

JANE'S  
ALL THE WORLD'S  
AIRCRAFT  
1974-75

Sixty-fifth year of issue

Edited by  
John W.R. Taylor



# JANE'S ALL THE WORLD'S AIRCRAFT

FOUNDED IN 1909 BY FRED T. JANE

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## FOREWORD

In one of the most eventful years of aviation history, the star of the first truly international Farnborough air show, in England, was an aeroplane designed fifteen years ago and no longer in production. Such remarks do not disparage in any way the remarkable Lockheed SR-71A, or its achievement in flying over the Atlantic between New York and London in 1 hour 55 minutes 42 seconds as a curtain raiser to the show. They simply reflect how little the general public knows about the capabilities of the present-day aerospace industry and its products.

The SR-71A could have set up this intercontinental speed record at any time during the past decade. Yet, all the speed records in the world are insignificant by comparison with what the incredible "Blackbird" has done in its primary duty as a strategic reconnaissance aircraft, in the interests of world peace. Only when a major confrontation occurs, like the Cuban missile crisis of 1962, does public attention focus momentarily on one aspect of the work of what the newspapers call "spyplanes", of both East and West. Most of the time, most people fail to grasp the significance of such officially-issued statements as: "The UK Air Defence Region (UKADR) during recent years has received more 'trade' from Soviet long-range aircraft flying round the North Cape and down towards the British Isles than any other NATO air defence region".

These particular Soviet aircraft are engaged on electronic intelligence and reconnaissance missions, probing the NATO defences. What, one wonders, would be the public reaction to a suggestion that "flying saucers" observed over countries like West Germany and Sweden have a connection with never-mentioned Soviet RPVs? Nearly ten years have gone by since the Chinese first displayed the remains of US pilotless reconnaissance aircraft in Peking; and the Russians must appreciate the advantages of such vehicles as much as anyone else after what Teledyne Ryan RPVs achieved subsequently in Vietnam.

Peacetime reconnaissance and electronic intelligence gathering are a part of everyday life that must not be broadcast too blatantly. Often, the public is equally oblivious to aviation achievements and potential which carry no tag of secrecy and of which it should rightly be proud.

For example, on 17 June 1974, the second pre-production Concorde took off from Boston, Massachusetts, at the same time as an Air France Boeing 747 left Paris on a normal scheduled service to Boston. The SST landed at the French capital's new Charles de Gaulle Airport after a flight time of 3 hours 10 minutes. One hour and 8 minutes later, refuelled and revictualled, the Concorde took off on the return journey to Boston, recording a westbound flight time of 3 hours 8 minutes. In doing so it landed before the 747, having made the round trip in less than the normal time for a one-way crossing.

Surely this was as remarkable as the SR-71A's record dash—especially as the Concorde carried in each direction a payload of almost 26,500 lb (12,000 kg), the full entry-into-service figure promised by its makers. Yet how many people in Britain are aware of this demonstration of the aircraft's potential, and feel a glow of pride as warm as the cheers of the French schoolchildren who welcomed it in Paris with waving Tricolours, Union Jacks and Stars and Stripes? And what has been done officially to encourage more interest?

It is easy to feel, in the light of seventeen years of bitter experience, that Britain's governments continue, quite deliberately, to underrate its aerospace industry. Remembering the TSR.2, Rotodyne, HS 1154 and other cancelled programmes, there could well be truth in the suggestion that Concorde, too, would have been abandoned by the UK had not a high proportion of the British workers engaged on the project been situated in the parliamentary constituency of the Secretary of State for Industry. No government can ignore voters, and similar thoughts have been expressed in the USA, where the Texas-built F-111 and A-7 combat aircraft (though none would deny their excellence) are maintained in production at a time when the manufacturers of newer, vitally-needed combat aircraft, in other States, have to fight for every budgetary cent, not always successfully.

Those who control the purse-strings of nations are not to be envied in times of inflation, when development of the Concorde costs more than £1,000 million over twelve years, and the price of evolving a bomber like the Rockwell B-1 averages nearly \$500 million (£200 million) a year. There is however another side to the coin. Concorde keeps 40,000 Europeans at work on a product of advanced technology for which even the United States can provide no competitor. As for the B-1, the mere fact that we are all alive in a nuclear age, despite wide international differences, provides the best argument for a viable East-West deterrent policy, however costly, until greed and political aspirations are replaced by finer qualities.

We are a long way from such an idyllic age. Indeed, there has never been a grimmer period for the entire worldwide aerospace industry than the present time. For the manufacturing industry and airlines, economic problems—not divorced from international political manoeuvring—are causing even the giants to falter. After the collapse and government takeover of Rolls-Royce in 1971, we have Lockheed seemingly in perpetual difficulty in America, and Pan

American and TWA asking for assistance in surviving anticipated losses of \$76 million and \$65 million respectively in 1974. Pan American has requested a temporary subsidy of \$10.2 million a month. Mergers are proposed as a possible solution to troubles in America; nationalisation is advanced as the panacea for Britain. Neither of these courses will solve the long-term problems.

However much the aerospace industry earns—and the UK industry alone reported export sales worth over £500 million in 1973—it is unlikely to attain permanent economic stability, or be able to take full advantage of the higher performance and greater safety offered by advanced technology, until some airline operations are run as a public service rather than as a profit (or loss) making venture. This does not necessarily imply state ownership; but state subsidies must become more common unless supersonic travel is to remain a dream and low-cost family holidays in the sun are to be a memory of the past.

It is unthinkable that supersonic travel will be provided only by the Soviet Union and other non-capitalist nations; and faith in the future of Concorde grows stronger with each passing month. However, some current problems are more complicated, requiring a massive expenditure of expertise as well as money. A good start has been made on tackling the environmental problems of noise and smoke pollution, but much remains to be achieved. Also, while the increased cost of aviation fuels has created much of the present financial crisis, a greater long-term problem is the depletion of the world's hydrocarbon fuel reserves.

The solution may well lay in the eventual use of liquid hydrogen fuel, now that the manned space programmes have shown that it can be manufactured, handled and used safely in very large quantities. This is no place to examine exhaustively the ways in which liquid hydrogen might replace kerosene and gasoline in aircraft. Suffice it to say that the project design teams of some of the world's leading manufacturers have worked out the basic configurations of airliners that might run on liquid hydrogen. Models tested in wind tunnels by companies like McDonnell Douglas have given results suggesting that full-scale versions might be carrying passengers in everyday service by the turn of the century. One interesting conclusion is that the new fuel not only makes possible intercontinental aircraft able to carry 500 passengers at Mach 6 to Mach 9, but would be equally suitable for 1,000-seat subsonic "Jumbos". Furthermore, liquid hydrogen is the cleanest-burning of all fuels, and might offer solutions to both airport noise and in-flight sonic boom problems, when allied to advanced design.

Any nation incapable of developing and building these enormously-expensive aircraft of the future might well earn a living from producing the liquid hydrogen fuel, which does not require the geographical good fortune of living over an oil well.

\* \* \* \* \*

Despite a multitude of economic and political pressures, the past year has brought significant and exciting aerospace developments. The "First flights" list includes the first and second production Concorde; America's YF-16 and YF-17 lightweight fighters, promising lower-cost effectiveness through new design concepts; the Dali-esque Boeing and Teledyne Ryan Compass Cope high-altitude intelligence-gathering RPVs; Martin Marietta's X-24B dart-like wingless research aircraft; the world's first electrically-powered aeroplane (Military MB-E1); the first production European Airbus; the long-awaited Panavia MRCA, on which the whole future of the Royal Air Force depends; and the Sikorsky YCH-53E, which has flown at an all-up weight of 70,000 lb (31,750 kg), greater than any other helicopter outside the Soviet Union.

First flight dates can seldom be attached to new Soviet aircraft, particularly combat types; but this issue of *Jane's* records much that has not hitherto been published. Dimensions quoted for the Mi-24 ("Hind") helicopter suggest that it is considerably smaller than has been reported elsewhere. There is an informative new photograph of the Tu-28P ("Fiddler"). The version of the MiG-21 known as "Fishbed-K" is shown right-way-round for the first time (pitot boom on the starboard side); and "Fishbed-L" is identified and illustrated. Much that is new can be learned about types such as the MiG-23 ("Flogger"), MiG-25 ("Foxbat"), Su-15 ("Flagon"), the latest "Bear-F" version of the Tu-95, the variable-geometry bomber known to NATO as "Backfire", and a new "Brewer-E" version of the Yak-28.

In the Addenda, among a multitude of late news items, is a brief reference to a new Soviet tandem-delta bomber. This has an all-up weight not far short of that of the B-1, and a potential that may well cause the US Department of Defense to reconsider its FY1975 budget remark that "In recognition of the reduced threat of a massive bomber attack, (all) the Nike-Hercules surface-to-air missile (SAM) batteries located in the United States, and some fighter interceptor squadrons, are being phased out".

More detailed information reveals that all Aerospace Defense Command's F-102 interceptors will have followed the Nike-Hercules SAMs into retirement by mid-1976, but that some or all of its 242 F-106s and 124 F-101s could be retained throughout the decade. Also, squadrons of F-14 and F-15 fighters and SAM-D missiles

"could augment continental US defences; but, of course, these are the same forces that frequently are deployed elsewhere in a crisis".

Clearly, there are many in high places in the Pentagon who believe that there is little point in providing a defence against Soviet bombers while the SALT agreement leaves both the USA and Soviet Union wide open to annihilation by nuclear strategic missiles. This takes into account the fact that the Red Air Force deploys only 140 intercontinental bombers at the present time and that, except for the new swing-wing "Backfires", they could be despatched on little but one-way missions against the USA.

Russia, on the other hand, needs to plan for defence against some 500 American B-52 and FB-111 intercontinental bombers, with the B-1 as a possible follow-on, unrestricted by the current SALT agreement. For this reason, it has in 1974 more than 2,500 interceptors and 9,800 SAM launchers, compared with America's year-end total of some 500 interceptors and no SAMs.

