 269A.

Starvenca Santa Barbara del Zulia—one Brantly B2B.

Trans-Caribbean SA Caracas—one Bell 47.

VIETNAM (North)

Vietnamese People's Air Force Hanoi—20 Mil-1, Mil-4, six Mil-6.

VIETNAM (South)

South Vietnamese Air Force SP3011, Saigon—30 Bell UH-1H Iroquois, 80 Sikorsky CH-34, two Alouette II, two Alouette III. On order: 100 UH-1H Iroquois.

YEMEN

Yemen Airlines Main Street, Taiz—two Mil-1, two Mil-4.

Yemen Republican Air Force Taiz—Mil-4.

ZAMBIA

Autair Helicopters (Africa) Ltd PO Box 990, Lusaka—two JetRanger, four Bell 47G.

(An associate company of Autair Helicopter Services Ltd of the UK.)

International Red Locust Control Service Abercorn—one Hiller UH-12E.

Tazama Pipelines Ltd Lusaka—one JetRanger, one Bell 47G.

Zambian Air Force Lusaka—On order: A-B205.

Letters

The BAA and General Aviation

Sir.—I read with interest the recent correspondence in *Flight* about the attitude of the British Airports Authority towards general-aviation aircraft, culminating in Mr Peter Masefield's letter in which he reaffirmed the policy of the BAA in continuing to extend full facilities to light aircraft. Unfortunately, this does not seem to be echoed by his operational staff who are faced with the very real day-to-day immediacies of running international airports.

Gatwick is the only BAA airport with any volume of light-aircraft movements—indeed they constitute a large part of the total. With its convenient location for Europe and its met and Customs facilities, it is probably the only BAA airport in which light aircraft are interested, yet it is in many ways that which is least suitable. It is London's No 2 airport; it has but the single runway; airline traffic is growing fast; and if it is closed, even briefly, delays involving immense cost occur to the airlines and the community. The situation must surely become progressively worse. It seems clear to me that the time is approaching when restrictions, initially at peak periods, must be applied to light aircraft at Gatwick. And then bang goes Mr Masefield's policy of goodwill.

Let me hasten to say that Mr Masefield's attitude is commendable: he is certainly the champion of light aviation, and what will happen to light aircraft at the major airports when he moves on I dread to think. What I should like to see is the BAA operating a small, low-cost, general-aviation airfield at some convenient point south of London. This would have the immediate effect of relieving Gatwick of most general-aviation traffic, and would appear sound economics in view of the costly facilities and capacity at Gatwick, which are increasingly used by aircraft contributing nothing to the revenue (this should appeal to citizen Lucking!).

Redhill would seem an obvious choice—it could operate as an outstation of Gatwick in most senses, with met facilities provided by closed-circuit television, and could doubtless draw upon Gatwick for Customs and associated facilities. It could also use certain of the Gatwick ATC facilities, such as approach and departure radar. Properly equipped with civilised facilities, I imagine that the airfield would attract various aviation tenants and would soon become self-supporting, while making a definite contribution to general aviation as a whole. If not Redhill, Blackbushe has three good runways and would make a good alternative.

This type of arrangement has operated very well for some years in Sydney, where Bankstown with DCA facilities provides very well for all general-aviation traffic and for unrestricted training traffic. It has three parallel main runways catering for touch-and-goes, landings and take-offs, respectively.

Ashted, Surrey

M. TAYLOR

TSR.2: RIP or Resurrection?

From Prince Geoffrey Galitzine

Sir.—With the recent change in the political leadership of this country, is not this the time for the reconsideration of certain projects in aviation abandoned by the last Government? I speak in particular of the ill-fated TSR.2. Are there, perhaps, any grounds for hope that it might be raised from the dead?

There would, of course, be immense difficulties, not least the complete retooling involved; but for an aircraft

with its initial flight test phase successfully behind it these would surely not be technically insurmountable. In addition, it is well known that the F-111 is encountering ever more problems and TSR.2 therefore, even at this late stage, might not be so very far behind. Does not the whole proposition begin to look more attractive?

The main consideration, at this time, would be one of cost. The figures are too well known for me to go into now; suffice it to say that a considerable amount of taxpayers' money would have to be spent before the aircraft entered squadron service. But the long-term benefit to the defence of this country, not to mention the immediate life-saving effect on an aerospace industry desperately in need of the military contracts it must have to exist, would be incalculable.

The problems would be considerable but for both economic and security reasons we should ask ourselves whether, in fact, we can afford not to resurrect this remarkable aircraft.

Ardleigh, Essex

GEOFFREY GALITZINE

King's Cup Credits

Sir.—Although I thought your reporting of the King's Cup and Formula One air races, both from a general viewpoint and with particular reference to your own Baron's participation, was both interesting and informative, I hope you will not mind my writing to you about what I felt was a small (albeit important to us) omission.

Ever since we took over the operation of this airport it has been our policy to resurrect its original title of Nottingham in preference to Tollerton, particularly as we understand there is another village of this name in the United Kingdom, and of course Nottingham is the major city it serves. However in your editorial, especially in the introductory paragraphs, there was no reference to the venue of the King's Cup at all and it was only later on in the article that the word Tollerton was introduced—similarly in the account of *Flight's* progress.

Although our company was acting in the role of hosts and ground organisers we perhaps could not expect this to be mentioned, but the fact this important race had moved back to the Midlands after a year in the London area we felt might have been worthy of note. Also, we do believe that the sponsors, John Player & Sons, should not be forgotten, for it has been proved in the past that without their very generous support for the cost of staging this quite expensive weekend it is not a viable proposition to depend on spectator income alone.

Anyway, I was glad to note from your correspondent's account that he found the organisation excellent and trust you will not mind my making the above comments.

Nottingham Airport

D. C. TRUMAN,

Managing Director,
Truman Aviation Ltd

Wrong Conversion Factor?

Sir.—Volpar may have carried out some fairly spectacular conversions on Beech 18 airframes, but I doubt if they have done anything as drastic as a conversion to a Fairchild C-123 Provider, as was implied by the caption on page 101 of your issue for July 16.

Aberdeen, Scotland

GORDON J. DORWARD

DIARY

- Jul 30- BLAC: Summer Convention and Flight Proficiency Clinic; Cranfield, Beds.
- Aug 2 Old Warden Flying and Parachute Group: competitions and aerobatic display; Old Warden Aerodrome, Biggleswade, Beds.
- Aug 2 Panshanger Air Pageant; Welwyn Garden City, Herts.
- Aug 7-9 Canada's 1970 National Air show; Abbotsford.
- Aug 8-9 International air rally "Vins d'Alsace", Colmar, France.
- Aug 11 SLAET (Oxford Area): "The Harrier," by Sqn Ldr Lecky-Thompson; 7.30 p.m., Oxford Airport.
- Aug 1-7 EAA: annual convention and fly-in; S. J. Wittman Airport, Oshkosh, Wisconsin.



MOON-LANDERS THEN AND NOW

Almost exactly a year ago, on July 20, 1969, the three American astronauts Neil Armstrong, Edwin Aldrin and Michael Collins were engaging in the greatest of all technological ventures—the first landing on the Moon. A year later the team has split up, only one member remaining on the "flight line."

Neil Armstrong, commander of the Apollo 11 flight and first man on the Moon, became Deputy Associate Administrator for Aeronautics at Nasa from July 1 this year. At a time when both public opinion against high-cost projects and a mutually regressive financial situation militate against aerospace, the move is clearly aimed at promoting aviation (and particular commercial-aircraft research) to Congress and the American public. Armstrong will oversee advanced research into projects such as quiet, smokeless engines, VTO aircraft and the space shuttle.

Edwin Aldrin continues his career at the Manned Spacecraft Centre as a first-line Apollo crewman in the corps of astronauts.

Michael Collins, who kept watch over the landing from his station in orbit around the Moon, is now Assistant Secretary of State for Public Affairs; he was appointed to this State Department post, with effect from January 6, last, by President Nixon.

APOLLO 14 GOES BACK

Spacecraft changes to overcome the faults which nearly cost the lives of the Apollo 13 crew last April have forced a postponement of America's next Moon landing flight to January 31 at the very earliest. In a recent statement the Nasa Administrator, Dr Thomas Paine, said that the command and service module systems will be changed to eliminate the potential combustion hazards in high-pressure oxygen equipment revealed during the investigation of the Apollo 13 accident. In addition a third oxygen tank will be added to the service module so as to avoid operating at low oxygen levels, and making possible the removal of unsealed fan motors in the tanks.

Other changes include the stainless-steel sheathing of electrical wiring, and the use of Teflon and aluminium will be kept to a minimum. Warning systems on the spacecraft and at the Mission Control, Houston, are to be modified in accordance with the recommendations of the Review Board to provide more immediate and visible warnings of fault conditions.

A copy of the Apollo 13 Review Board Report has been sent to Academician M. V. Keldysh of the Soviet Academy of Sciences.

Dr Paine said that the proposed changes will cost between \$10 million and \$15 million, but bluntly reminded the Senate Space Committee that fuel tank problems would not remove all hazards from the project.

Apollo 14 will land in the Fra Mauro region, the objective selected for the near-catastrophic mission last April. Its crew will be Capt Alan B. Shepard USN Commander, Maj Stuart A. Roosa, USAF Command module pilot, and Cmdr Edgar D. Mitchell, USN lunar module pilot.

Postponement of Apollo 14 will also affect the flight date for Apollo 15, which goes back to July or August next year, so as to maintain an approximately six-month interval between flights.

DEEP SPACE NETWORK EXTENDED

Construction has begun in Spain of a 210ft antenna which will form the third and final link in the Nasa Deep Space Network's chain of powerful trackers. The new antenna is sited 40 miles west of Madrid, where three 85ft dishes are already operated jointly by the Space Agency and the Instituto Nacional de Technica Aeroespacial. Another 210ft dish is at present under construction at Tiddinbilla, near Canberra.

Beginning in 1973, the new antenna will, together with the two other dishes, enable the DSN to maintain a 24 hour communication with unmanned spacecraft as far out as the boundaries of the solar system. At the present time very careful flight planning is necessary to ensure that crucial events (such as the flypast of Mars by the two Mariner spacecraft last year) occur when the spacecraft is accessible to the 210ft dish at Goldstone, and this can impose quite severe constraints.

The extension of the DSN is a significant pointer to the increased importance and frequency of planetary exploration. Next year sees the flight of the two Mars-orbiting Mariners, while the first of two Pioneer Jupiter probes will be launched in 1972.

In the following year a flight to Mercury, using (for the first time) the gravitational attraction of outer planets to reduce launch power demands, will put unmanned probes nearer the Sun than any previously. In 1975 a major project, Viking, will soft-land instrument payloads on Mars, while in 1977-78 it is expected that the Grand Tour Spacecraft will make the first reconnaissance of the solar system, taking in Jupiter, Saturn, Uranus, Neptune and possibly Pluto. But Nasa is not the only customer for deep-space tracking services. Germany has for long been known for its close interests in these, literally, far-out missions, and one of them—the solar probe Helios—is in the firm planning stage. It is also possible that this ambitious country will develop a Jupiter spacecraft.

In addition to their main task, the "210s" will be used in future manned missions; the Goldstone dish was used to relay TV from the first Moon landing, and vital communications during the Apollo 13 emergency.

POLLUTION SENSOR

As part of the national attack on the problem of atmosphere pollution Nasa's Langley Research Centre has begun development of a satellite-borne sensor to measure the concentration of carbon monoxide in the Earth's atmosphere. It is estimated that about 500 million tons of this poisonous gas exists in the atmosphere, while industrial activities (and particularly motor-ing) add a further 200 million tons per year. But the concentration of the gas, measured over a period of years, has apparently not increased so that some form of mechanism must exist for the removal of most or all of this annual generation.