The composition of the Soviet fighter defence force is interesting. The Yak-28P ("Firebar"), Tu-28P ("Fiddler"), Su-15 ("Flagon") and MiG-25 ("Foxbat") equip 50% of the interceptor units, with the Su-9 and Su-11 ("Fishpot-B and C") accounting for 25%, and the vintage MiG-17 ("Fresco") and MiG-19 ("Farmer") still soldiering on in the other 25%.

The Arab-Israeli Yom Kippur War of October 1973 gave a false impression of the effectiveness of the Soviet SAMs, as did engagements in Vietnam. In the Suez Canal zone and around Hanoi the missile defences were massed in concentrations that could never be matched in countries as large as the Soviet Union and USA, with many widely-dispersed targets. Nor did Soviet air-to-air missiles impress the Israelis, who admitted the loss of only six aircraft in air combat in October 1973, against some 335 Arab aircraft, more than half of which were destroyed by Shafrir "dogfight" missiles.

There is no need for further explanation of why the USA is putting so much effort into improving the close-range capability of its own air-to-air missiles. It may also be significant that, in an apparent *volte-face*, the USAF is now considering the purchase of several hundred General Dynamics F-16 or Northrop F-17 light-weight fighters after prototype evaluation has been completed. With their high thrust-to-weight ratios, superb manoeuvrability and advanced features, allied to dogfight missiles, such aircraft could well fill the gap if the USAF discovered an urgent need for a successor to the once-planned last-of-the-line F-106.

The Soviet Union has no illusions concerning a continued need for interceptors. Hence a warning by the Chairman of the US Joint Chiefs of Staff in early 1974 that "By the late 1970s, the Soviet Union may have interceptors with a look-down/shoot-down radar/missile system, and may deploy a new AWACS (airborne warning and control system aircraft) with a look-down capability over land, as well as water. Such an interceptor/AWACS force could pose a formidable threat to our bombers". Preparing for that threat, the USAF is fitting new devices to its B-52 bombers to improve their survivability, and is evolving for its attack forces a complete range of new strategic cruise missiles, defence suppression missiles and other weapons, of which details can be found for the first time in *Jane's* this year.

Throughout the entire book, the emphasis is now on advanced technology, with supercritical wings, fly-by-wire control systems, boron composite structures, upper-surface and lower-surface flap-blowing, terrain-following automatic control systems, turbo-ramjet engines, and a hundred other developments that were regarded so recently as highly experimental, now appearing as features of production aeroplanes. The Spitfire could be covered in 370 words and six lines of specification data in the 1939 *Jane's*. More words are needed today to list the electronics and equipment of an aircraft like the MRCA. The entries on this aircraft and the SR-71A alone represent many days of work, as the manufacturers were not permitted to supply the raw material in such detail or even to comment officially on the end product. These are, therefore, two of the very few entries in the book—outside the Soviet and Chinese sections—that do not contain 100% officially-authenticated data.

It is a matter of considerable pride to record that no aircraft manufacturing nation in the world refuses any longer to supply information to *Jane's*. There could be no better indication of the regard in which it is held, or its value to professional readers, who would be quick to note and point out any item that was more wishful than accurate.

\* \* \* \* \*

Competition among the manufacturing nations remains particularly intense in the military field. This can lead to acrimony when a company appears to be "pushing" its own in-house product at the expense of one developed and manufactured with a foreign partner. In general, however, manufacturers throughout the world are becoming increasingly dependent on each other—not usually to take advantage of superior skills, but to smooth out the "peaks and troughs" that would otherwise have a disastrous effect on employment and the utilisation of facilities during the development/production/rundown life cycle of any product.

A glance through the introductory copy under individual company entries in this edition will give some idea of the extent of the subcontracting. Kawasaki of Japan is found to be manufacturing doors for the Lockheed TriStar and wing flaps for the Boeing 747SP. CASA of Spain builds outer wings for the Dassault Falcon 10. The Australian Government Aircraft Factories produce rudders and elevators for the Boeing 727. More surprisingly, while Shorts are busy building wings for the Fokker-VFW Fellowship in Ireland, Fokker-VFW is responsible for producing the outer wings of Shorts' SD3-30 at Amsterdam. One might feel, wrongly, that only a computer could prove the logic of that exchange!

In terms of large subsonic transport aircraft, America's grasp of the market becomes increasingly apparent. Airlines like EgyptAir, CAAC of China and Tarom of Romania, which once operated Soviet Antonovs, Ilyushins and Tupolevs almost exclusively, now fly Boeings. CAAC is even running British Airways' European Division close second as a Trident operator. This fact and the so far modest but promising growth of interest in the A-300 Airbus, shows that Europe can still find a place in the market for medium-size commercial transports and this, together with economic considerations, explains a development that was announced as these pages were being written.

In the words of the official statement, BAC and Hawker Siddeley of the UK, Aérospatiale of France, and Dornier, MBB and VFW-Fokker of Germany have agreed "to work together in order to meet European airline requirements of the 1980s". Officials of the various companies have stressed that discussions are at a very early stage, and no decisions have been taken on the actual type or size of the aircraft that will feature in the programme. Other European companies may eventually be brought into the group, and co-operation will be extended, as far as possible, to all European airlines.

This could prove a most significant step. The six companies involved initially have immense experience and competence, with current products that include the A-300 Airbus and Concorde. Statistics quoted in this edition indicate the success already achieved with other new European co-production aircraft like the Jaguar and Gazelle helicopter, and this is paralleled by some more-individual products.

Indeed, the second half of the 1970s promises to bring increasing prosperity to Europe's aerospace industry after several difficult years. Dassault of France is still very much in the running for important contracts to supply next-generation fighters to the Netherlands, Belgium, Denmark and Norway, although the Anglo-French Jaguar must be regarded as a strong "outsider", and the US is offering highly attractive offset contracts should these NATO nations settle for the winner of its F-16/F-17 evaluation. Both the Franco-German Alpha Jet and the British Hawker Siddeley Hawk seem assured of long production runs as dual-purpose attack/trainers, and the latter could well prove as universally popular as its illustrious predecessor, the Hunter.

Britten-Norman has passed the 650 mark with sales of its Islander family, which thus rates as the most-produced British commercial transport design of all time. Manufacture is becoming as worldwide as sales, now that assembly lines in Belgium and Romania are to be joined by a licence production line in the Philippines, where the Islander has been selected as the aeroplane on which that nation will found its aircraft industry.

In the same local-service field, Shorts continue to find customers for their utilitarian Skyvan, which has exceeded 100 sales, and had announced first orders worth nearly £3 million for their new 30-seat SD3-30 within three weeks of the prototype's first flight. As with Ireland, so too with Scotland, where the Scottish Aviation Bulldog trainer, having been selected as standard equipment for seven air forces including the RAF, is now to seek a new lease of life with retractable landing gear.

Several other nations outside the "big four" continue to produce high-quality specialised aircraft that find a ready market.

Czechoslovakia has repeated its earlier success with the L-29 Delfin by having the L-39 adopted as the standard jet trainer of all Warsaw Pact countries except Poland. This Soviet policy of encouraging its political partners to undertake responsibility for certain categories of aircraft is of benefit also to the Polish industry, which continues as sole source for the Russian-designed Mi-2 helicopter and now has prospect of very large contracts for the unique turbofan-powered M-15 agricultural aircraft, as a successor to the An-2.

Another country whose thriving modern industry owed much initially to Soviet influence is China. Its entry in *Jane's* grows only slowly in length but more rapidly in authenticity as China's contacts with the Western World become more firm and trusting. This is pleasing, because the quality of Chinese manufacture is exceptionally high, as Pakistan learned from its F-6 fighters. It will be interesting to have, eventually, further information on the new F-9 fighter and the helicopters which owe more to indigenous design and development.



The basic lesson taught by a close study of *Jane's* is that every industrial nation needs a highly-competent aircraft industry of its own if it is to be assured of meeting its precise needs. On a small scale, the Philippines will obtain the light utility transport required to improve communications between 7,000 islands by building the Islander and helping to evolve an amphibian version of it. In the military field, where else in the world could Japan have acquired a superb modern anti-submarine flying-boat like the Shin Meiwa PS-1, and where could Sweden have shopped for a fighter like the Viggen, so precisely tailored to its highly-individual defence philosophy?

The overall excellence of the Viggen is, in fact, having an influence on design thought in other countries. For proof one need only note the growing number of tandem-deltas under evaluation in the United States, and the new Soviet strategic bomber mentioned earlier.

\* \* \* \* \*

It is natural to concentrate most attention on the "Aircraft" section in the Foreword to *Jane's*, but the other parts of this 1974-75 edition are no less comprehensive, up-to-date and full of interest. The "RPVs", in particular, can be expected to grow in terms of both number of pages and importance, particularly now that a new generation of mini-RPVs is under development for the US Services. Security classification forbids the publication of many of the most fascinating facts and figures at the present time; but this promises to become one of the most eagerly-studied sections of *Jane's* in future years.

In the "Engines" section, the Rolls-Royce pages are of special interest. Four years ago, it seemed that Pratt & Whitney and General Electric were to be relieved of major European competition. As recently as the early months of 1974, a member of one of these companies was reported as saying that Rolls-Royce was "finished" and no longer to be regarded as a major developer/producer of aircraft power plants. Yet now the uprated RB.211 seems assured of the long-overdue government support it needs to become the engine for the long-range TriStar. It may also power the next batch of Boeing 747s for British Airways, and other operators, if Boeing can be convinced that the project is assured of continued UK government support.

Frequent references to "hush kits" and improved combustion systems emphasise the immense achievements of aero-engine manufacturers in reducing noise and smoke emission. The new generation of commercial power plants is cleaner and quieter than anyone would have believed possible a few years ago. This is a mixed blessing to the airlines, which—at a time of economic pressure—will be compelled to replace their older jet transports with quieter new types if they wish to continue operating into airports where stringent noise limitations apply. It means, of course, that the aircraft industry can expect orders for newer aircraft before the older types would normally have been retired or passed on to operators in less pollution-conscious parts of the world. This offers hope for good-neighbourly transports like the DH Canada Dash 7 and Dassault Mercure in a period when they might otherwise have failed to find customers, however attractive their potential.

As a change from recent years, the "Spaceflight" section seems to present no dramatic story this time. After pictures of men walking and driving on the Moon, this is understandable; but how blasé can one get? Here are satellites which often provide advance warning of hurricanes, and so prevent disasters like that which killed thousands of people in Honduras in September 1974. Here, too, is the spacecraft that journeyed to Venus and Mercury earlier this year. Is its achievement lessened because the products of scientific research fail to confirm the fantasies of science fiction?

We are on a technology plateau in the mid-1970s. The world air speed record, set by a near relative of the SR-71A, has remained unchallenged for a decade. No aeroplane flies any longer as fast or high as the X-15A flew in 1963-67. No men journey to the Moon. Nobody is building aircraft larger than the Boeing 747, and there seems little worldwide interest in carrying airline passengers at supersonic speed. The V/STOL Harrier, once portrayed as the brilliant pace-setter for a whole new breed of combat aircraft, is already valued so lightly in its homeland that the concept has been handed to America to develop—as it undoubtedly will.

This represents a sick, tired attitude in a world where too many manufacturers are now devoted to making money rather than aeroplanes. It will be a tragedy if such an attitude slows the pace of development, beyond the aircraft of today, towards the cleaner, quieter Mach 6 transports, the far higher safety standards, and all the adventure and improved living standards that aviation and spaceflight offer us before the end of our century. Do we really want to exchange the dreams and achievements of the Wright brothers, A. V. Roe, Konstantin Tsiolkowsky, Igor Sikorsky, Charles Lindbergh, Frank Whittle, "Chuck" Yeager, Wernher von Braun, Neil Armstrong and thousands of other aerospace pioneers for the transient satisfaction of a Midas touch?

## ACKNOWLEDGEMENTS

So many people have contributed to this edition of *Jane's All the World's Aircraft* that to thank them all individually would be a task as formidable as compiling an aerospace "Who's Who". Correspondence arrives from many companies over the signatures of Presidents, Managing Directors and Chief Designers, who add to a wealth of facts, figures and photographs the kind of comments and suggestions that make all the effort of compiling *Jane's* seem so very worthwhile. This year, a letter from Piper, a company that has had to overcome immense difficulties during the past two years, stated that one of its senior engineers had spent many dozens of manhours checking, updating and supplementing its entries to the high standard of accuracy at which it knew we aimed. To that unnamed engineer, as representative of so many others throughout the world, known and unknown to us personally, the editorial team sends its sincere thanks.

This team is unchanged from previous years, although individual responsibilities have been switched slightly to speed production of the first 200 pages of the book, as listed on the Contents page. No editor could ask for more concentrated effort, or higher standards of compilation than Assistant Editor Kenneth Munson, David Mondey, Bill Gunston, Michael Taylor, Maurice Allward and Lord Ventry achieve in their individual sections of the work. Nor could anyone wish for better three-view drawings than those produced by Dennis Punnett of Pilot Press, Roy Grainge, Michael Badrocke and Tony Mitchell.

*Jane's* has a new American publisher this year—an important happening for a book that has borne the imprint of only one UK publisher, been produced by a single UK printer, and been compiled by only four Editors in its 65 years. We look forward to building up a partnership with Franklin Watts of New York as happy and mutually profitable as that we have enjoyed since 1971 with our good friends of *Air Force Magazine* (Washington), which continues to publish regular *Jane's Supplements* and features.

Once again, a complete and carefully set-out revision of the Romanian sections of the book was supplied by General Ing Stefan Ispas, Head of the Romanian Aircraft Industry, and Viorel Popescu of the Romanian Embassy Commercial Office in London. Considerable help with other sections came from Alex Reinhard (Argentina), Pierre Sparaco (Belgium), Ronaldo Olive (Brazil), Vico Rosaspina (Italy), Eiichiro Sekigawa (Japan), Dr Ulrich Haller (Switzerland), Wolfgang Wagner of *Deutscher Aerokurier* (Germany), Andrzej Glass and Andrzej Korczak of the *Biuletyn Informacyjny Instytutu Lotnictwa* (Poland), William Green and Gordon Swanborough of *Air International* (UK), Alan Hall of *Aviation News* (UK), the editorial staffs of *Flight International* (UK), *Aviation Magazine International* and *Air et Cosmos* (France), *Repules* (Hungary), *Letectvi + Kosmonautika* (Czechoslovakia) and *AiReview* (Japan), the staff of *Tass* and *Aviaexport* in Moscow, and Théo Pirard of Belgium, whose immaculate notes added much to the spaceflight sections of countries like India, Italy and Spain. No less, our thanks go to Howard Levy, Jean Seele, Peter M. Bowers, Gordon S. Williams, Norman Taylor, Robert Lawson, and the other photographers whose superb prints supplement those obtained from industry and official sources, and to Norman Polmar who has worked so effectively as our correspondent in Washington.

Almost every individual entry has been updated with the assistance of company engineers and publicity staff, many of whom are valued as personal friends after so many years of productive collaboration. To them all, and to the members of government departments, news and photo agencies who provided help, we express grateful thanks.

One familiar name is missing from the list this year, for Janusz Babiejczuk of Poland, who did so much to raise the standard of his country's entries, was killed in a motor accident. His ever-willing help over so many years will not be forgotten.

October 1974

JWRT

## PHOTOGRAPHS

The Editor and Publishers receive many requests for prints of photographs that appear in *Jane's*. It is not possible for them to offer any form of photographic service; but photographs of a high proportion of the aircraft described in this edition, as well as of many earlier types, are available at normal trade rates from:

Air Portraits, 40 Chadcote Way, Catshill, Bromsgrove, Worcestershire

Flight International, Dorset House, Stamford Street, London SE1 9LU

Stephen Peltz, 9 Cambridge Square, London W.2

Three-view drawings are available to the press from:

Pilot Press Ltd, PO Box 16, Bromley, Kent BR2 7RB

Roy J. Grainge, 12 Bonaly Gardens, Colinton, Edinburgh EH13 0EX

# JANE'S ALL THE WORLD'S AIRCRAFT 1974-75

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## THE ARGENTINE REPUBLIC

AERO BOERO  
AERO TALLERES BOERO SRL

## HEAD OFFICE:

Boulevard H. Irigoyen 505, Morteros, Córdoba  
Telephone: Morteros 409

## DIRECTORS:

Cesar E. Boero  
Hector A. Boero

This company is producing and developing the Aero Boero 115 BS, 180 and 210/260 series of light monoplanes, and is developing the AG.260 agricultural aircraft.

## AERO BOERO 115 BS

The earlier Aero Boero 95 (1969-70 *Jane's*) and Aero Boero 95/115 (1972-73 *Jane's*) are no longer in production, manufacture of the latter version having ended in January 1973. The current production version, first flown in February 1973, is known as the Aero Boero 115 BS. This has a sweptback fin and rudder, increased wing span and greater fuel capacity than the AB 95/115, to which it is otherwise generally similar.

The description which follows applies to the AB 115 BS, of which 20 are under construction initially:

## TYPE: Three-seat light aircraft.

WINGS: Braced high-wing monoplane. Wing section NACA 23012. Dihedral 1° 45'. Incidence 3° at root, 1° at tip. Light alloy structure, Ceconite-covered. Streamline-section Vee bracing strut each side. Aluminium alloy ailerons and flaps.

FUSELAGE: SAE 4130 steel-tube structure, Ceconite-covered.

TAIL UNIT: Wire-braced welded steel-tube structure, Ceconite-covered. Sweptback vertical surfaces.

LANDING GEAR: Non-retractable tailwheel type. Shock-absorption by helicoidal springs inside fuselage. Main-wheel tyre size 6-00-6, pressure 24 lb/sq in (1.69 kg/cm<sup>2</sup>). Hydraulic disc brakes. Fully-castoring steerable tailwheel.

POWER PLANT: One 115 hp Lycoming O-235-C2A four-cylinder horizontally-opposed aircooled engine, driving either a McCauley 1C90-7345 or a Sensenich 72CK-050 fixed-pitch propeller. Two wing fuel tanks, total capacity 28.5 Imp gallons (130 litres).

ACCOMMODATION: Normal accommodation for pilot and two passengers in enclosed cabin. Baggage compartment on port side, aft of cabin. Ambulance version can accommodate one stretcher in place of the two passengers.

ELECTRONICS AND EQUIPMENT: One 40A alternator and one 12V battery. VHF radio standard. Provision for dual controls, and night or blind-flying equipment, at customer's option.

## DIMENSIONS, EXTERNAL:

Wing span	35 ft 2 in (10.72 m)
Wing chord (constant)	5 ft 3½ in (1.61 m)
Wing aspect ratio	7.05
Length overall	23 ft 10¼ in (7.273 m)
Height overall	6 ft 10¼ in (2.10 m)
Wheel track	6 ft 8¼ in (2.05 m)
Wheelbase	16 ft 8¼ in (5.10 m)

## DIMENSIONS, INTERNAL:

Cabin: Length	6 ft 3 in (1.90 m)
Max width	2 ft 9 in (0.84 m)
Max height	3 ft 11¼ in (1.20 m)

## AREAS:

As for Aero Boero 180 RV and RVR

## WEIGHTS AND LOADINGS:

Weight empty, equipped	1,168 lb (530 kg)
Max T-O weight	1,697 lb (770 kg)
Max wing loading	9.65 lb/sq ft (47.1 kg/m <sup>2</sup> )
Max power loading	14.77 lb/hp (6.7 kg/hp)

PERFORMANCE (at max T-O weight, except where indicated):

Max level speed at S/L	113 knots (130 mph; 210 km/h)
Max cruising speed at S/L	102 knots (117 mph; 188 km/h)
Stalling speed, flaps down	39 knots (45 mph; 72 km/h)
Max rate of climb at S/L	1,000 ft (300 m)/min
T-O run, full load	380 ft (115 m)
T-O to 50 ft (15 m), two persons	607 ft (185 m)
Landing from 50 ft (15 m)	500 ft (150 m)
Landing run, heavy braking	150 ft (45 m)
Range with max fuel	429 nm (495 miles; 800 km)

## AERO BOERO 180 RV and RVR

The original three-seat Aero Boero 180 (1972-73 *Jane's*) was designed as a light, all-purpose aircraft; the first production example was delivered in December 1969.