The Langley sponsored experiment—the research is actually being made by General Electric under a \$1,077,000, 30-month contract—is designed to map the distribution of carbon monoxide over a period of one year. In this way it is hoped to identify the "sink" into which, presumably, the gas is converted into another compound. Unless the mechanism can be identified, there is no way of predicting whether the concentration of carbon monoxide will increase in the future, or by how much.

LONG-LIFE BALLOON

A balloon released on May 26, 1969, during an experimental CNES (the French national space establishment) venture was still operational and transmitting signals on May 28 last. The aim of the programme was to check the life of balloons which are under development in support of Eole, the French project to map the wind circulation in the southern hemisphere by monitoring the drift of 500 balloons over a long period. Each balloon will carry a tracking beacon, and data will be collected and relayed to Earth by an Eole satellite beginning next year.

The balloon was inflated to about 200mb, was designed to operate at levels of between 39,000ft and 45,000ft and was 13ft in diameter. It was the first time that a long-duration balloon released with a pressure of less than 200mb has existed for over a year.



Straight and Level



YOU'RE not getting confused by all those RB.211 designations are you? Good heavens, it's really perfectly straightforward.

The standard engine is for the Lockheed TriStar, and this is the 40,000lb-plus RB.211-22. About two years ago a higher-powered development, the RB.211-28, was projected for the long-range TriStar and for the A-300B. But what was really needed was a completely new 50,000lb-plus engine. So the -28 became the -50.

Another developed version of the -22, the -47, was offered for the BAC Three-Eleven. But again more power was required, so the -47 was dropped and the -50—the same engine as for the long-range TriStar—was offered for the Three-Eleven (are you still with me?) but as this was going to cost another £100 million it was thought desirable to look at developing the -22 again by adding stages rather than by general sizing up.

This led to the -50A. But this caused confusion with the -50A version of the General Electric CF6 (well it would, wouldn't it?) which was fitted to the A-300B in place of the RB.207. So the -50A was renumbered -61. All right now?

Thinks: If only Rolls-Royce had built the RB.207 in the first place.

MOST aircraft in the 1990s will require long and straight runways at major airports, writes Mr

From "The Daily Telegraph", June 9

● I wish I could follow the logic of the argument that Rolls-Royce is too much run by engineers, and that the addition of financial experts to the board is a Splendid Thing.

Financial success in technology depends upon correct judgments being made about technology. Of course you need finance—very high finance indeed, these days. But success begins and ends with correct technical judgments. Only engineers who have spent a lifetime in the market can make these, and determine the financial risk.

Welcome anyway to the new financial incumbents of the Rolls-Royce boardroom. The Silver Goddess has been very brittle of late. I hope she is feeling better now. May her virtues always be engineering ones.

● Reading of the award of the AFC to an RAF flying instructor who landed a badly damaged Varsity after a mid-air collision with a civil trainer, I read in the MoD press release that the incident



A double cognac, please . . . (Bretagnes made into a bar in France)

happened at 2,500ft "and still in the Oakington Military Air Traffic Zone."

Steady chaps. What, I wonder, has that to do with the award—well deserved as it is? I haven't heard the outcome of the investigation into this particular incident yet.

● I took the family to Devon for a few days. It was Mayflower Week in Plymouth—you know, the place named after Plymouth, Massachusetts—and it was crammed with Americans. It was Royal Air Force Week as well, and there was a Spitfire Mk1A on the Hoe and at 7 o'clock a display by the Red Arrows.

The setting could not have been more perfect: the beautiful and historic Sound, little boats on the water, and a perfect summer's evening.

I gasped at the Arrows' display, even though I have seen them so often. So did everyone. The best view of all must have been from Albacores (dinghies, laddie) which were trying to race. I swear that during the final cross-over and pull-up Gnat blast actually parted the waters of the Sound.

My respects and thanks to the Red Arrows for the finest of fine airmanship.

● Hendon—ah Hendon! As I passed in the train I saw that sacred turf, skimmed by so many roundelled, silver wings, being ravished by earth movers, pile drivers, stacks of bricks and workmen's huts.

I saw the ghost of a Gamecock attacking a bulldozer, a Blenheim bombing the site manager's office, a Fury buzzing a crane jib.

There was still a bit of the threshold of a runway to be seen and—ah! those two original hangars were being converted into the RAF Museum. Workmen were swarming on the scaffolding of the adjoining new buildings. Honour is being done to all that Hendon ever stood for, and more.



There there, have a good cry and tell me all about it

● With Hendon has departed the epoch of the great aircraft masters—men like Camm, de Havilland, Mitchell. Advancing technology demands specialisation and teamwork. But we still need men with the common technical touch and all-round training to lead and control the specialists.

Computers and parametric studies and avionics don't make good aeroplanes. They help. But more than ever we need technical leaders who, like the old masters, mind the simple engineering virtues.

● From an article in *The Sunday Times* for July 12 proposing an airport in London's Hyde Park:

"A landing or take-off accident at Westminster Airport might kill scores of people living close to the airport. But this, too, appears insignificant. The report anticipates only one 'third-party' accident over 30 years and the costs assumed are only £9,300 for each fatality and £625 for each injury."

Let's get cracking then, as we used to say in structural test.

Roger Bacon



Aircraft For Sale

HERCULES LI00-20LR FOR LEASE OR CHARTER

TO SHIPPERS WITH AN
OUTSIZE PROBLEM IN CARGO



Clarkair are now able to offer continuous availability on these super cargo carriers which can accommodate 2 standard $8 \times 8 \times 20$ feet containers. Fully wet lease or any period time-charter. Specialist staffed heavy lift team available on 24 hour basis to advise on your problems.

Clarkair INTERNATIONAL LIMITED

OFFERS COMPLETE WORLD WIDE CHARTER SALE AND PURCHASE FACILITIES

CLARKAIR HOUSE, 85 TOOLEY STREET, LONDON, S.E.1.

Tel: 01-407 8831

Telex 884855

Overseas Offices: AMSTERDAM, NEW YORK, MONTREAL, MIAMI, SYDNEY, RIO DE JANEIRO, HONG KONG, BANGKOK, BEIRUT, MUNICH, BOGOTA



BOEING 727-100

We can offer immediate delivery of 1 Boeing 727 series 100.
Total time since new 10,850 hours, engines 3,800 hours since overhaul.
Currently equipped with 119 seats, will alter to suit customer
PRICE £1,340,000

Terms available over 6 years.

Full pilot and engineer training available.

TEMPLEWOOD AVIATION LTD.

AIRCRAFT LEASING AND SELLING SPECIALISTS
3 HIGH STREET, WINDSOR, BERKSHIRE, ENGLAND.
Telephone: WINDSOR 66811/66812 Telex: 84518 Cables: Tempair, Windsor.

**Rogers
for
Cessna**

Aircraft of the week JODEL D 140A

Total time: 1,425. Engine: 1770 left. ABAC. C of A to July 1971.
Narco Mk. 12A. VHF/VOR. Full panel. Full dual control intercom.
A comfortable five seat S.T.O.L. aircraft which cruises at 135 m.p.h.

Only £4,800

Call Eric Jackson at Bedford 62441 for full specifications.



ROLLS
ROYCE
CONTINENTAL
SERVICE
CENTRE



ROGERS AVIATION LIMITED

Great Barford, Bedford. Tel: Bedford 62441. Telex: 82271

FLIGHT

INTERNATIONAL

PRESS DAY—Classified Advertisements "copy" should reach Head Office by **FIRST POST THURSDAY** for publication in the following week's issue subject to space being available

CLASSIFIED ADVERTISEMENTS

Advertisements Rates 2/3 per word, minimum 27/-, Paragraph is charged separately, name and address must be counted. Semi-display advertisements £9/0/0 per inch depth. All advertisements together with remittance should be addressed to **FLIGHT International Classified Advertisements Dept.**, Dorset House, Stamford Street, London, S.E.1. Telephone 01-928 3333. Telegrams/Telex Hinesapex Ldn, 25137.

Postal Orders and cheques sent in payment for advertisements should be made payable to **FLIGHT International**, and crossed "A & Co".

Trade Advertisers who use these columns regularly are allowed a discount of 5% for 13, 10% for 26 and 15% for 52 consecutive insertion orders. Full particulars will be sent on application.

Box Numbers For the convenience of private advertisers, Box Number facilities are available at an additional charge of 2 words plus 1/- extra to defray the cost of registration and postage, which must be added to the advertisement charge. Replies should be addressed to Box 0000, c/o **FLIGHT International**, Dorset House, Stamford Street, London, S.E.1.

The Publishers retain the right to refuse or withdraw advertisements at their discretion and do not accept liability for delay in publication or for clerical or printer's errors although every care is taken to avoid mistakes.

AIRCRAFT FOR SALE

PETER CLIFFORD AVIATION LTD NEW AND USED AIRCRAFT

OXFORD AIRPORT.

KIDDLINGTON.

Kidlington (08573) 4262

and

WHITE WALTHAM AIRFIELD,
MAIDENHEAD.

Tel: Littlewick Green (063885) 3341.

(0858)

BEAGLE PUP 150 for Sale. Delivered early 1969. 200hr only, C of A Jan. 1971. Every optional extra, including VOR/ILS/ADF/VHF. Transceiver and Glideslope. 4 seats, and long-range tanks. £7,750. Leasing facilities can be arranged. Apply Box 1418/4. (0126)

CHEROKEE 140. New C of A. 4-seater, 2 years old, fully equipped: 2 VOR/ILS/ADF, 2 VHF Receivers, Glideslope, 2 Altimeters; in first-class condition. Offers to Com-Mech Engineers Ltd, Forsyth Road, Sheerwater, Woking, Surrey, Woking 4024. (0127)

TWIN COMANCHE B. June 1969. Full IFR, King DME Altimeter (IL), de-icing, top tanks, Public Transport C of A March 1971. Check IV recently completed. £19,500. Tel: Sutherland, day Station 33911, evenings 01-663 7722. (0672)

AIRCRAFT FOR SALE

MOONEY 20A. Four seats, retractable, C of A until 1971. Full panel, VHF/VOR/ADF, Macross auto-pilot, £3,050. Any car or plane taken in part-exchange. Phone Terry Stewart, 01-852 6171. (1394)

CESSNA 172C. Comprehensively equipped, 1,070 TT. Will demonstrate anywhere. Telephone Blackpool 65902. (1479)

OH DOVE for Lease or Sale
GIPSY QUEEN 70-4 Power Plants in stock
EXTENSIVE DOVE SPARES ALSO IN STOCK
Inquiries welcome

ROGERS AVIATION LIMITED,
CRANFIELD AIRFIELD,
BRIDFORD, ENGLAND.

Tel: Cranfield 661. Telex 82320.