Production of this version was followed by that of the Aero Boero 180 RV (standard version) and 180 RVR (glider-towing version), the first of which flew for the first time in October 1972. These current versions have extended-span wings, similar to those of the AB 115 BS, increased fuel capacity, a recontoured fuselage and sweptback vertical tail surfaces.

The description which follows applies to the AB 180 RV and 180 RVR. Seven 180 RVs had

been built and five more ordered by February 1974.

## TYPE: Three-seat light aircraft.

WINGS: Strut-braced high-wing monoplane. Streamline-section Vee bracing strut each side. Wing section NACA 23012. Dihedral 1° 45'. Incidence 3° at root, 1° at tip. Light alloy structure, covered with Ceconite. Ailerons and flaps of aluminium alloy construction.

FUSELAGE: Welded steel-tube structure (SAE 4130), covered with Ceconite.

TAIL UNIT: Wire-braced welded steel-tube structure, covered with Ceconite. Sweptback vertical surfaces. Ground-adjustable tab on rudder.

LANDING GEAR: Non-retractable tailwheel type, with shock-absorption by helicoidal springs inside fuselage. Main wheels and tyres size 6-00-6, pressure 24 lb/sq in (1.69 kg/cm<sup>2</sup>). Hydraulic disc brakes. Tailwheel steerable and fully castoring.

POWER PLANT: One 180 hp Lycoming O-360-A1A four-cylinder horizontally-opposed aircooled engine, driving (according to customer's choice) either a Hartzell constant-speed or McCauley 1A200 or Sensenich 762 fixed-pitch propeller. Two wing fuel tanks, total capacity 35 Imp gallons (160 litres).

ACCOMMODATION: Normal accommodation for pilot and two passengers in enclosed cabin. Baggage compartment on port side, aft of cabin. Transparent roof panel in 180 RVR.

ELECTRONICS AND EQUIPMENT: One 40A alternator and one 12V battery. VHF radio standard. Provision for night or blind-flying instrument-

ation at customer's option. Towing hook in 180 RVR.

## DIMENSIONS, EXTERNAL:

Wing span	35 ft 2 in (10.72 m)
Wing chord (constant)	5 ft 3½ in (1.61 m)
Wing aspect ratio	7.05
Length overall	23 ft 10¼ in (7.273 m)
Height overall	6 ft 10¼ in (2.10 m)
Wheel track	6 ft 8¼ in (2.05 m)
Wheelbase	16 ft 8¼ in (5.10 m)

## AREAS:

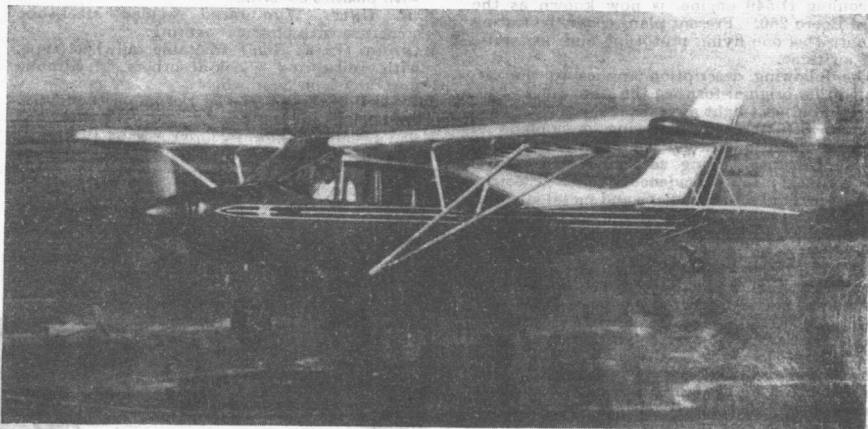
Wings, gross	177.3 sq ft (16.47 m <sup>2</sup> )
Ailerons (total)	19.81 sq ft (1.84 m <sup>2</sup> )
Flaps (total)	20.9 sq ft (1.94 m <sup>2</sup> )
Fin	10.01 sq ft (0.93 m <sup>2</sup> )
Rudder	4.41 sq ft (0.41 m <sup>2</sup> )
Tailplane	15.07 sq ft (1.40 m <sup>2</sup> )
Elevators	10.44 sq ft (0.97 m <sup>2</sup> )

## WEIGHTS AND LOADINGS:

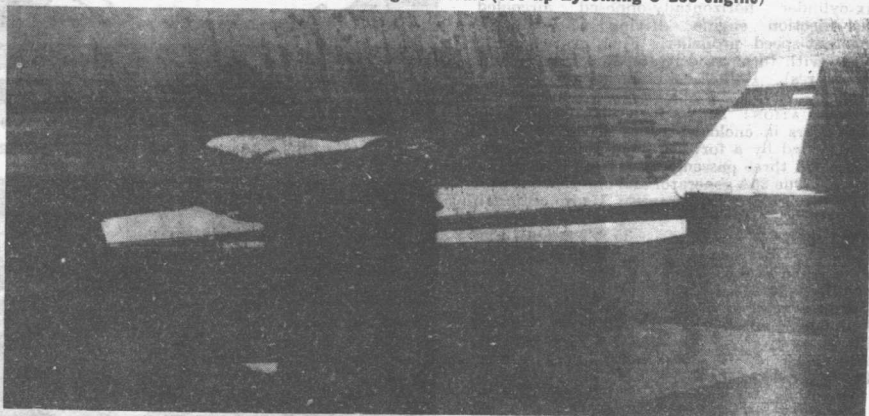
Weight empty, equipped	1,212 lb (550 kg)
Max T-O weight	1,860 lb (844 kg)
Max wing loading	10.7 lb/sq ft (52.0 kg/m <sup>2</sup> )
Max power loading	10.36 lb/hp (4.7 kg/hp)

PERFORMANCE (at max T-O weight, except where indicated):

Max never-exceed speed	134 knots (155 mph; 249 km/h)
Max level speed at S/L:	
RV	132 knots (152 mph; 245 km/h)
RVR	122 knots (140 mph; 225 km/h)
Max cruising speed at S/L	114 knots (131 mph; 211 km/h)
Stalling speed, flaps down	41.5 knots (48 mph; 77 km/h)
Max rate of climb at S/L	1,180 ft (360 m)/min



Aero Boero 115 BS three-seat light aircraft (115 hp Lycoming O-235 engine)



Aero Boero 180 RV three-seat light aircraft (180 hp Lycoming O-360-A1A engine)



Aero Boero 180 Condor light aircraft, with ventral pack for air-droppable cargo

## 2 ARGENTINE REPUBLIC: AIRCRAFT—AERO BOERO / AL-AIRE

Time to 1,970 ft (600 m), 75% power, with Blanik two-seat sailplane 3 min 10 sec  
 Service ceiling 22,000 ft (6,700 m)  
 T-O run 330 ft (100 m)  
 T-O to 50 ft (15 m), two persons 615 ft (188 m)  
 Landing from 50 ft (15 m) 525 ft (160 m)  
 Landing run 195 ft (60 m)  
 Range with max fuel 429 nm (495 miles; 800 km)

### AERO BOERO 180 CONDOR

This version of the AB 180 was evolved for high-altitude flying in the area of the Andes. It differs from the standard AB 180 in having accommodation for a pilot and one passenger only (with baggage space aft of the rear seat), modified wingtips and an optional turbocharger for the Lycoming O-360-A1A engine. Instead of a passenger, 220 lb (100 kg) of air-droppable cargo can be carried in an under-fuselage pack.

By February 1973 four Condors had been completed. None were in production in mid-1974.

#### WEIGHT:

Max T-O weight 1,860 lb (844 kg)

#### PERFORMANCE (at max T-O weight):

Max level speed 117 knots (135 mph; 217 km/h)  
 Max cruising speed at S/L 109 knots (125 mph; 201 km/h)  
 Max speed with cargo pack door open 78 knots (90 mph; 145 km/h)

### AERO BOERO 210 and 260

Design of the Aero Boero 210 four-seat light aircraft was begun in 1968, and a prototype was flown for the first time on 22 April 1971. A static test airframe has also been completed.

The same prototype, re-engined with a 260 hp Lycoming O-540 engine, is now known as the Aero Boero 260. Present plans cover the testing of only this one flying prototype and one static test airframe.

The following description applies to the aircraft in its original form as the Aero Boero 210:

#### TYPE: Four-seat light aircraft.

**WINGS:** Strut-braced high-wing monoplane of mixed metal and wood construction, covered with Ceconite. Wing section NACA 23012. Dihedral 1° 45'. Incidence 2° 30'. Electrically-operated all-metal flaps and metal ailerons.

**FUSELAGE:** Conventional semi-monocoque structure of welded steel tube (SAE 4130), with Ceconite covering.

**TAIL UNIT:** Conventional single sweptback fin and rudder of welded steel tube construction, Ceconite covered. Fixed-incidence strut- and wire-braced tailplane. Trim tab in elevator.

**LANDING GEAR:** Non-retractable tricycle type, with coil spring shock-absorbers. Main-wheel tyre pressure 28 lb/sq in (1.97 kg/cm<sup>2</sup>). Hydraulic disc brakes on main wheels. Streamline fairings over all three wheels.