(10219)

JOEEL D112. New C of A, really immaculate; 375 engine hours left. Basic price £2,935. Also surplus: two Super-Beside, Magnificent aircraft with spare engine. Rotterdam Aircraft Foundation, Overmaas Hoflandstraat 53, Pyraeker, Holland. Phone 01738-3361. (1433)

PIPER ARROW. EXEC. TT only 165hr. Fuel in-let, 175 m.p.h., 7.7 g.p.h. cruise. Full airways, 2 VHF/VOR/ILS/ADF, 2 Markers. Auto-pilot - 3, 2 altims. Elec. trim. £2,500. Under list at £11,830. Tel: Haslemere 2273 (Office). (0379)

AIRCRAFT FOR SALE

DH54 MOTH MINOR, built 1936. In excellent flying order, one of few remaining. Permit to Fly to Dec 1970. 140hr to run on Gipsy Minor engine. A very rare aircraft. £1,500. C. Burrell, Dorset Flying Club, Compton Abbas Airfield, Shaftesbury, Dorset. (1533)

HALLYE CLUB. 2 VHF/VOR, full panel, C of A to May 1971, 1,300 engine hours to go. Excellent condition. £2,500. 021-557 2104 (day), evening Wombourne 3147. (1507)

AIR GREGORY LTD OFFER

CESSNA EKINS ROCKET, fully equipped, Cash price £10,550 or lease for 60 months, £210 per month.

ARTEC A-2 VHF/VOR, 2 ADP markers, ILB, propeller de-icing. Cash price £2,900 or lease for 48 months at £202 per month.

CESSNA 172, King KKI100 Nav/Com, very low hours. Cash price £5,250 or lease for 48 months £180 per month.

CESSNA 150, 360-channel Nav/Com, Cash price £4,250 or lease for 48 months £95 per month.

Several other aircraft and helicopters in stock.

Send for latest stock list, or telephone

DAVID GRAYSON DENHAM 2417,

DENHAM ABERDROMIE,

DENHAM

UXBRIDGE,

MIDDLESEX. (1432)

SHACKLETON AVIATION LTD. ESTABLISHED 1930

International DEALERS. THE LARGEST AND BEST KNOWN
AIRCRAFT DEALERS IN THE WORLD

WE PROVIDE FINANCE ON TRANSPORT AIRCRAFT REGARDLESS OF WHERE THEY ARE PURCHASED

Our specialists will produce individual
schemes to suit your particular airline.

Transport aircraft immediately available:

One DC8-31 Passenger Aircraft
\$2,100,000 U.S.

One DC8-34F Pax/Cargo Aircraft
\$4,900,000 U.S.

DC8-50 Passenger Aircraft
\$4,650,000 U.S. to \$4,950,000 U.S.

B707-320C Pax/Cargo Aircraft
\$7,150,000 U.S.

B707-321 Passenger Aircraft
\$2,650,000 U.S.

B720. Fan engines. Passenger Aircraft
\$2,750,000 U.S.

Two B720. Non Fan engines.
Passenger Aircraft
\$1,420,000 U.S. to \$1,540,000 U.S.

Four CL44 Aircraft
\$1,100,000 U.S. to \$1,560,000 U.S.

Britannia 300. Three aircraft. For sale or lease.
BAC 1-11. One aircraft. For wet or dry lease.
Four H.S. AW-550 ARGOSY HIGH FREIGHT
CAPACITY AIRCRAFT. Price subject to configuration.

SPARES

available on BAC 1-11, Britannia & Boeing 707

WANTED

TWO H.S. 748 AIRCRAFT

Specifications and price should be sent to
Head Office.



HANDLEY PAGE AIRCRAFT LTD.

We are officially acting for the Receivers,
Messrs. Spicer and Pagler, in the sale of the
Jetstream aircraft and associated equipment.

Beagle 20A. Executive configurations, Public Transport C of A. Full de-icing system. Dual instrumentation. Sperry Autopilot, RML Full Arc Radio Station, VHF/VOR/ILS, ADF Markers, Elliott intercom. Engine TSO's 225, and 129 hours. Owned by a leading manufacturing company in England and is in very good order. £25,000.
H.S. Dove Mk 6. 6 passenger seats, executive configuration. Public Transport C of A. Toilet, cocktail cabinet. Fully de-iced. Dual instrumentation, Bendix VHF/VOR, Marconi ADF, Collins VOR/ILS, Collins Markers, Elliott intercom. Owned by a leading manufacturing company in England, and is in very good order. £11,000.

Fly above the weather swiftly and economically

Pressurised Prop-Jet Executive Aircraft
Immediately available. Only 700 hours since new. 7 passenger seats. Radar and full airways equipment. Full finance available on direct purchase or lease purchase. As new condition.

TWO TWIN PIONEERS. 17 seat aircraft. Ideal for short field operations. In good order. £12,500 each, with spares package.

Brantley 305 Helicopter. 5 seats. Only 384 hours flown on airframe. New C of A. VHF/VOR/ILS ADF. In very good order. £13,000.

Hiller 12C Helicopter. 3 seats. Public Transport C of A. De lux interior, VHF 360-channel. This aircraft has just undergone a major overhaul, in very good order. £5,950.

FINANCE AVAILABLE ON ALL EXECUTIVE AND LIGHT AIRCRAFT

Head office **170-3 PICCADILLY, LONDON W.1.** Tel 01-493 2448 Telex 263975

PART EXCHANGES SOLE AGENCY SCHEME

AIRCRAFT FOR SALE

T215 GLIDER, 2-seater, with canopy, spoilers and trimmer. Bargain at £350.

Plessey aircraft radio, type T761K, 6 channels, plus spare crystals, overhauled, £75.

PIPER PA 23-150, C of A to Oct. 1971. Engine run 1,000hr since new. Narco 12A 360-channel VHF radio. Excellent order. £1,950. J. S. Thorne, Dorset Flying Club, Crompton Abbas Airfield, Shaftesbury, Dorset. [1534]

CESSNA 150D, Red/white, KY95E. One year C of A left. Full details apply Box 1551/5. [1504]

EMERAUDE (SCINTEX) 99 D.P. Continental half-life engine, 360-ch King radio, VHF/VOR, full panel, long-range tanks, C of A to Feb. 1972. £1,500. 25, Stoneham, 12 Malford Grove, London E18, 01-989 1397. [1535]

RALLYE CLUB 1968, Low hours new 3-year C of A, 360-channel Narco 12A, VOR, full instruments, night flying, including landing lights. Superb condition. £3,500. 70 Hendings Road, Birmingham 13. Tel: 021-448 1003; 021-336 9387. [1516]

JODEL AMBASSADEUR DR 1850, Continental 1,700hr to run, new C of A, 12-channel VHF plus ADP, tinted canopy, immaculate condition. Red and white, £2,575. L. Roberts, 29 Cliffside Road, Hamgate, Thanet SA36. [1576]

TERRIER II, Engine 230hr to go, C of A March '71. Full panel. New prop. VHF. Good condition. £300. Fleet 7432. [1523]

CESSNA 172, 100hr total time, new three-year C of A, airways radio; like new, £7,850. Gen-Avia Ltd, Alexandra House, Guildford, Surrey. Phone Guildford 59001. [1561]

FOR SALE: Rallye Commodore 180, 2 X VHF, 360-channel, 1 ADP type 31, VOR/LOC, twin co-ordinator navigation lights, CB prop, Total hours 220. Nearest offer to £8,500. Carver Ltd, Lichfield Road, Tamworth 3411. [1586]

CESSNA 150G, 360-channel VHF/VOR, full panel, nav. lights, omni-flash beacon, heated pilot, shoulder harness, electric flap, engine 360hr to run, Public Transport C of A expires Feb. 1972. Caramel/white. Well maintained; in excellent condition. Offers MUST sell. West Country Aircraft Service, Exeter Airport, Tel: Exeter 67802. [1587]

AIRCRAFT FOR SALE

GYROPLANE, 1,000cc VW, current permit. Bargain. £235 o.n.b. Part-exchange (fouring aircraft, Markfield 2604. [1532]

TURBO AZTEC C, PA-23-250, (Six place), New Public Transport C of A on 2.7.70. In current use. Total time 600hr airframe, engine and prop. Full airline radio, DME and radar, Oxygen system and full de-icing. Extras include Aero Tractor model 290. Price £30,800 or offer. Hummer Air Services, Tel: Newcastle 809666, or Morpeth 2210. [1553]

SUPER RALLYE 1 or 1 syndicate share available. Based Sywell. Superb condition: 1,100 engine hours left. New C of A, King 380 and stand-by VOR/ADF, ideal STOL aircraft. £850 or £1,100 respectively. Tel: 021-359 1934. [1561]

RALLYE CLUB, C of A to 1972. Perfect condition. £2,995. Weybridge 48344. [1521]

PIPER TRI-FACER 150, C of A to October 1971. Engine top overhauled, 1,000hr to run, fabric renewed last year. Narco 12/VOR, £3,750. Box 1530/5. [1573]

JODEL MUSKATEER D140B, Five seats, full panel, two radios, VOR, total time since new 690hr, recent complete overhaul. £1,500. Terms arranged. Vendor interested in good sea-going trawler part-exchange. 1 Broadway, Grays, Essex. Tel: Grays Thurrock 2041-3062 3744. [1569]

AUSTER J1N, New Public Transport C of A, 4 seats, limited panel, 950hr left on engine. New spare propeller, new upholstery. £795. Phone Locks Heath 2396. [1561]

£525. Tiger Moth DH 82A. Dismantled. Needs C of A. 600hr since engine overhaul.

£325. Jodel D112. Wassmer built, 1,300hr to run on motor. New Propeller. Needs new permit, 110 m.p.h. cruise, 3 g.p.h.

£750. Jodel D117. 90 h.p. Continental with 1,200hr to run. Excellent condition. Needs permit.

£1,895. Cessna 150, 1960, 1,400hr to run on motor. New C of A to your choice. Corrosion proofed, red/white. Full blind flying, heated pilot, rotating beacon. Nav. and landing lights. KY90 90-channel VHF. Really nice example.

COBURN & HUGHES AVIATION, 440 GREEN LANE, LONDON N4. Tel: 01-346 0174. [1560]

AIRCRAFT FOR SALE

CESSNA 33F Super Skymaster, Full airways, de-icing, 370hr TT, £18,750. Bryman Aviation, Tel: Chobham 8110. [1599]

CESSNA Reims Rocket, Full de-icing, Immaculate, 320hr TT, £6,750. Bryman, Tel: Chobham 8110. [1594]

CSE AVIATION LTD

OFFER

PIPER CHEROKEE ARROW, 1968. Sportman group. Auto-pilot, 3 VHF, 2 VOR/ILS, marker ADF. Many extras. Choice of two. £10,750.

CHEROKEE 140, 1968, 1,150hr, Club C of A expires September 1971. Narco 12B, VHF/VOR, Indicator. Four seats. £5,500.

ELING TREEMASTER X 82R, 400hr, KY 00 VHF. Price £5,000.

New Piper Aircraft in stock. Demonstration Aircraft for sale. Prices available on request.

CSE AVIATION LIMITED

OXFORD AIRPORT

KIDDLINGTON

OXFORD

Tel: 088-754321. [1547]

SIAT MARCHETTI S263, Several airline instruments. Based Kistree. £2,300 for 4 share. Contact 01-903 4867. [1560]

1968 PIPER TRI-FACER, 1,300hr to go on engine, new C of A to your choice, low airframe hours, Class 1 VHF and VOR/ADF, vertical camera port and mount. Immaculate. £2,100. P. M. Graham, Auct 21103 or Vatsley 37B3. [1570]

META SOKOL, New C of A, VHF/VOR/ADF, £2,550.

PIPER TRI-FACER, 300 VHF, new C of A, £3,500.

PIPER TWIN COMANCHE, New C of A, low hours, £12,000.