**POWER PLANT:** One 210 hp Continental IO-360 six-cylinder horizontally-opposed aircooled fuel-injection engine, driving a two-blade constant-speed propeller. Fuel in two wing tanks with total capacity of 35.2 Imp gallons (160 litres). Refuelling point on top of each wing.

**ACCOMMODATION:** Seats for pilot and three passengers in enclosed cabin, access to which is provided by a forward-hinged door on each side. All three passenger seats are removable.

**SYSTEMS:** One 25A generator and one 12V battery.

**ELECTRONICS AND EQUIPMENT:** Radio optional.

#### DIMENSIONS, EXTERNAL:

Wing span 35 ft 2 in (10.72 m)  
 Wing chord (constant) 5 ft 3 1/4 in (1.61 m)  
 Wing aspect ratio 6.62  
 Length overall 24 ft 3 1/4 in (7.40 m)  
 Height overall 8 ft 10 1/4 in (2.70 m)  
 Tailplane span 10 ft 0 in (3.04 m)  
 Wheel track 7 ft 2 1/4 in (2.20 m)  
 Wheelbase 6 ft 1 1/4 in (1.875 m)

#### Passenger doors (each):

Height 3 ft 0 in (0.91 m)  
 Width 2 ft 7 in (0.79 m)

#### Baggage door (port, aft):

Height 1 ft 8 in (0.51 m)  
 Width 1 ft 8 in (0.51 m)

#### DIMENSIONS, INTERNAL:

Cabin:  
 Max length 5 ft 8 in (1.73 m)  
 Max width 3 ft 1 in (0.94 m)  
 Max height 3 ft 11 in (1.19 m)  
 Floor area 12 sq ft (1.11 m<sup>2</sup>)  
 Volume 52 cu ft (1.50 m<sup>3</sup>)

#### AREAS:

Wings, gross 176.5 sq ft (16.40 m<sup>2</sup>)  
 Ailerons (total) 16.47 sq ft (1.53 m<sup>2</sup>)  
 Trailing-edge flaps (total) 19.37 sq ft (1.80 m<sup>2</sup>)

#### WEIGHTS AND LOADINGS:

Weight empty, equipped 1,477 lb (670 kg)  
 Max T-O weight 2,425 lb (1,100 kg)  
 Max wing loading 13.75 lb/sq ft (67 kg/m<sup>2</sup>)  
 Max power loading 11.57 lb/hp (5.25 kg/hp)

**PERFORMANCE (estimated, at max T-O weight):**  
 Max cruising speed at 5,900 ft (1,800 m) 122 knots (140 mph; 225 km/h)

Stalling speed, flaps down 48 knots (55 mph; 89 km/h)

Max rate of climb at S/L 1,180 ft (360 m)/min

Service ceiling 19,675 ft (6,000 m)

T-O run 558 ft (170 m)

T-O to 50 ft (15 m) 820 ft (250 m)

Landing run 427 ft (130 m)

Range with max fuel 429 nm (495 miles; 800 km)

### AERO BOERO AG.260

Aero Boero began the design of this single-seat agricultural monoplane in mid-1971, at which time it was known as the AG.235/260. Construction of a prototype began in October 1971, and this aircraft flew for the first time on 23 December 1972. A static test airframe has also been completed.

**TYPE:** Single-seat agricultural aircraft.

**WINGS:** Low-wing monoplane. Wing section NACA 23012. Dihedral 5°. Structure, including trailing-edge flaps and ailerons, is of aluminium alloy, Ceconite-covered, with single Vee bracing strut on each side.

**FUSELAGE:** Welded SAE 4130 steel-tube structure with plastics covering.

**TAIL UNIT:** Wire-braced welded steel-tube structure with plastics covering.

**LANDING GEAR:** Non-retractable tailwheel type, with coil-spring shock-absorbers. Hydraulic disc brakes on main wheels.

**POWER PLANT:** One 260 hp Lycoming O-540 six-cylinder horizontally-opposed aircooled engine, driving a McCauley P235/AFA 8456 two-blade propeller. Two wing fuel tanks, total capacity 35.2 Imp gallons (160 litres).

**ACCOMMODATION:** Pilot only, in enclosed cabin. Door on starboard side, which can be jettisoned

in an emergency. Cabin heated and ventilated by adjustable cool-air vents. Utility compartment on port side, aft of cabin.

**ELECTRONICS AND EQUIPMENT:** VHF radio standard. Non-corrosive glassfibre tank installed forward of cockpit, with capacity of 110 Imp gallons (500 litres) of liquid or 1,102 lb (500 kg) of dry chemical. Quick-dump valve, to jettison contents of tank in an emergency. Engine-driven pump.

#### DIMENSIONS, EXTERNAL:

Wing span 35 ft 9 in (10.90 m)  
 Wing chord (constant over most of span) 5 ft 3 1/4 in (1.61 m)

Wing aspect ratio 6.8

Length overall (tail up) 24 ft 5 1/4 in (7.45 m)

Height overall (tail up) 6 ft 2 1/4 in (1.90 m)

Tailplane span 9 ft 11 1/4 in (3.04 m)

Propeller diameter 7 ft 0 in (2.13 m)

#### DIMENSION, INTERNAL:

Hopper volume 17.66 cu ft (0.5 m<sup>3</sup>)

#### AREAS:

Wings, gross 177.28 sq ft (16.47 m<sup>2</sup>)

Ailerons (total) 19.81 sq ft (1.84 m<sup>2</sup>)

Flaps (total) 20.88 sq ft (1.94 m<sup>2</sup>)

Fin 10.01 sq ft (0.93 m<sup>2</sup>)

Rudder 4.41 sq ft (0.41 m<sup>2</sup>)

Tailplane 15.07 sq ft (1.40 m<sup>2</sup>)

Elevators 10.44 sq ft (0.97 m<sup>2</sup>)

#### WEIGHTS AND LOADINGS:

Weight empty 1,587 lb (720 kg)

Max T-O weight 2,976 lb (1,350 kg)

Max wing loading 15.83 lb/sq ft (77.28 kg/m<sup>2</sup>)

Max power loading 11.44 lb/hp (5.19 kg/hp)

#### PERFORMANCE (at max T-O weight):

Max never-exceed speed 117 knots (135 mph; 217 km/h)

Max cruising speed at S/L 109 knots (125 mph; 201 km/h)

Econ cruising speed 95.5 knots (110 mph; 177 km/h)

Stalling speed, flaps down 52.5 knots (60 mph; 97 km/h)

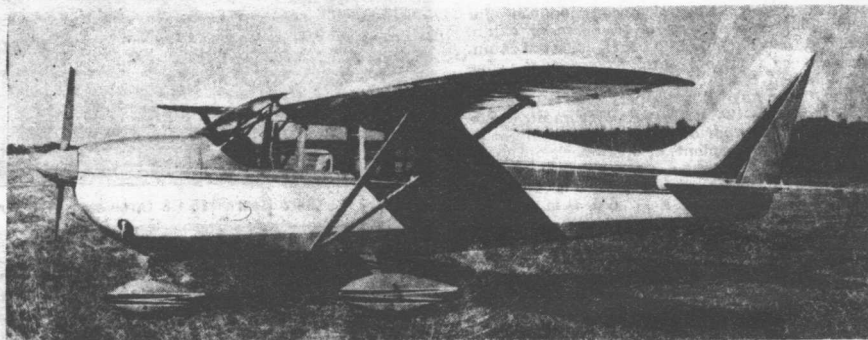
Max rate of climb at S/L 1,345 ft (410 m)/min

Service ceiling 21,000 ft (6,400 m)

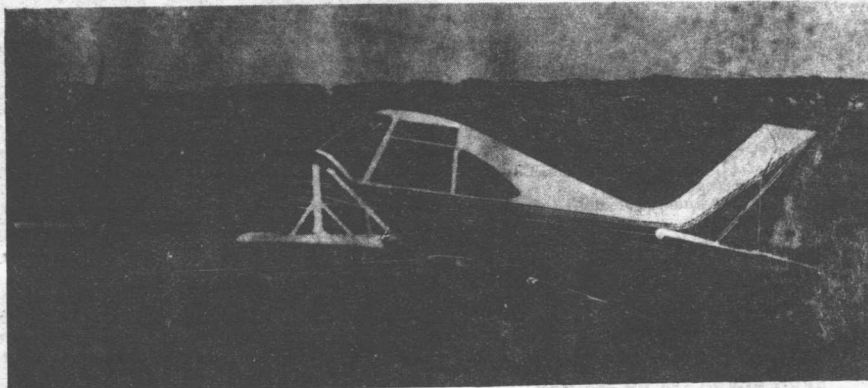
T-O to 50 ft (15 m) 656 ft (200 m)

Landing from 50 ft (15 m) 394 ft (120 m)

Range with max fuel 377 nm (435 miles; 700 km)



Aero Boero 210 four-seat light aircraft (210 hp Continental IO-360 engine)



Aero Boero AG.260 agricultural aircraft (260 hp Lycoming O-540 engine)

## AL-AIRE

### TALLERES AL-AIRE SCA

ADDRESS: Aerodromo San Fernando, Provincia Buenos Aires

Talleres Al-Aire SCA undertakes overhaul and repair work, up to fuselage rebuild standard, on light aircraft.

In addition to this work, its premises are currently in use by some of the members of AVEX (which see), who have under development a new

aerobatic training aircraft known as the T-11 Cacique, designed by Ing Alfredo Turbay. All known details of this aircraft follow:

#### TURBAY T-11 CACIQUE

A group of AVEX members, led by Ing Alfredo Turbay and including Prof Adolfo Yakstas and Sr Norberto S. Cobelo, began the development of this two-seat aerobatic and training aircraft as a potential replacement for the obsolete Piper types used by Argentine flying clubs. It is also suitable for observation and liaison duties.

The design was begun in February 1969 by Ing Turbay, and construction of a prototype began in mid-May of that year.

The following description applies to the prototype (LV-X44), which flew for the first time on 20 August 1970. No further news of this aircraft has been received during the past year.

**TYPE:** Two-seat training and aerobatic aircraft, stressed for ±6g.

**WINGS:** Cantilever high-wing monoplane, of laminar-flow profile. Wing section NACA





Prototype Turbay T-11 Cacique light aircraft (100 hp Continental O-200-A engine) (Alex Reinhard)

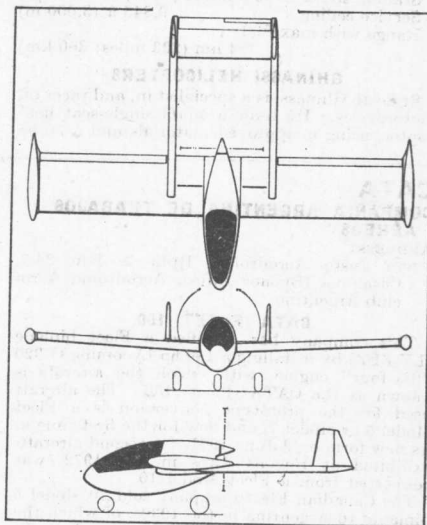
Fin	7.32 sq ft (0.68 m <sup>2</sup> )
Rudder	3.44 sq ft (0.32 m <sup>2</sup> )
Tailplane	24.5 sq ft (2.28 m <sup>2</sup> )
Elevators, incl tabs	11.2 sq ft (1.04 m <sup>2</sup> )

**WEIGHTS AND LOADINGS:**

Weight empty	716 lb (325 kg)
Max T-O weight (aerobatic)	1,323 lb (600 kg)
Max wing loading	11.5 lb/sq ft (56 kg/m <sup>2</sup> )
Max power loading	13.23 lb/hp (6 kg/hp)

**PERFORMANCE (estimated, at max T-O weight):**

Max never-exceed speed	194 knots (223.5 mph; 360 km/h)
Max level speed	119 knots (137 mph; 220 km/h)
Max cruising speed	108 knots (124 mph; 200 km/h)
Econ cruising speed	94 knots (108 mph; 174 km/h)
Stalling speed, flaps down	42.6 knots (49 mph; 79 km/h)
Max rate of climb at S/L	833 ft (254 m)/min
Service ceiling	17,390 ft (5,300 m)
Absolute ceiling	20,670 ft (6,300 m)
T-O run at S/L	377 ft (115 m)
T-O to 50 ft (15 m)	938 ft (286 m)
Landing from 50 ft (15 m)	476 ft (145 m)
Landing run	328 ft (100 m)
Range with max fuel	700 nm (807 miles; 1,300 km)
Range with max payload	458 nm (528 miles; 850 km)



Al-Aire AL-2 Tijerete single-seat light aircraft (Roy J. Grainger)

Wing section	Wortmann FX-168
Wing aspect ratio	5.6
<b>AREAS:</b>	
Wings, gross	86.11 sq ft (8.00 m <sup>2</sup> )
Vertical tail surfaces (total)	10.23 sq ft (0.95 m <sup>2</sup> )
Horizontal tail surfaces (total)	16.36 sq ft (1.52 m <sup>2</sup> )
<b>WEIGHT AND LOADING:</b>	
Max T-O weight	661 lb (300 kg)
Max wing loading	7.68 lb/sq ft (37.5 kg/m <sup>2</sup> )

**AL-AIRE AL-2 TIJERETE**

A prototype light aircraft, known as the AL-2 Tijerete (a small swallow-like bird), is under construction by Al-Aire. It is a single-seat mid-wing monoplane, of twin-boom configuration, powered by a 60 hp Franklin engine driving a pusher propeller. Construction is mainly of wood, with a balsa/plywood sandwich skin, except for the wingtip fuel tanks, which are of plastics, and the slender tailbooms, which are of duralumin. A tricycle landing gear is fitted.

**DIMENSIONS, EXTERNAL:**

Wing span	21 ft 11½ in (6.70 m)
-----------	-----------------------

Incidence 3°. No sweepback. Two-spar wooden structure, of constant chord except for cut-out in centre of trailing-edge. Leading-edges plywood-covered; remainder fabric-covered. Frise-type fabric-covered wooden ailerons. No tabs.

**FUSELAGE:** Conventional wooden box structure. Aluminium cowling panels; remainder plywood-covered except for fabric-covered top-decking.

**TAIL UNIT:** Cantilever wooden structure; plywood-covered fin and one-piece tailplane, fabric-covered rudder and elevators. No tabs. Rudder control by cables.

**LANDING GEAR:** Non-retractable tailwheel type. Glassfibre legs provide all necessary shock absorption. Main units have scooter wheels and brakes.

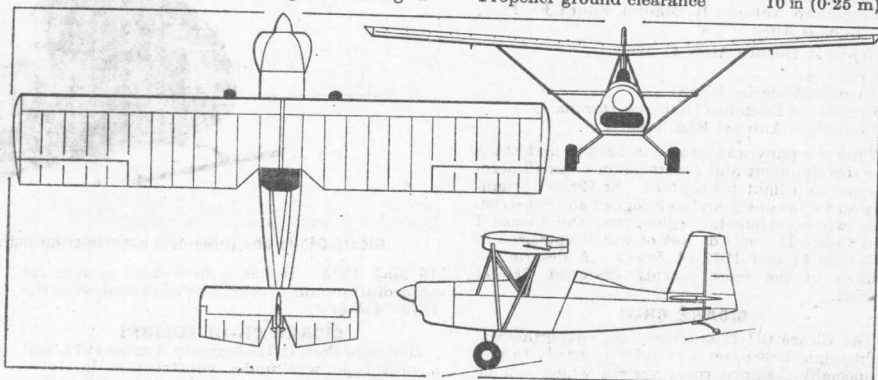
**POWER PLANT:** One 39 hp Citröen 3 CV motor-car engine, with reduction gear, driving a

two-blade fixed-pitch wooden propeller. Single fuel tank in fuselage, capacity 7.5 Imp gallons (35 litres). Refuelling point on top of fuselage aft of firewall. Oil capacity 0.66 Imp gallons (3 litres).

**ACCOMMODATION:** Single seat in open cockpit. Windscreens fitted. Headrest faired into top of fuselage.

**DIMENSIONS, EXTERNAL:**

Wing span (excl tip fairings)	22 ft 11½ in (7.00 m)
Wing chord (constant)	4 ft 1½ in (1.25 m)
Wing aspect ratio	5.6
Length overall	15 ft 5½ in (4.72 m)
Height overall (tail up)	6 ft 5½ in (1.96 m)
Tailplane span	7 ft 2½ in (2.20 m)
Wheel track	4 ft 7 in (1.40 m)
Propeller diameter	5 ft 3 in (1.60 m)
Propeller ground clearance	10 in (0.25 m)



Armar I Gorrion single-seat ultra-light aircraft (Sherwood Designs Ltd)

63A415 at root, NACA 63A212 at tip. Incidence 2° at root, 0° 30' at tip. Dihedral 3° on outer panels. Sweepback 4° at quarter-chord. All-metal Alclad-covered structure of one main spar and one auxiliary spar. Alclad Frise-type ailerons and semi-Fowler flaps on trailing-edge. No tabs.

**FUSELAGE:** All-metal semi-monocoque Alclad structure.

**TAIL UNIT:** Cantilever two-spar Alclad metal structure, similar to wings. Sweepback fin and rudder. Variable-incidence tailplane. Trim tab in each elevator.

**LANDING GEAR:** Non-retractable tricycle type, with glassfibre cantilever one-piece leg for main units. Steerable nose unit, fitted with maintenance-free polyurethane shock-absorber. Nosewheel tyre size 5-00-4, main-wheel tyres each 6-00-6; tyre pressure (all units) 22 lb/sq in (1.55 kg/cm<sup>2</sup>). Bendix hydraulic brakes.

**POWER PLANT:** One 100 hp Continental O-200-A four-cylinder horizontally-opposed aircooled engine, driving a McCauley two-blade fixed-pitch metal propeller. Two 4.4 Imp gallon (20 litre) wing fuel tanks and two 11 Imp gallon (50 litre) wingtip tanks. Total capacity 32 Imp gallons (140 litres). Refuelling point on top of each tip-tank.

**ACCOMMODATION:** Seats for two persons in tandem in fully-enclosed cabin, with access via forward-opening door on starboard side. Cabin heated and ventilated.

**SYSTEMS:** Electrical system includes 12V battery. **ELECTRONICS AND EQUIPMENT:** Blind-flying instrumentation standard. Optional VHF radio and ADF.

**DIMENSIONS, EXTERNAL:**

Wing span over tip-tanks	29 ft 6½ in (9.00 m)
Wing span without tip-tanks	27 ft 0½ in (8.24 m)

Wing chord at root	5 ft 1½ in (1.573 m)
Wing chord at tip	2 ft 9½ in (0.852 m)

Wing aspect ratio	7.5
Length overall	22 ft 1 in (6.73 m)

Length of fuselage	21 ft 8½ in (6.62 m)
Height overall	7 ft 8½ in (2.36 m)

Fuselage: max width over cowling	2 ft 9½ in (0.85 m)
Fuselage: max width aft of cowling	2 ft 6 in (0.76 m)

Tailplane span	8 ft 6½ in (2.60 m)
Wheel track	5 ft 7½ in (1.72 m)

Wheelbase	6 ft 4½ in (1.95 m)
Propeller diameter	5 ft 8½ in (1.75 m)

Propeller ground clearance	11½ in (0.30 m)
Passenger door (stbd):	

Height	3 ft 5½ in (1.05 m)
Width	3 ft 1½ in (0.95 m)

**DIMENSIONS, INTERNAL:**

Cabin: Length	5 ft 11 in (1.80 m)
Max width	2 ft 4½ in (0.72 m)
Max height	3 ft 9½ in (1.15 m)

**AREAS:**

Wings, gross	115.2 sq ft (10.70 m <sup>2</sup> )
Ailerons (total)	10.2 sq ft (0.95 m <sup>2</sup> )
Trailing-edge flaps (total)	16.1 sq ft (1.50 m <sup>2</sup> )

**AVEX**

**ASOCIACION ARGENTINA DE CONSTRUCTORES DE AVIONES EXPERIMENTALES**

**ADDRESS:** Acaasusso 1640, Olivos-FCNGBM, Buenos Aires

**Telephone:** 797-1629

**PRESIDENT:** Yves Arrambide

**SECRETARY:** Norberto Marino

AVEX is an Argentine light aircraft association for amateur constructors, similar in concept to the Experimental Aircraft Association in the US. It was formed in 1968 and its members include many people well known among the Argentine aircraft industry, including specialists in most aspects of materials and construction, including the use of glassfibre and plastics.