BRIMMER AVIATION, The Aerodrome, Hatrix, Tel: 01 353 4411. [1583]

CESSNA 172, 1967, Blue/white, K380 ADF/VOR/ILS, NKR's, used privately only. Meticulously maintained. The finest on offer. £6,500. Consider part-exchange each ADP for Jaguar X36 or similar. Tel: Hixley (York) 4287. [1589]

NIPPERS, One new and several good second-hand, from £1,000. Nipper Aircraft Ltd, Castle Donington, Derby. Tel: Derby 810779. [1588]

Classified Advertisements continued on page 19

DOUGLAS DC6A/B

One aircraft now available

U.S. \$225,000

For the best choice-an International Broker



DH HERON IB

Two aircraft both equipped with 15 passenger seats

Always a wide selection of aircraft available

BRITANNIA 300

with freight floor and cargo door. Available soon



DISMORE AVIATION LIMITED

175 PICCADILLY, LONDON, W.1
TELEPHONE: 01-629 6966 CABLES: DISAVIA W.1

GLOS · AIRTOURERS



THE SAFEST · THE STRONGEST

LOW RUNNING COSTS

PROVEN
and
IMMEDIATE

Spares Service

STAVERTON
AIRPORT



CHELTENHAM

Telephone:
CHURCHDOWN 3365

FOR SALE



HERON 2D

A unique opportunity to purchase an extremely fine corporate aircraft, which is shortly to be traded in against a new King Air 100. This Heron has been owned by one of the largest corporations in the country and maintained to the highest possible standard. **£25,000**



QUEEN AIR B90

Built 1968. One corporate owner since new and just traded in against a King Air B90. Based in the West Indies and maintained to ARB standards. Comprehensively equipped including Collins avionics with dual ILS, dual ADF, AVO-55 radar, Sunair BSB HF, Oxygen etc. Executive interior with couch and individual seats, toilet and bar. Immediate delivery. **£125,000**

SOLE DISTRIBUTORS

Beechcraft

SALES AND SERVICE



ROLLS-ROYCE
CONTINENTAL
SERVICE CENTRE
PARTS - SERVICE - SALES

**EAGLE
AIRCRAFT
SERVICES**

Contact: A. Panton-Williams,
Eagle Aircraft Services Ltd.,
Leavesden Aerodrome,
Watford, WD2 7BY.
Tel: Garston 75233



BARON B55

A 1964 model shortly to be traded in against a new Baron 56. Company owned and maintained to Transport Category standards. Always radio, full de-icing, six seats, long range tanks, full dual controls including brakes. H-14 autopilot with ILS coupler. One zero time engine. **£19,950**



TRAVEL AIR

1964 model. Always equipped including dual ILS, 3-axis autopilot, de-icing, 5 seats and a host of other extras. Excellent engine and prop. hours remaining. New C of A just issued following check 4 and radio overhaul etc. This model features the fuel injected engines and longer cabin. A much sought after twin. **£16,500**

CESSNA SKYLANE-FOR SPEED & RANGE



LET US DEMONSTRATE IT TO YOU

- Continental 230 hp engine
- 1969 model
- 400 series 360 VHF/VOR
- 400 series ADF
- Constant speed propeller
- Top speed 170 mph
- Cruising speed 160 mph
- Long range fuel tanks
- Range up to 1,200 miles
- Rate of climb 980 ft per minute
- Accommodation for four people plus 120 lbs baggage
- Cash price £11,000 or lease for 60 months at £181 per month.



'PHONE DAVID GRAYSON
DENHAM 2417

AIR GREGORY LTD.

DENHAM AERODROME . DENHAM . UXBRIDGE . MIDDY.

Cessna DEALER

HUGHES
HELICOPTERS

SOLE U.K. CONCESSIONAIRES

Cessna & Hughes
parts in stock.
Maintenance &
C of A.
Air Taxi & Charter

**LULSGATE
AIR
SERVICES
LTD**

advanced Cessna dealers

TEL: LULSGATE 714 or 444 BRISTOL 24401 or 32406 FREQUENCY 127.75

Aviation Consultants. Service department offers quick and efficient service and quality C of A's. Contact Jack Evans for service and Mike Price for sales queries.

All new Cessna singles available immediately		
1969 Cessna 150, 360 VOR	£5,950	from £6,950
1968 Cessna 150, 360	£5,250	£7,000
1968 Cessna 441, Airways, de-icing	£38,350	£10,000
1965 Cessna Skylane, Airways	£7,950	£21,700
1967 Cessna 150, 360	£4,600	£13,000
1967 Cessna 172, Airways	£7,500	£7,990
1968 Cessna 172, 360 VOR/ADF	£6,750	£3,500
1961 Cessna 175, 360 VOR/ADF	£4,475	£17,000
1960 Cessna 337 Skymaster, Airways	£22,000	£2,000
1964 Cessna 338 Airways	£12,550	£2,500
1968 Cherokee 140, Airways	£7,100	£1,150
1967 2 Cherokee 180's, 2/360 VOR		£1,350
1967 Piper Apache Airways		
1965 Twin Comanche, Airways		
New Single Comanche, Airways		
1965 Single Comanche, Airways, DME		
1969 Single Comanche, Airways		
1967 Rallye club 360, VOR		
1964 Beech Travelair, Airways, de-icing		
1961 Jodel 1050, 90 channel full panel		
1964 Beagle Airtale, VOR/ILS/ADF		
1969 Auster Mark 5, Plessey radio, full panel		
Aerobatic Stampe, excellent condition		

FINANCE . LEASING . HIRING . BRISTOL AIRPORT • TWIN AIR TAXIS AVAILABLE . MEMBERS OF A.T.O.A.

Sole Distributors for SUD-AVIATION light Aircraft
AIR TOURING SERVICES LIMITED
 Biggin Hill Airport, Kent.
 Biggin Hill 3652



THE RALLYE MONSUN DIPLOMATE
 ALL ON DISPLAY AT

Biggin Hill Thursday Afternoon 30th July
 Exeter Friday 31st July
 Exeter Saturday 1st August
 Biggin Hill Sunday Morning 2nd August
 Panshanger Sunday Afternoon 2nd August

1 YEARS FREE INSPECTION SERVICE ON ORDERS PLACED DURING THESE DATES.

Name
 Address

THE BA-4B

This superb little aeroplane is now in FULL PRODUCTION at

Crosby Aviation Ltd.,
 Archery House,
 Leicester Road,
 Knutsford,
 Cheshire.

Tel: Knutsford 4254

★ **SENSATIONAL AEROBATICS**
 Effortless Control makes learning (and winning) easy.

★ **ABSOLUTELY MODERN**
 135 mph cruise - 300 mile range -
 starter - 27 mpg - cabin heater -
 all metal.
 Inclusive at
£3,250

★ **FLIGHT CHARACTERISTICS**
 Ecstatic praise by all who have flown it - including Test Pilots and National Aerobatic Champions.

SPORTAIR AVIATION LTD



FOURNIER RF4 AND RF5

The most exciting light aeroplanes available
 Touring ★ Training ★ Gliding ★ Aerobatics
 Unrivalled economy and performance
 C. of A. Quick Delivery. Spares in U.K.

- ★ Free training to PPL for RF5 purchasers
- ★ Free conversion training for RF4 purchasers already holding PPL

Biggin Hill Airfield, Kent. Tel: 3110 & 4717
 (for demonstrations training and spares)
 Luton Airport, Beds Tel: 29684

FLY WITH Cessna
FAIROAKS SCHOOL OF FLYING
 £3. 0. 0. For a trial lesson in a Cessna 150

TELEPHONE: CHOBHAM 8110

FOR CESSNA BUYING

BRYMON AVIATION LTD

FAIROAKS AIRPORT,
 CHOBHAM, WOKING, SURREY.

NEW & USED AIRCRAFT
 AVAILABLE FOR
 IMMEDIATE
 DELIVERY

CESSNA
 DEALERS
 FOR
 SOUTH WEST
 ENGLAND



CHARLOTTE AIRCRAFT CORPORATION

Your best source for Jet Engines-QECs. Outright sale, lease, lease-purchase. Favourable financing available

JT3D-7 for DC-8-42 & 63
 JT3B-18 for DC-8 & Boeing 707
 JT8D-7 for DC-9
 JT3D-1 for Early Fan Model

FOR GREAT SAVINGS CONTACT

Box 9127, Charlotte, N.C. 28205 USA
 Telephone: Area 704 537-0212
 Telex: 57-5151 Cable: AIRCHAR

FOR SALE OR TRADE

Blenheim Bolingbroke MK4
 Lysander

F.G.I.D. Corsair - F86 Sabre

Will sell outright any of the above or take other types of World War II aircraft in trade.

Apply to:- **FLYING ENTERPRISES**
 168 W. CLARKE AVE., COLDWATER,
 MICHIGAN 49036 U.S.A.

Tel:- (517) 278-5702

DOUGLAS DAKOTA C-47

Dakmaster 36 seats

Check 4 completed July 1969; Viscount type seats on Vickers rail; Freight door; Mallison floor; Transair V.C. door modification; C. of A. expired; Engine hours since overhaul port 556, stb. 298; Completely refurbished interior; Full airways equipment. **£13,500**
 Box 1629/5

DOVES & C47 (Passenger & Freight) for CHARTER or LEASE UNDER B.O.T., A.O.C

FAIRFLIGHT (Charters) Ltd

BIGGIN HILL AIRPORT, KENT
 Telephone: Biggin Hill 3247/8 (24 hours)
 Telex: 95466 Airtaxi-Biggin/Fairflight

YORKSHIRE LIGHT AIRCRAFT LTD



ROLLS-ROYCE CONTINENTAL SERVICE CENTRE

PARTS . SERVICE . SALES

NARCO RADIO DEALER
 LEEDS/BRADFORD AIRPORT.
 YEADON, LEEDS. Tel: Rowdon 3133-4

WORLDWIDE AIRCRAFT FERRYING

- EXPERIENCED CREWS
- COMPLETE SERVICE
- LOWEST INSURANCE RATES

Terravia Ltd.

Prince Consort Drive, Ascot, Berkshire.
 Tel: Ascot 21678 (24 hours) Cab: Worldwide, Ascot.
 Operational Base, Blackbushe Airport, Yateley 3121

Let us do your engine top overhaul and take advantage of that **EXTRA ENGINE LIFE**

Call us, we are at your service.

EXPRESS AVIATION SERVICES LTD

Telephone: BN9/2233/4

AIRCRAFT FOR SALE

VINTAGE OR FUSS MOYR. G-AELS. 1900hr since new. 1931. Restored to immaculate condition. 100 g.p.h. cruise at 5 g.p.h. Folding wings. Only six flying in world. Rare opportunity. Phone West End 410. [1587]

AIRCRAFT WANTED

LULSGATE AIR SERVICES LTD. Cessna Dealers. Urgently require second-hand light singles or twins in good condition: all types of transactions considered. Cars, etc., in part-exchange. Tel: Bristol 24401/2/3, or via telex 714. [0004]

DAMAGED LIGHT AIRCRAFT and time-expired aircraft wanted for cash. Telephone Aircraft Recovery, Friday, Somerset 245. [1597]

BALLYE wanted, privately. Approx. £2,000. Box 618/5. [1256]

AIRCRAFT ACCESSORIES & ENGINES

SMALL ENGINE OVERHAUL. Lycoming and Continental. Full life of permit. Farm Aviation Ltd, Rush Green, Hichin, Herts. Tel: Stevenage 88081. [0120]

AIRCRAFT SPARES. Engines and Instruments. Vandalair, Biggin Hill. Tel: 2282. [0220]

AERO ENGINES FOR SALE. CIRRUS MINOR 11 AND 11A ENGINES SPARES AND ACCESSORIES FOR SALE. COMPLETE INVENTORY OR SINGLE ITEMS. ADSTERSEVE PTY LTD, BOX 11 BARKSTOWN, NSW, AUSTRALIA. [1448]

EFFICIENCY AIRCRAFT COMPONENTS announces new replacement blades for 2030 and 15D40 variable-pitch propellers. This blade is approved under FAA Supplemental Type Certificate SPTWE. Efficiency Aircraft Components Propellers Inc. Pacific Propeller Inc. P.O. Box 6176 Seattle, Washington 98188, USA. [1574]

CHRONOMETERS, ex RAF, by WALTHAM. 23-jewelled, 6-position, adjusted. Fully temperature corrected, with glass-fronted carrying case, 12 months guaranteed. £15 each. Davidson's Jewellers, 121 Oldham Street, Manchester. 061-832 5127. [1568]

TWO 18-540-G1B5 Lycoming engines with 114.10 hp. hours, complete with accessories and HC-A3VK-2A/V0411A-4 Hartzell Propeller Assy. Price extremely favourable. Full particulars available from Pibon Aircraft Ltd, CH-6370 STANS/SWITZERLAND. Telex No. 78329. [1549]

AIRCRAFT FOW TUGS. Two available immediately. Combined with Eole petrol engine. 20,000lb d.b.p. Mercury with Perkins diesel. 14,000lb. d.b.p. Apply: Staravia Limited, King's Ride, Ascot, Berks. Tel: Ascot 33423. [0472]

AIRCRAFT FOR CHARTER

EUROPA CHARTERS Arco and other Single and Twin Engines Aircraft available for Charter. Cargo, Aerial Photography, and Self Fly Hire. 24 Hours Service. Telephone: 01-229-0613, 01-229-3408. [0756]

SWIFT AVIATION LTD. Carlsale. Piper Twin Comanche seats 4. Crosby-on-Eden 694/641. [1437]

AFTER your PPL, fly our Cherokee 180C. 4 seats, fully equipped. £11 per hr. Or touring or long weekend. Contact: Millview Aviation, A20 London Rd, West Kingsdown, Kent. Tel: West Kingsdown, 2800. [1436]

FIVE POUNDS PER HOUR. Monthly dry hull charter of Piper Cherokees. Spencer Aviation 01-830 2894. [1488]

EXECUTIVE MK6 DOVE. Airways equipped. Auto-pilot. Dry hull. Charter £20. Coventry 262658. [1336]

AIRCRAFT FOR HIRE

AZTEC. 4 passenger seats, available for charter with or without pilot. David Budworth Limited, Harwich. Tel: 2119/7. [0349]

AIRCRAFT SERVICING

AIRCRAFT SERVICING. C of A. All aircraft to £5,000lb. Air 70 Ltd., Halfpenny Green Airfield, Birmingham, nr. Stourbridge, Worcestershire. Tel: Birmingham 318. [1591]

C OF A SERVICING, REPAIRS. Approved to £5,000lb a.u.w. Enquiries welcomed. West London Aero Services, White Waltham. [0065]

AIRCRAFT FILAMENT LAMPS AND FUSES

AIRCRAFT FILAMENT BULBS & LANDING LAMP BULBS. Thorne panel lighting, navigation lamps, American Strobo.
FLUORESCENT TUBES, ballast units, stabilisers, fittings, neon lamps, fuses, fuse links, cartridge fuses. Continuous stocks for British- and American-made aircraft. ARB released quality controlled.
AVIATION SUPPLIES CO LTD, 282 Bath Road, Hounslow, Middlesex. Tel 01-570 4776 and 01-570 3069. [0017]

AIR CHARTER

SOUTHERN AIR CHARTER. Business air taxis, freight-twin Arcons and larger aircraft 24hr service. Biggin Hill 4480 or 01-930 2023 (day); 01-805 1788 or 01-467 2789 (night); Telex 85486. [0258]

AIR PHOTOGRAPHY

AERIAL CAMERAS. All types at most economic prices. Apply for details to:
Direct Photographic Supplies Ltd., 224 Edgware Road, London, W.2. 01-262 4437/8. [0492]

K14, F24, K15B, K13B and most types of aircraft cameras in stock. Accessories, controls also available. Developing equipment. Morse printers, test units available from stock.
HARRINGAY PHOTOGRAPHIC SUPPLIES LTD. 432 Green Lane, London N5. 01-340 5241-5. [0814]

Maintenance and overhaul for all Piper aircraft and Lycoming engines and their ancillaries. Air frames. Engines. Radio. Electrical components. Propellers. Instruments.

CSE
CSE AIRCRAFT SERVICES LIMITED
OXFORD AIRPORT

CSE AIRCRAFT SERVICES LIMITED OXFORD AIRPORT
KIDLINGTON OXFORD TELEPHONE: 086-75 4321

C. of A. AND REPAIRS—ALL TYPES RADIO INSTALLATIONS AND OVERHAULS

Brooklands Aviation Limited,
Civil Repair Service,
Sywell Aerodrome,
Northampton. Tel: 0604-43113

CONSULTANTS IN AIRCRAFT PURCHASE AND MANAGEMENT

SPENCER AVIATION LIMITED
15 King Street,
St. James's,
London S.W.1.
01-829 2884.

Aircraft Finance

LOMBANK
AIR FINANCE DIVISION
Lombank House, Purley Way,
Croydon CR9 3BL. Tel: 01-684 6911.

Van Dusen
AIRCRAFT SUPPLIES COMPANY

WHOLESALE FOR



in EUROPE, AFRICA, MIDDLE EAST

and

EVERY AIRCRAFT NEED FROM ONE SOURCE

Van Dusen
AIRCRAFT SUPPLIES COMPANY

Oxford Airport, Kidlington, Oxfordshire, England
Telephone: Kidlington 4131
Cables: Dusenair, Oxford, England; Telex: 83406

CUSTOM ACCESSORIES for HELICOPTERS



Model 1250 Hook

- Cargo Boxes
- Cargo Hooks
- Camera Mounts
- Cargo Nets
- Cargo Slings
- Aluminum Snow Shoes
- Hydraulic Dual Ground Handling Wheels

HELICOPTER MECHANICS SERVICE INC.

7826 Sepulveda Blvd. (213)
Van Nuys, California 91405 781-1421

BOARD OF TRADE, CIVIL AVIATION

ELECTRONIC EQUIPMENT R&D

£2945-£4027

SCIENTIST/ENGINEER required in the Directorate of Technical Research and Development, which is charged with advising the Controller of the National Air Traffic Control Services, the Director of General Safety and Operations and their specialist professional staff on problems in their fields where scientific advice and research and development could make worthwhile contributions.

The successful candidate will be concerned with co-ordination and initiation of research on the design and development of ground equipment—radar, communications, ground based navigational aids and air traffic control data processing and displays.

Candidates (men or women) should have 1st or 2nd class honours degree, or equivalent, in an appropriate subject or corporate membership of an appropriate professional institution. Experience of research or development of electronic ground equipment and some knowledge of computers and displays desirable. Operational experience in this field an advantage.

Appointment will be either as Principal Scientific Officer (£2945-£4027) or as Senior Grade Engineer (£3390-£3968). Starting salary may be above minimum. Non-contributory pension. Promotion prospects.

For fuller details and application form, write to Civil Service Commission, Alencon Link, Basingstoke, Hants., quoting S/7524/70. Closing date 21 August 1970.

DC3 pilots—Bahrain

DC3 Pilots are required by Gulf Aviation Company Limited, an associate of BOAC, to be based in Bahrain. The appointments will be for First Officers initially with excellent chances of rapid promotion to Captain DC3.

Excellent tax free salaries and allowances are paid and the conditions of employment include:

- Free furnished accommodation with Air Conditioning
- An excellent Provident Scheme
- Free Medical attention
- Assistance towards the cost of education
- 56 days leave per annum, with free passages to the UK
- Facilities for rebated travel
- Generous free baggage allowance

Minimum Requirements

Applicants must hold British ALTP licences endorsed for DC3 aircraft and have a minimum of 3,000 flying hours.

There is also a vacancy for a less experienced pilot as a First Officer on DC3s and the minimum requirement in this case is UK CPL/IR with Performance 'A', DC3 endorsement, and a minimum of 1,500 flying hours.

Applications should be addressed to:

Personnel Officer
BOAC Associated Companies Limited
PO Box 10
Hounslow
Middlesex

ANTI-COLLISION BEACONS

WHELEN STROKE and Rotating Models (stair changeable) always in stock. New or exchange. Air Stores, Maitland Road, London E15. (1038)

AVIATION COMPUTERS

KAYS OF EALING LTD. stockists of Ariston Japponex, Swissair, RAK MK 4 Computers, Kneeborn, scale rules, projectors, map cases, books, etc. Quotation mail orders by return. Write for latest illustrated catalogue. Dept. P 8-19, Bond Street, Ealing, London W5. 61-567 3813. (1023)

FOR SALE

FOR SALE: New Aerial Photogram Camera. Zeiss 15/2325 Pco, 15cm, also 23x23cm, 2 magazines. Guaranteed. Box 1417/3. (1398)

FERRYING

AIRCRAFT DELIVERIES. Twenty years world-wide experience ferrying all types piston and turbine. Peter Nock, West London Air Charter Ltd., Ferry House, Copthorne, Sussex. Phone Copthorne 3313. (1022)

GROUP FLYING

CHEROKEE 190C. Join our group and fly the beautiful VHP/VOR/ADF equipped aircraft at £3.10 per hour. Share price £255. Apply Mr Langer 01-386 2932, or Marlow (06284) 4615 Bucks. (1544)

SHARE in Cherokee 190 Flying Group. £225. Also 2 unused Chimp Folding Mini Bikes. £65 each. Ring Hamel Hempsstead 56131. (1488)

HELICOPTERS FOR CHARTER

BELL JETRANGER available for charter. Four passengers at 140 m.p.h. Spencer Aviation, 15 King Street, St. James's S.W.1. Tel: 01-839 2884. (1497)

HELICOPTERS FOR SALE

£27,950: Miller 120, 3 seats. Ex. condition. VHP/VOR/Intercom., long-range tank, dual controls. Good blade/engine life. C of A September '70. Tel: Haslemere 2373 (0486). (1043)

BRANTLY 305 de Luxe. 4/5 seats. VHP/VOR/ADF. C of A April 1971. TT 575hr. engine 25hr since major overhaul. 100 m.p.h. cruise. 24hr endurance dual controls. £11,300. Telephone: Guildford 61808. (1037)

INSURANCE

BUDGET FLYING? Insurance on credit up to 12 months without charge. Traffords, 151 Hatfield Road, St. Albans, Herts. (1082)

RADIO AND RADAR

MARCONI Type AD712 ADF Systems. Two a/c available immediately. ARE released. Staravia Limited, King's Ride, Ascot, Berks. (1019)

SITUATIONS VACANT

FIRST OFFICER required for Company Beagle 208S. Minimum requirement CPL/IR. Age range 21-30 years. Usual details in first instance to Capt D. Austin, British Ropes Ltd, Group Aircraft Services, Gamston Aerodrome, Gamston, nr. Bedford, Notts. (1481)

DAN-AIR ENGINEERING LTD.
LASHAM AIRFIELD
NR ALTON
HANTS.

require
AIRFRAME & ENGINE FITTERS
for maintenance work, preferably experienced on large transport aircraft.
Apply to the
PERSONNEL OFFICER (1078)

SITUATIONS VACANT

INSTRUCTOR, with or without CPL. Full-time vacancy. Apply Skywork Ltd, Building 32, Stansted Airport, Bishop's Cleeve 502346. [1562]

Following personnel required for three-year contract based Antigua:—

1. DCS/DC4 Captains salary US\$662 to \$1,900 monthly, plus bonus.
2. DCS/DC4 "A" and "C" Licensed Engineers, salary from US\$636 monthly. Send resume, or contact.