Some of the recent AVEX activities have been described in the 1971-72 and subsequent editions of *Jane's*. Of 33 current aircraft projects by AVEX members, two have already flown and several others are nearing completion. Details of the more important of these follow:

**ARRAMBIDE/MARINO  
ARMAR I GORRION (SPARROW)**

The Gorrion single-seat ultra-light aircraft was designed in collaboration by Mr Yves Arrambide and Sr Norberto Marino in 1971. Trial flights were made with a rubber-propelled one-fortieth scale model; construction of a full-scale prototype began on 30 April 1972, and this was scheduled to make its first flight in mid-1974. Two other Gorrions are under construction.

All available details of the Gorrion follow:

**TYPE:** Single-seat ultra-light aircraft.

**WINGS:** Parasol-wing monoplane. Centre-section braced by N strut on each side of upper fuselage, and outer panels by Vee struts from bottom of fuselage. Wing section NACA 4412 (constant). Dihedral 3° from roots.

## 4 ARGENTINE REPUBLIC: AIRCRAFT—AVEX / CICARÉ

### DIMENSIONS, INTERNAL:

Cabin: Length 4 ft 7 in (1.40 m)  
Width (constant) 1 ft 10 in (0.56 m)

### AREAS:

Wings, gross 91.5 sq ft (8.50 m<sup>2</sup>)  
Ailerons (total) 12.27 sq ft (1.14 m<sup>2</sup>)  
Fin 3.98 sq ft (0.37 m<sup>2</sup>)  
Rudder 4.74 sq ft (0.44 m<sup>2</sup>)  
Tailplane 6.89 sq ft (0.64 m<sup>2</sup>)  
Elevators 7.53 sq ft (0.70 m<sup>2</sup>)

### WEIGHTS AND LOADINGS:

Weight empty 366 lb (166 kg)  
Max T-O weight 608 lb (276 kg)  
Max wing loading 6.6 lb/sq ft (32.0 kg/m<sup>2</sup>)  
Max power loading 15.43 lb/hp (7.0 kg/hp)

### PERFORMANCE (estimated, at max T-O weight):

Max level speed at 5,000 ft (1,500 m)  
75.5 knots (87 mph; 140 km/h)  
Max cruising speed at 5,000 ft (1,500 m)  
65 knots (75 mph; 120 km/h)  
Stalling speed 30.5 knots (35 mph; 56 km/h)  
Service ceiling 9,845 ft (3,000 m)  
Range with max fuel 194 nm (223 miles; 360 km)

### GHINASSI HELICOPTERS

Sr Sesto Ghinassi is a specialist in, and racer of, motorcycles. He built a small single-seat helicopter, using unapproved materials and a 30 hp

engine developed by himself. After being test-flown up to 3.3 ft (1 m) height, this helicopter (described and illustrated in the 1973-74 *Jane's*) was displayed at an Aeronautical Exhibition in October 1972.

This aircraft was later scrapped, but Sr Ghinassi currently has a new helicopter under construction, for which he is using aircraft quality materials. Completion of this was anticipated by the end of 1974.

**ROTOR SYSTEM AND DRIVE:** Variable-pitch main and tail rotors, the former driven by chain drive from engine. Symmetrical-section blades, with 7% thickness/chord ratio, of wooden construction with aluminium skin. Max rpm of main rotor 400.

**FUSELAGE:** Welded steel tube structure.

**POWER PLANT:** One 30 hp 470 cc two-cylinder four-stroke turbine-cooled engine of own design; max rpm 6,300. Fuel tank capacity 4.4 Imp gallons (20 litres).

**ACCOMMODATION:** Single seat.

### DIMENSIONS, EXTERNAL:

Main rotor diameter 19 ft 8½ in (6.00 m)  
Tail rotor diameter 1 ft 11½ in (0.60 m)  
Main rotor blade chord 8½ in (0.22 m)  
Fuselage length 13 ft 1¼ in (4.00 m)  
Fuselage width 3 ft 3¼ in (1.00 m)  
Height overall 5 ft 1 in (1.55 m)

### PERFORMANCE (estimated):

Range 162 nm (186 miles; 300 km)

### YAKSTAS RACER

Originally begun by Prof Adolfo Yakstas as a much-modified development of the Baserga H.B.1 (see 1970-71 *Jane's*), this has now evolved into virtually a new design having only the two-cylinder Praga engine in common with its predecessor.

Work was halted in the Spring of 1973, but was restarted in the Spring of 1974. At this time the fuselage and tail unit were virtually complete, and rapid progress was being made in completing the wings.

**TYPE:** Single-seat racing monoplane.

**FUSELAGE:** Aluminium-skinned steel-tube forward section. Rear section, aft of main landing gear legs, is of wooden construction with fabric-covered upper and plywood-covered lower surfaces.

**TAIL UNIT:** Fabric-covered steel-tube structure, without sweepback.

**LANDING GEAR:** Non-retractable tailwheel type.

Spring steel main gear legs.

**POWER PLANT:** One 45 hp Praga B-2 two-cylinder engine, driving a two-blade fixed-pitch propeller with spinner.

**ACCOMMODATION:** Single seat under two-piece moulded Plexiglas canopy.

## CATA COMPAÑIA ARGENTINA DE TRABAJOS AÉREOS

### ADDRESS:

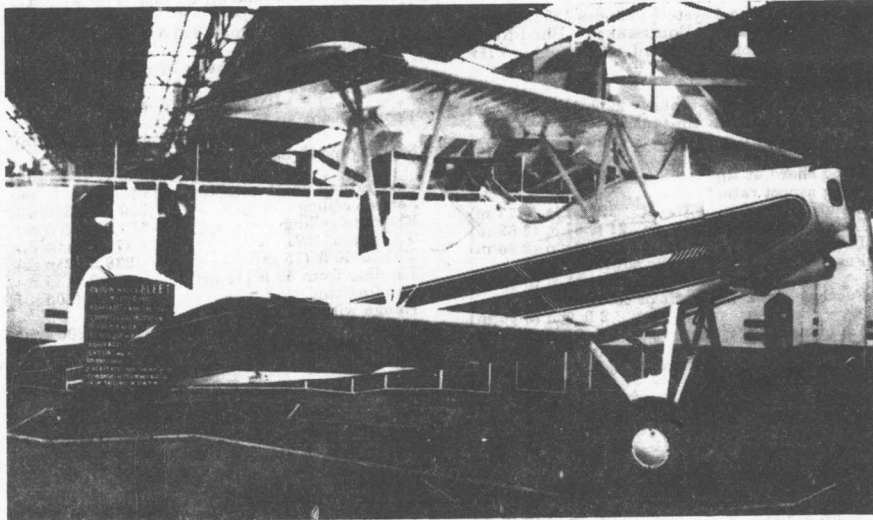
San Justo Aerodrome, Ruta 3, Km 24-7,  
Casanova (Buenos Aires), Aerodromo Aero-  
club Argentino

### CATA (FLEET) 150

This company has modified a Fleet biplane (LV-ZBZ) by installing a 150 hp Lycoming O-320 "flat-four" engine, with which the aircraft is known as the CATA (Fleet) 150. The aircraft used for the prototype conversion is a Fleet Model 5 or Model 7, and flew for the first time in its new form on 3 June 1971. A second aircraft, exhibited at Buenos Aires in late 1972, was converted from a Fleet Model 10.

The Canadian Fleet Company sold 20 Model 5 biplanes to Argentina in the 1930s, of which the majority are now believed to have been brought up to Model 10 standard with 125 hp Kinner B-5 radial piston engines. It is believed that, following successful trials with the prototype aircraft, these also are to be converted to CATA (Fleet) 150s, for use as glider-towing aircraft with Argentine flying clubs.

Second CATA-converted Fleet 150 biplane, on display in Buenos Aires (Alex Reinhard)



## CHINCUL CHINGUL S.A.C.A.I.F.I.

### HEAD OFFICE:

Mendoza S/N, Calle 6 y 7, Departamento Pocito,  
Casilla Correo 80, San Juan (San Juan)

### WORKS:

25 de Mayo 489, 60 Piso, Buenos Aires

### PRESIDENT:

José María Beraza

### VICE-PRESIDENT:

Juan José Beraza

### DIRECTOR:

Aquiles Luis Uriarte

### SUB-DIRECTORS:

Carlos Arriaga

Silvano Martín

### TREASURER:

José María Nunez

### SUB-TREASURER:

Julio Carranza Torres

This company, a wholly-owned subsidiary of La Macarena SRL, Piper's Argentine distributor, concluded an agreement with Piper Aircraft Corporation on 22 November 1971, for manufacture of a broad range of Piper products in Argentina. The proposed plan calls for a progression through five manufacturing phases of increasing complexity, designed to permit the gradual assimilation of aircraft manufacturing technology by Chincul.