SEAGREEN AIR TRANSPORT,
33 QUEENS HOUSE,
LEICESTER PLACE,
LONDON WC2.
Tel: 01-437 5095. [1563]

MECHANICS for Bell-47, ICAO Licence "A" and "C" required. 18 months' contract, 6 months paid leave per annum. No family accommodation. Write to manager, Pan African Airlines, PO Box 1054, Ikeja, Nigeria. [1557]

ENGINEER, with "A" and "C" Licence required to maintain small fleet of Piper PA23 Pawnee aircraft, based in Lincolnshire and working in the UK. Please contact Miller Aerial Spraying Company, Tower House, Sandy Lane, Woodhall Spa, Lincs. Telephone Woodhall Spa 2253. [1575]

PPL HOLDER needed for six-week tour flying around Europe. Expenses. In Cherokee D. Hand, 73 High Road, Hockley, Essex. Tel: 3949. [1577]

SECRETARY/SHORTHAND TYPIST. Flying Club seeks air minded girl with initiative and administrative qualities. Lively and varied position in this exciting environment. Aerodrome contacts and visits as part of duties. Good hours, salary £1,050 p.a. plus I.V.s. Free Personnel Ltd, 15-17A George Street, Brighton. Tel: 01-484-4422 (15 lines). [1553]

FLYING INSTRUCTOR required for expanding North London School. Write Box 1564/5. [1514]

IMMEDIATE VACANCY for DH Heron Pilots. Full-time, part-time. Western Europe. Apply to Box 1641/5. [1501]

INTERNATIONAL AGRICULTURAL AVIATION CENTRE

TECHNICAL OFFICER

Duties include responsibility for technical and advisory services provided on aircraft, application systems and techniques, editorial work, organisation of symposia and working parties and liaison visits to member countries.

Qualifications: Ideally, qualified in an aeronautical or agricultural discipline, age range 25-35. Experience of agricultural aviation and/or light aircraft operation would be advantageous as would flying experience and a knowledge of languages.

The successful candidate will be responsible to the Director General for the smooth running of the organisation and will possess the personal qualities necessary to carry out a challenging variety of duties, with a particular ability to represent the organisation at all levels.

Salary: Negotiable but well in line with European scales.

Applications should be addressed to the Director General, IAAAC, c/o v.d. Boschstraat 4, The Hague, Netherlands. [1564]

HELICOPTER PILOTS

Required by the
GOVERNMENT OF UGANDA.
POLICE AIR WING

Candidates must have a valid UK (or Commonwealth) Helicopter Commercial Pilot's Licence and will be required for flying Westland Scout and Bell Jet Ranger 106A Helicopters. They should preferably also have fixed-wing experience for flying light single- and twin-engine aircraft. Possession of a Helicopter Instructor's Rating will enable successful candidates to be considered for entry at maximum salary. Experienced Helicopter/fixed-wing pilots possessing Private Pilot's Licences will be considered.

Successful candidates will be appointed in the rank of Deputy Superintendent of Police (Pilot) and are required on contract for one tour of 21-27 months in the first instance.

Commencing salary according to qualifications and experience in the basic scale Uganda Shillings 28,800 to 33,420 (£ Stg. 1,600-1,945) a year. In addition, an allowance, normally tax-free, ranging from £ Stg. 208 to 354 a year will be paid by the British Government direct to an officer's bank account in Uganda. Gratuity 25% of total salary drawn. Free passage. Liberal leave on full salary. Generous education allowances. Housing provided at low rental.

The work of the Police Air Wing consists of flying on reconnaissance, survey, communications, air ambulance, air supply and general air support of Police Units and other Government Departments.

Apply to CROWN AGENTS, "M" Division, 4 Millbank, London SW1, for application form and further particulars, stating name, age, brief details of qualifications and experience, and quoting reference number MJT/681262/PE.

[1502]



HAWKER SIDDELEY

AVIATION LIMITED, WOODFORD

have immediate vacancies in the

PRODUCT SUPPORT DEPARTMENT for

AN INSTRUCTOR/LECTURER

in Aircraft Electrical Systems, for the Customer Training Centre.

Applicants for the position should have extensive experience in Aircraft Servicing, preferably in a Supervisory capacity. Experience should include knowledge of logic circuitry using solid state components.

Applications should be made to:

**The Employment Officer,
HAWKER SIDDELEY AVIATION LIMITED,
Woodford, Nr. Stockport, Cheshire.**

Data Analyst Supervisor (female)

BOAC require a Data Analyst Supervisor (female) for their Flight Data Acquisition Group at London Airport. Apart from supervisory experience applicants should have sound knowledge of analytical methods and mathematical processes. Experience of aircraft flight operations or performance analysis would be especially valuable and familiarity with ground data handling equipment an added advantage.

Salary is in the range £1698 to £2075 per annum, including London Weighting. There is an excellent contributory pension scheme, sports and social club and opportunities for holiday air travel.

Holiday arrangements for 1970 will be honoured.

Please apply to:

Manager Selection Services, (F1/334), BOAC P.O. Box 10, Hounslow, Middlesex.



BOAC

AIR TRAFFIC CONTROLLER

A vacancy exists for an Air Traffic Controller with a large well-established and expanding project in the Middle East under the management of an internationally-known British Company.

Applications are invited from experienced men with P.A.R. qualifications, aged 35-48, who are prepared to serve for a minimum period of one year; termination thereafter would be at three months' notice. Instructing experience would be particularly relevant. This appointment carries a realistic salary plus an annual bonus, both of which can qualify for generous tax concessions. Free bachelor accommodation and a good standard of catering are provided by the Company. Leave, on overseas salary and normally taken at seven-monthly intervals, is on the basis of 4 days per month, and the Company provides free air passages to U.K.

Please apply, quoting Reference 204, to:

**THE PERSONNEL MANAGER
AIRWORK SERVICES LIMITED
BURLINGTON ARCADE
BOURNEMOUTH, HAMPSHIRE**



BRISTOW HELICOPTERS

require

JET RANGER LICENSED ENGINEER

For Nigeria

Salary and overseas allowance of £2965 P.A. plus generous local living allowance.

Working cycle 4 months in Nigeria and 1 month's leave in U.K., until married accommodation available.

Production Controller

The Aircraft Division of Field Aircraft Services Limited, which is concerned with the overhaul, repair, fitting-out and modification of medium and heavy contemporary aircraft, needs a Production Controller to meet the needs of current reorganisation and growth at its Castle Donington (East Midlands Airport) base.

He will, in this senior post, be initially accountable to the Works Manager for the direction and co-ordination of production planning, purchasing, stores, stock control and production estimating.

Experience in these functions is more important than formal qualifications though relevant training, preferably but not essentially in aircraft industry, would be a distinct advantage. Age 30-50.

This appointment is likely to attract candidates who are currently earning around £1700 and looking for advancement allied to future career opportunities.

Write in complete confidence to the Company's Personnel Consultant:

James Horne,
c/o FIELD AIRCRAFT SERVICES LTD.,
Heathrow Airport-London, Hounslow, Middx.

**FIELD AIRCRAFT
SERVICES LTD**

SITUATIONS VACANT

FLIGHT SAFETY OFFICER/COMPANY TRAINING OFFICER

Channel Airways have a vacancy for a Flight Safety Officer. Applicants must have had previous experience either as a pilot, navigator or flight engineer, but need not hold current licences. Successful applicant would also be required to undertake a specialised course to qualify as Company Training Officer. I deal with the requirements of the Civil Aviation Industry Training Board. Salary will be negotiable according to experience of applicant. Apply Personnel Officer, Channel Airways, Airways House, Stansted Airport, Essex. (158)

German company has a vacancy for TWO PILOTS

to operate its Bremen-based multi-engine business aircraft.

Minimum requirements:

CPL/IR, 2,000hr

thereof 1,000hr multi-engine in command.

Permanent position with a high rate of flying hours P.A.

Please apply immediately to

S. L. HOFFMANN,
UNITED ECONOMIC ADVISERS LTD.
45A KENSINGTON HIGH STREET,
LONDON W8. (159)

FAIRFLIGHT

have vacancies for:

- * DOVE CAPTAIN
- * DC-3 CO-PILOT
- * CHIEF ENGINEER

A and C licences on Dove and DC-3 an advantage

There are also vacancies for experienced engine/airframe engineers

Enquiries to:

**The Personnel Manager,
FAIRFLIGHT,
Biggin Hill Airport,
Kent**

SATCO ASSISTANT

required with Aerodrome Approach and Radar Ratings. Met. Obs. Certificate an advantage. Please write giving full particulars including salary required and when available, to:—

**SOUTHAMPTON AIRPORT LTD.,
Southampton Airport, Southampton**

SITUATIONS VACANT

AIRCRAFT ENGAGEMENTS CO.
ALDERLY EDGE,
CHESHIRE,
UK.
Tel: 4243

Require the following flight deck crews for lucrative short-term employment overseas:
Captains for HS 748 Viscount 800 and Boeing 707.
Minimum rating ATPL, I/R.
Flight Engineers, Licensed Boeing 707 3/400.
Personnel already on our register will be notified with full details. [1362]

THE REPUBLIC OF SINGAPORE NEEDS FLYING INSTRUCTORS

Applications are invited from suitably qualified persons for appointment as Qualified Flying Instructors in the Air Force of the Singapore Armed Forces.

QUALIFICATIONS AND EXPERIENCE

Applicants should be graduates of the RAF Central Flying School or equivalent institution and should be suitably qualified to instruct on both single piston and jet aircraft, preferably the Jet Provost and Hunter. Applicants must have been actively engaged in instructional duties within the last two years.

REQUIREMENTS

Central Flying School Graduates: B1/A3/A1.
Experience as Flying Instructor: 500hr.
Flying Experience: 3 years or 1,000hr.
TERMS OF SERVICE
Length of Contract: Two to Five Years.
Salary: S\$2,500 p.m., up to S\$2,950 p.m.
Flying allowance: S\$200 p.m.
Housing Allowance: S\$500 p.m.
Gratuity: Terminal gratuity is payable at rate of 5% of last drawn salary for each month of completed service.

Trial Period: There will be a trial period of three months on initial appointment.

Free Passage: Free passage to Singapore will be granted to the officer on appointment and also return passage on completion of service. On successful completion of the trial period free passage to and from Singapore will be granted to his wife and three children below the age of 18 years.

Free Medical Attention: Free Medical Attention by Government Medical Officers is provided for the officer and his family.

Vacation Leave: 45 days per year.
For application forms and further details please write to:

THE DIRECTOR OF MANPOWER,
MINISTRY OF THE INTERIOR AND DEFENCE,
SINGAPORE 1.

[1978]

SECRETARY for *Flight International*

We are looking for a bright intelligent girl aged over 21 to WORK for our Advertisement Manager. The ideal candidate will have good shorthand (100 w.p.m.) and typing (50 w.p.m.) speeds and the ability and enthusiasm to WORK on her own initiative in a very busy office.

Our working conditions are excellent with a 35 hour week; subsidised staff restaurant; sports and social club; three weeks' annual holiday; pension scheme; staff purchase concession facilities.

We are situated near Waterloo and Blackfriars stations and there is an excellent train and bus service from South East London.

If you are interested, simply drop a line to Mr. G. A. Smith, Personnel Officer, *Flight International Magazine*, Dorset House, Stamford Street, S.E.1. or Telephone WATERloo 3333 ext 636 to arrange an appointment.

Licensed Aircraft Engineers

Vacancies exist for:-

PERSIAN GULF AREA Chief Engineer A and C

Licensed for small flying school operating Cherokee & Beech Musketeer aircraft. Salary £2,500 tax free. Full accommodation and subsistence provided free of charge. Immediate requirement one year contract renewable.

WEST INDIES AREA A and C Licensed Engineer

As Assistant Chief Engineer for Maintenance organisation handling modern light aircraft up to Beech King. Three year contract, renewable, with three months leave on termination plus two weeks local leave p.a. in 1st and 2nd year. Salary £3,000-£3,500. Immediate requirement.

TANZANIA

A and C Licensed Engineer up to groups 5.3.2. and 6.2.2.

Salary East African £200 per month. Equivalent to £2,630 Sterling per annum. 3 Year contract. Free hard furnished accommodation. Leave 3 months after 3 years service plus 2 weeks local leave p.a. in 1st and 2nd year. Immediate requirement.

Applications to:

Personnel Department,
Eagle Aircraft Services Ltd.,
Leavesden Aerodrome,
Nr. Watford, Herts.

OVERSEAS B-N ISLANDER OPERATIONS

A major U.K. and International Fixed-wing and Helicopter operator providing contract Air Services to the oil industry throughout the World invites applications from pilots interested in flying Islander aircraft in West Africa.

Contracts will be for one year initially and are expected to be renewable.

Initially Pilots will be employed on a Bachelor basis and return to the U.K. for one month's leave after each four months on location. Married accommodation is expected to be available at an early date.

A generous salary and scale of allowances is paid and accommodation is provided.

There are immediate vacancies for two pilots and shorter contracts may be considered.

Minimum desired qualifications are:

A.T.P.L. with Current I/R; 5,000 hours including 2,000 hours in Command although in certain cases experienced pilots holding only C.P.L. and I/R will be considered.

Write to:

Operations Director,
Bristow Helicopters Ltd.,
Redhill Aerodrome, Surrey.
Or telephone: Nutfield Ridge 2353

GAT

GEMINI AIR TRANSPORT LTD.

800 New Street, London, E.C.2

*We have vacancies for the following:-***Permanent Engagements****BAC 1-11:** Captains and First Officers for employment in Europe and the Far East.**Boeing 707-320C and 138B:** Captains, First Officers, Flight Engineers and Navigators for employment in Europe.**Short-term Winter Engagements**

(6 months initially, commencing October 1970)

Viscount } Captains and First Officers for employment outside Europe (Conversion onto HS.748 will be considered)
HS.748*Applications, with full details please, to:***Managing Director, Gemini Air Transport Limited, Concord House, High Street, Feltham, Middlesex.****Also Ground Engineers Categories A, C, X and Radio, licensed on the above types of aircraft.***Applications, with full details please, to:***Chief Engineer, Gemini Air Transport Limited, Concord House, High Street, Feltham, Middlesex.**

Airline Instrument Fitters

BOAC has vacancies for skilled Instrument Fitters at Heathrow Airport, London, to work on the maintenance and servicing of VC10 and Boeing 707 gyroscopic instruments and electronic auto-pilot systems. An approved apprenticeship or service training and at least three years' experience of aircraft instruments are required.

Pay is £27. 4. 6. per week rising after approximately 3 months' satisfactory service to £28. 16. 0. plus shift premium.

Holiday arrangements will be honoured. There is an excellent contributory pension scheme, sports and social club and opportunities for holiday air travel.

Manager Selection Services (F1/333), BOAC, PO Box 10, Hounslow, Middlesex

**BOAC****DUTY OFFICERS**

required by U.K. Ground Handling Organization
at **STANSTED AIRPORT—LONDON**

Apply to Traffic Manager,
SERVISAIR LTD.
76, DEANS GATE
MANCHESTER, M3 2EJ.

*These classified pages of*

FLIGHT INTERNATIONAL

*are studied by over
200,000* readers in over
100 countries throughout
the world.*

If you have a new or used aircraft for sale, a service to offer or a personnel requirement phone

01-928 3333

for immediate attention.

**WHY NOT LET US
HELP YOU IN
OUR NEXT ISSUE?**

**Dorset House
Stamford Street
London S.E.1**

Telex 25137

*1969 ABC circulation 39,880 with
6-8 Readers per copy

SITUATIONS VACANT

OXFORD AIR TRAINING SCHOOL THE LARGEST FLYING TRAINING SCHOOL IN EUROPE

As a result of further expansion invite applications from

QUALIFIED FLYING INSTRUCTORS

CPL/IR and very high standard of instructional background essential. Commencing salary: £2,760. An excellent opportunity to work in an expanding go-ahead Aviation School.

ALSO

QUALIFIED GROUND INSTRUCTORS

Applicants should possess Flight Navigator Licences, ATPL, or Service equivalents and have civil or Service experience as an instructor.

Successful candidates will be required to teach such subjects as Navigation, Flight Planning, Aircraft Performance, etc. to ab initio and ex-Services students preparing for professional Pilots and Navigators Licences. Commencing salary £1,760 p.a. plus annual increments and Pension Scheme.

Details to:

OXFORD AIR TRAINING SCHOOL,

OXFORD AIRPORT,

KIDLINGTON,

OXFORD.

Tel: 086-76 4321.

[1581]

FLIGHT TRAINING INSTRUCTOR required for immediate employment. Contact Falroaks School of Flying, Chobham 7310. [1503]

AIR GREGORY LIMITED

REQUIRE FIRST-CLASS TRADESMEN

Engineers for maintenance of light twin- and single-engine aircraft. Aircraft Electrician. Experience in fault finding and installation.

Reply to:-

F. M. DUNN,

ENGINEERING DIRECTOR,

DENHAM AIRFIELD,

BUCKS.

Telephone Denham 2495.

[1030]

A PILOT with CPL and Instrument Rating and a minimum of 2,500hr required to take charge of and develop an established light executive charter company. Salary by negotiation. Interest in the company will be offered after a satisfactory probation period. Apply in writing to Mr P. Pinchin, Flying Enterprises Ltd, Luton Airport, Bedfordshire. [1580]

SITUATIONS WANTED

ATH. 25, single, extensive bush experience, twins and bosks; Interested in African tour of 6-18 months. Box 1283/5. [0958]

ALTP. 3,000hr. Comet, Viscount, HS 740, wants overseas airline position. Box 1588/5. [1524]

LICENSED ENGINEER, wide experience light aircraft, seeks overseas employment. Box 1632/5. [1504]

HELICOPTER PILOT, Age 29, QH1 3,000hr, worldwide experience piston and turbine, used to running on flight, seeks position in young firm where an opportunity exists to train in management as well as flying duties. Leaving HM Forces June 1971. Box 619/5. [1508]

CAPTAIN, 47, seeks employment. 17,000hr, ready on DC3, 4, 6, 7, Caravelle (1,100hr). Experience Europe, North Atlantic, Africa; Belgian Senior Commercial Licence. Speaks French, English, Spanish, Flemish, & Glas. Explanade, 1970. WREEMHURST, BELGIUM. [1365]

CAPTAIN, experienced Worldwide; Britannia, H 707, 3,000hr. Box 1433/5. [1584]

SPONSORS REQUIRED

YOUNG MAN (24), requires CPL Sponsorship. I have a PPL, nearly 100hr and unlimited enthusiasm. Also have some cash, so partial sponsorship would be sufficient. Any terms accepted. Box 1435/5. [1585]



Require

GROUND ENGINEERS

The establishment of our main engineering base at London (Stansted) Airport where our fleet of Trident, Comet, One Eleven and Viscount airliners will be maintained give us vacancies for the following licensed engineers:

A Trident, Comet, One-Eleven, C Spey, Avon. X Instruments, Electrical, Flight Systems, Composites.

Attractive salaries and permanent employment offered with 25 year established airline whose expansion creates opportunities for quick promotion to proven engineers.

Write in full to:

Technical Director, Channel Airways, Airways House, London (Stansted) Airport, Stansted, Essex.

TUITION

STAPLEFORD FLYING CLUB. Modern aircraft. Excellent clubhouse facilities. IMC and RT Ratings. Phone Stapleford 380 for full details or trial lesson. [0943]

AIR Navigation and Trading Flying Club, Blackpool, PPL, IMC, Night Ratings, aerobatics. Mixed fleet of seven aircraft available. Sales and Servicing. Telephone: 0253 45300. [1270]

AIR CERTIFICATES. Expert Postal Courses for the Basic Aeronautical Engineering - Examinations on "Satisfaction of Refund of Fees" terms. Officially approved and recognised. For details of Exams and 600 Courses in Aeronautical, Mechanical Eng, Electronics, Radio, etc. write for 124-page Handbook - FREE. British Institute of Engineering Technology (Dept. 161K), Aldermaston Court, Aldermaston, Berks. [0977]

WEST LONDON AERO CLUB

Approved 35hr PPL Instructor's and Advanced Training course: 13 aircraft, four instructors; D4 Link, RT training examination. Residential accommodation available. Restaurant bar. Social members welcome. London 20 miles (M4).

WHITE WALTHAM AIRFIELD

Tel: Littlewick Green 3372 3/4.

[0854]

LEARN TO FLY. Trial flight £3. Condors, Aircoques, Cessna 150's from £5 14/- per hour. West Essex Flying Club, Elgin Hill 4132 or 01-982 4217. [0970]

AVIGATION, 30 Central Chambers, Ealing Broadway, London W5 (Tel: 01-567 8940). Full-time or postal tuition for the written examinations for Board of Trade pilot/navigator licences. Courses arranged to suit individual requirements. Board of Trade recognition for the Instrument Rating. Service pilots and navigators may obtain our courses through the Forces Correspondence Course Scheme. Details on application. [0248]

FULLY AUTOMATIC FLIGHT SIMULATOR. Instrument ratings, IMC ratings, RMI/ADF, VOR, ILS. General instrument flying. £3 10/- per hour. BoT approved R/T licences. Expert Tuition. Goodwood Flight Simulation, Goodwood, Chichester 82541. [1484]

SIR JOHN CASS COLLEGE SCHOOL OF NAVIGATION. New address: 100 The Minerva, Tower Hill, London EC3. Tel: 01-480 5043 ext. 83. Courses of lectures for ALTP and CPL, also individual tuition for all BoT licences if preferred. Fees: CLP £8 10s, ALTP £16 5s, P/Nav. £20 10s. [10294]

TUITION

LONDON SCHOOL OF FLYING

35hr approved PPL course. Instructors' Twin Ratings and Advanced Training Courses: 18 Cherokees, 3 D4 links, RT Examinations. Pipers for self-ty hire and sale. Piper air taxi service and Piper aircraft maintenance. Restaurant, Curdon Eleo cooking.

SOLO RATE ON CHEROKEE 140s.

£8 PER HOUR INCLUDING WEEKENDS.

BIMMER AVIATION LTD,

PIPER MAIN DEALERS,

THE AERODROME, ELSTREE, HERTS.

01-951 4411.

[1431]

LEARN TO FLY at South London Aero Club: 3 and 4 seaters available for touring. £2 buys, without obligation, your first lesson at the controls of today's world's most popular aircraft. Phone Biggin Hill 2827. [1268]

FLY FROM STANSTED

REDUCTION FOR PAYMENT IN ADVANCE

- Night Ratings.
 - 35hr Approved PPL Course.
 - IMC Ratings.
 - Twin Ratings.
 - Type Ratings.
 - Instrument Ratings and Renewals.
 - R/T Ratings.
 - Piper and Cessna Aircraft.
- Phone: Bishop's Stortford 503349 (day). Bishop's Stortford 4336 (night), or write Skywork Ltd, Bldg 53, Stansted Airport, Essex. [0627]

WANTED

SCRAP AIRCRAFT, fire tenders, machinery and all types of scrap. Contact Tompa Metals Ltd, 17 Warington New Road, St. Helens. Tel: 36178. [1571]

SERVICABLE HOSES for Lincoln Refueller, 2in internal diameter, 75ft in length, fitted with male and female couplings. Southampton Airport Ltd, Southampton 309 179Q. [1572]

BOOKS

AERAD FLIGHT DOCUMENTATION—World-wide coverage with weekly amendment service.

IATA Publications (Register of Containers and Pallets; Restricted Articles Regulations); IAL Air Mileage Handbook; "Air Freight—Key to Greater Profit" by Greenewald & Heintzner.

APPLY INTERNATIONAL AERADIO LTD Aerad Flight Documentation and Printing Division, Aeradio House, Hayes Road, Southall, Middlesex, England. [0494]

ROGERS AVIATION LIMITED FLIGHT SCHOOL

U.K. FLIGHT TRAINING COURSES

Private Licence I.M.C. Rating

Night Rating Multi Rating

Instructor Rating R/T Rating

1179 Ratings

FULL TIME PROFESSIONAL FLIGHT/GROUND INSTRUCTORS + LATEST EQUIPPED SIMULATOR

F.A.A. FLIGHT TRAINING COURSES

Private Licence Commercial Licence

Instrument Rating Multi Rating

Airline Transport Flight Engineer

Flight Navigator Aircraft Dispatcher

ROGERS AVIATION LIMITED

CRANFIELD AIRFIELD - BEDFORD - ENGLAND

Telephone: Cranfield 641 Telex: 82320

SURREY & KENT FLYING CLUB BIGGIN HILL AIRFIELD

35 hour Approved Course for PPL Night Ratings; IMC Ratings; Modern Aircraft for all Training; Airways Equipped Twins and Singles; Specialised Courses for Instrument Rating for Commercial and Private Pilot; D4 Link Training with Qualified Link Trainer Instructor.

Apply for brochure stating your requirements.

Telephone: BN9 2255

LEARN TO FLY WITH THE FLYING SCHOOL APPROVED BY THE BOARD OF TRADE

- Private Pilot's Licence - Fixed Wing
- Private Pilot's Licence - Helicopter
- Twin Engine Rating R/T Licence
- I.M.C. Rating Night Rating

'Reduced Prices for Trial Lesson: Fixed Wing £3, Helicopter £8

PHONE DENHAM 2417

GREGORY FLYING TRAINING SCHOOL

DENHAM AERODROME

DENHAM + UXBRIDGE - MIDDXX.

A MEMBER OF THE BRISTOL STREET GROUP

CLASSIFIED ADVERTISEMENTS

Use this Form for your Sales and Wants

To "FLIGHT International" Classified Advertisement Dept., Dorset House, Stamford St., London, S.E.1

Telephone: 01-928 3333. Telegrams/Telex: Flight Iliffe, 25137 London.

PLEASE INSERT THE ADVERTISEMENT INDICATED ON FORM BELOW

- **RATE:** 2/3 PER WORD, MINIMUM 27/-
- **NAME AND ADDRESS TO BE INCLUDED IN CHARGE IF USED IN ADVERTISEMENT.**
- **BOX No.** if required, add 2 words plus 1/-
- **Cheques, etc., payable to "FLIGHT International" and crossed "& Co."**
- **PRESS DAY: FIRST POST THURSDAY** for following week's issue.

NAME

ADDRESS.....

Please write in BLOCK LETTERS with ball pen or pencil.

NUMBER OF INSERTIONS REQUIRED.....

REMITTANCE VALUE.....ENCLOSED

INDEX TO ADVERTISERS

	PAGE		PAGE		PAGE
Air Gregory Ltd.	17 & 25	Express Aviation Services Ltd.	18	Piper Aircraft Corporation	Cover 19
Air Touring Services Ltd.	18	Fairflight	22	Robinson Ltd., L.	6
Airwork Services Ltd.	23	Fairflight (Charters) Ltd.	18	Rogers Aviation Ltd.	14 & 23
Alvia Ltd.	13	Ferranti Ltd.	5	"Science Journal"	Cover 111
Bell Helicopter	10	Field Aircraft Services Ltd.	2 & 22	Shackleton Aviation Ltd.	24
Bristow Helicopters Ltd.	21 & 24	Flying Enterprises Inc.	18	Shackleton Airport Ltd.	15
B.O.A.C.	21 & 24	P.P.T. Industries Ltd.	13	Southampton Airport Ltd.	22
B.O.A.C. Assoc. Co's.	20	Gemini Air Transport Ltd.	24	Spencer Aviation Ltd.	18
British Rail (London Midland)	13	Glenn Air Ltd.	18	Sportair Aviation Ltd.	18
Brooklands Aviation Ltd.	19	Hawker Siddeley Aviation Ltd.	21	Sud Aviation	Facing Edit. Page 166
Brynmor Aviation Ltd.	18	Helicopter Mechanics Service Inc.	10	Surrey & Kent Flying Club	28
Charlotte Aircraft Corporation	18	Helicopter Sales (UK) Ltd.	6	Templewood Aviation	14
Civil Service Commission	20	Helms Ltd.	2	Terraviva Ltd.	18
Clarkair International Ltd.	14	Hughes Aircraft Co.	7	Traders Instruments Ltd.	6
Crosby Aviation Ltd.	18	Lombank Ltd.	19	V/O Aviasport	8
C.B.E. Aviation Ltd.	1 & 19	Lufthansa Air Services Ltd.	17	Van Dusen Aircraft Supplies	19
Dinos Navigator Co. Ltd.	Cover 11	Messerschmidt-Bölkow-Blohm	9	Westland Helicopters Ltd.	Facing Edit. Page 177
Diamond Aviation Ltd.	16	Nord Aviation	Facing Edit. Page 176	Yorkshire Light Aircraft Ltd.	18
Eagle Aircraft Services Ltd.	17 & 25				

IPC TRANSPORT PRESS LTD., Dorset House, Stamford Street, London SE1; telephone 01-928 3333. Telegrams/Telex: Bispres Ldn, 25137 Annual subscriptions: Home £8. Overseas £8 for one year; £20 for three years. Canada \$20 surface and USA \$24.50 airspeeded for one year. Second Class Airmail—U.S.A. & Canada \$44.50 for one year.

Change of address—please note that four weeks' notice is required, together with the return of a wrapper bearing the old address. Registered at the General Post Office as a newspaper. Second Class Mail privileges authorised at New York, NY.
Branch Offices: Coventry, 8-10 Corporation Street; telephone 0203 25210. Birmingham: 401 Lynton House, Walsall Road, Birmingham 22b; telephone 021 356 4838. Manchester, Stadium House, Talbot Road, Salford, Manchester M32 0EP; telephone 061-872 4211. Glasgow, 2-3 Clairmont Gardens, Glasgow C3; telephone 041 332-3792 or 041 332-8806. Bristol, 11 Elmdale Road, Bristol 8; telephone 0272 21491/2/3.



International Business Press Associates OVERSEAS ADVERTISEMENT SALES OFFICES. FRANCE: Division Internationale, Compagnie Française d'Éditions, S.A., 40 Rue du Colisée Paris 8e. GERMANY: Kontinentale Anzeigen-Verwaltung, Grafenberger Allee 269, 4 Düsseldorf, W. Germany. HUNGARY: Hunexpo, Budapest XIV, Városliget. ITALY: Biss-Kompass SpA, Via Montagna 6, Milan, Italy. JAPAN: International Business Press, Asia Magazines Ltd., Seika Building, 7-16 4-chome, Akasaka, Minato-ku, Tokyo. SWITZERLAND: Agentur IZ, 8001 Schaffhausen, Neustadt 57. NEW YORK: Iliffe-NTP Incorporated, 208 East 42nd Street, New York, N.Y. 10017. CHICAGO: Iliffe-NTP Incorporated, 8 South Wabash Avenue, Chicago, Illinois 60603. LOS ANGELES: Duncan Scott & Marshall Inc., 3830, W. 8th Street, Los Angeles, California 90047. SAN FRANCISCO: Duncan Scott & Marshall Inc., 55, Post Street, San Francisco, California 94104.

Printed in Great Britain for the Publishers, IPC TRANSPORT PRESS LTD, Dorset House, Stamford Street, London, SE1, by INDEX PRINTERS, Dunstable, Beds. Distributed by IPC Business Press (Sales & Distribution) Ltd., 40 Newling Green Lane, London, EC1 (01-497 3636). "Flight International" can be obtained abroad from the following: AUSTRALIA AND NEW ZEALAND: Gordon & Gotch Ltd. INDIA: A. H. Wheeler & Co. CANADA: The Wm. Dawson Subscription Service Ltd., Gordon & Gotch Ltd. SOUTH AFRICA: Central News Agency Ltd. Wm. Dawson & Sons (SA) Ltd. USA: Eastern News Distributors Inc., 155 West 15th Street, New York 10011, USA. CONDITIONS OF SALE AND SUPPLY: This periodical is sold subject to the following conditions, namely, that it shall not, without the written consent of the publishers first given, be lent, re-sold, hired out or otherwise disposed of by way of Trade at a price in excess of the recommended maximum price shown on the cover, and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertisement, literary or pictorial matter whatsoever.



**THE MOST
CHALLENGING
SCIENTIFIC FACT THAT
TECHNICAL MANAGEMENT
HAS TO FACE**

... is the simple, basic, inescapable truth that there are only 24 hours in a day. Barely enough time to keep abreast of technological developments in your own sphere, let alone come to terms with what's happening in other disciplines.

How can you maintain a working awareness of progress in practical science at large, without devoting all your waking hours to it?

It isn't hard. Just read *Science Journal* regularly.

With over half its readership in industrial administration, *Science Journal* puts special emphasis on keeping management fully briefed on major developments in every relevant sphere.

You'll see timely, well-written articles on every front where modern technology is changing man's life. And—of more immediate importance—you'll find in every issue the 'Science and Management' series, packed with provocative ideas for running your business creatively.

Science Journal keeps the technical side of your business life up-to-date and well informed.

That, too, is a scientific fact.

SCIENCE JOURNAL

THE INTERNATIONAL MONTHLY FOR TECHNICAL MANAGEMENT 6/-
Place an order with your newsagent.



The brand new Piper Pressurized Navajo gives you extra power, extra performance, extra payload and extra size—more extra features than you'll find in any other airplane in its class. Take a look at the numbers: **29,000-foot operational altitude with 10,000-foot cabin altitude ■ 5.5 psi pressurization system ■ 266 mph cruise at 24,000 feet ■ 2958-pound useful load ■ 6/8-place capacity ■ Over 1400-mile range ■ 2830-foot accelerate/stop distance ■ Twin turbocharged Lycoming 425 hp engines ■ Full 75% cruise power to 24,000 feet; 65% to 29,000.**

The Piper Pressurized Navajo is packed with features that pilots and passengers appreciate, from its exceptional performance characteristics to its comfortable cabin environment. For the facts see your local Piper dealer or write for complete information on the Pressurized Navajo to Piper Aircraft Corporation, Lock Haven, Pa. 17745. Dept. PN-2.

Distributed in the United Kingdom and Ireland by

CSE

AVIATION LIMITED
OXFORD AIRPORT, KIDLINGTON, OXFORD
Telephone: 00965 4321

PIPER