The programme, officially inaugurated on 20

December 1972, schedules the completion of 1,000 single-engined and 340 twin-engined Piper aircraft by Chincul. Phase 1, following the delivery of four Seneca and 15 Cherokee kits, was carried out in 1973. Under a programme sponsored by the Comando de Regiones Aéreas, 40 Cherokees were to be built during the first two to three years for use as trainers by Argentine flying clubs.

A new assembly facility in San Juan was inaugurated on 13 December 1972. This facility, occupying a covered area of 30,623 sq ft (2,845 m<sup>2</sup>), is part of a 129,165 sq ft (12,000 m<sup>2</sup>) plant which will eventually be devoted to the assembly of all models of Piper aircraft. Finished aircraft will be test-flown and certificated by Argentine personnel.

## CICARÉ CICARÉ AERONÁUTICA SC

### ADDRESS:

Ave Ibañez Frocham s/n, CC24, Saladillo,  
Provincia de Buenos Aires

### ENQUIRIES TO:

Comodoro Antonio R. Mantel, Santa Fé 1256,  
Buenos Aires

Telephone: Buenos Aires 41-5260

### PARTNERS:

Augusto Ulderico Cicaré  
Comodoro Ildefonso Domingo Durana  
Comodoro Antonio Raúl Mantel

This company was formed in 1972 to undertake the development and construction of small aero-engines and light helicopters. Sr Cicaré, originally an engine designer, has designed and constructed two experimental helicopters, the Cicaré I and Cicaré II, brief details of which appeared in the 1970-71 and 1973-74 *Jane's*. A description follows of the more recently-designed CH-III Colibrí.

### CICARÉ CH-II

The Cicaré CH-II one/three-seat experimental lightweight helicopter was built primarily to test a specially-designed rotor system which can be operated as either a rigid or semi-rigid rotor. The prototype was flown for the first time on



Cicaré CH-II one/three-seat experimental helicopter (180 hp Lycoming O-360-A1A engine)

18 May 1965. It has a free-wheel system for autorotation, but is otherwise as described in the 1973-74 *Jane's*.

### CICARÉ CH-III COLIBRÍ

Design of the CH-III began in August 1973, and a prototype was under construction in 1974. This work is being done, under contract from the Argentine Air Force, to evolve a light helicopter

suitable for training and agricultural duties. First flight is scheduled to take place in 1975.

**TYPE:** Two/three-seat experimental light helicopter.

**ROTOR SYSTEM:** Four-blade rigid main rotor and two-blade tail rotor. Blade section NACA 0015. All blades are of glassfibre construction. No rotor brake or blade folding.



**ROTOR DRIVE:** Ten Vee-belts, via a reduction gearbox, with free-wheel system for autorotation. Main rotor/engine rpm ratio 1:6; tail rotor/engine rpm ratio 1:1.

**FUSELAGE:** Steel-tube structure, with Aerofibra glassfibre cabin and aluminium tailboom.

**TAIL UNIT:** Glassfibre horizontal and vertical fixed stabilisers.

**LANDING GEAR:** Tubular steel skid type.

**POWER PLANT:** One 190 hp Lycoming H10-360-D1A four-cylinder horizontally-opposed air-cooled engine, mounted horizontally. Single glassfibre fuel tank, capacity 29.5 Imp gallons (135 litres). Optional auxiliary tank, capacity 16.5 Imp gallons (75 litres).

**ACCOMMODATION:** Two or three seats side by side in enclosed cabin (instructor and pupil only in training version). Door on each side of cabin. Space for up to 100 lb (45 kg) of baggage. Cabin heated and ventilated.

**ELECTRONICS AND EQUIPMENT:** VHF radio standard. Mission equipment includes spraying or dusting gear and cargo sling.

**DIMENSIONS, EXTERNAL:**

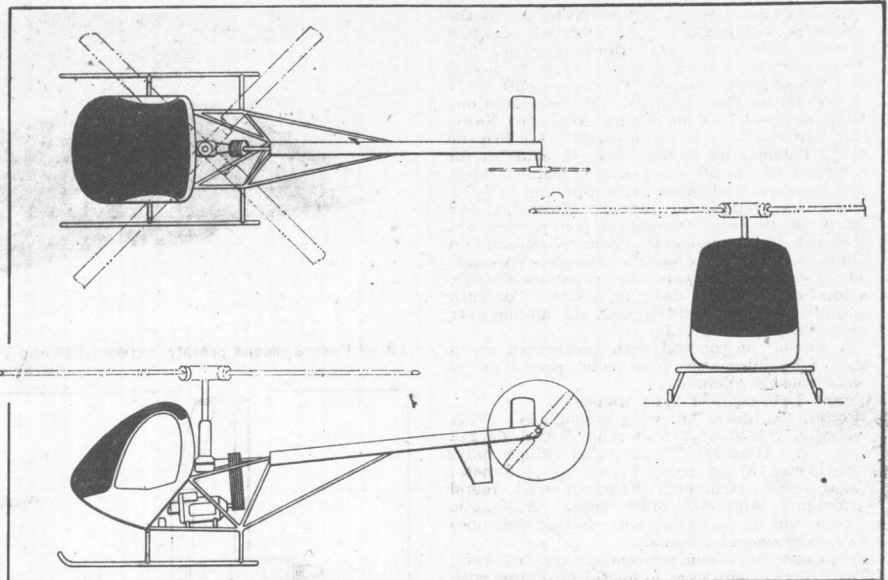
Diameter of main rotor	24 ft 6 in (7.47 m)
Main rotor blade chord	6 in (152 mm)
Diameter of tail rotor	3 ft 7.2 in (1.10 m)
Distance between rotor centres	
14 ft 0 in (4.27 m)	
Length overall	28 ft 0 in (8.53 m)
Height overall	8 ft 1.2 in (2.47 m)
Skid track	6 ft 7.2 in (2.01 m)

**AREAS:**

Main rotor disc	471.43 sq ft (43.8 m <sup>2</sup> )
Tail rotor disc	10.18 sq ft (0.95 m <sup>2</sup> )

**WEIGHTS AND LOADINGS:**

Weight empty, equipped	1,034 lb (469 kg)
Max payload	500 lb (226 kg)
Max T-O weight	1,764 lb (800 kg)
Max disc loading	3.74 lb/sq ft (18.3 kg/m <sup>2</sup> )
Max power loading	9.28 lb/hp (4.21 kg/hp)



Cicaré CH-III Colibri two/three-seat experimental light helicopter (Roy J. Grainger)

**PERFORMANCE (estimated, at max T-O weight):**

Max rate of climb at S/L	1,181 ft (360 m)/min
Service ceiling	12,800 ft (3,900 m)
Hovering ceiling out of ground effect	5,575 ft (1,700 m)
Range with internal fuel	259 nm (298 miles; 480 km)

**Max level and cruising speed at S/L**  
88 knots (101 mph; 163 km/h)

**Econ cruising speed**  
65 knots (74.5 mph; 120 km/h)

## FMA (AREA DE MATERIAL CORDOBA)

### AGRUPACION AVIONES-DEPARTAMENTO INGENIERIA, GUARNICION AEREA CORDOBA

**ADDRESS:**  
Avenida Fuerza Aérea Argentina Km 5 1/2, Córdoba

**Telephone:** 99184, 5640 and 98876

**DIRECTOR:**

Brigadier Enrique Zappino

**CHIEF DESIGNER AND ENGINEER:**

Vicecomodoro Héctor Eduardo Ruiz

The original Fábrica Militar de Aviones (Military Aircraft Factory) was founded in 1927 as a central organisation for aeronautical research and production in the Argentine. Its name was changed to Instituto Aerotécnico in 1943 and then to Industrias Aeronáuticas y Mecánicas del Estado (IAME) in 1952. In 1957 it became a State enterprise under the title of Dirección Nacional de Fabricaciones e Investigaciones Aeronáuticas (DINFIA), but reverted to its original title in 1968. It is now a component of the Area de Material Córdoba division of the Argentine Air Force.

FMA comprises two large divisions. The Instituto de Investigaciones Aeronáuticas y Espacial (IIAE) is responsible for the design, manufacture and testing of rockets, sounding equipment and other equipment. The Fábrica Militar de Aviones itself controls the aircraft manufacturing facilities situated in Córdoba City. (Manufacture of motor vehicles in quantity by the FMA ended in 1967.) The laboratories, factories and other buildings belonging to the aeronautical divisions of FMA occupy a total covered area of 1,599,059 sq ft (148,557 m<sup>2</sup>); the Area de Material Córdoba employs 3,500 persons, of whom about 1,500 are in the FMA.

FMA's head offices are situated in Buenos Aires City. It also controls the Centro de Ensayos en Vuelo (Flight Test Centre), to which all aircraft produced in the Argentine are sent for certification tests.

The major aircraft of national design in current production are the twin-turboprop general-purpose IA 50 GII (formerly Guarani II) and the IA 58 Pucará counter-insurgency aircraft.

FMA is also producing Cessna single-engined aircraft under licence, under a renewed and extended form of the agreement announced in October 1965. First phase called for assembly of 80 aircraft from major assemblies supplied by Cessna. Phase 2 involved assembly of 100 aircraft from detail parts provided by Cessna. Phase 3 involves an estimated 320 aircraft, for which FMA is manufacturing or acquiring in the Argentine as many parts as possible. All aircraft are repurchased by Cessna for sale through its distributors and dealers in Latin America or sold directly by FMA to Argentine government agencies. Forty Cessna Model 150s have been ordered by the Comando de Regiones Aéreas for use as trainers by Argentine flying clubs.

The first A182J (Argentine 182) was completed

in August 1966 from the initial batch of twelve sets of components supplied by Cessna, and was delivered to its owner on 2 September 1966. The renewed and extended agreement, announced in April 1971, provided for continued production of the Cessna 182 and, in addition, for the range to be extended to include the Model 150 trainer and the AGwagon agricultural aircraft.

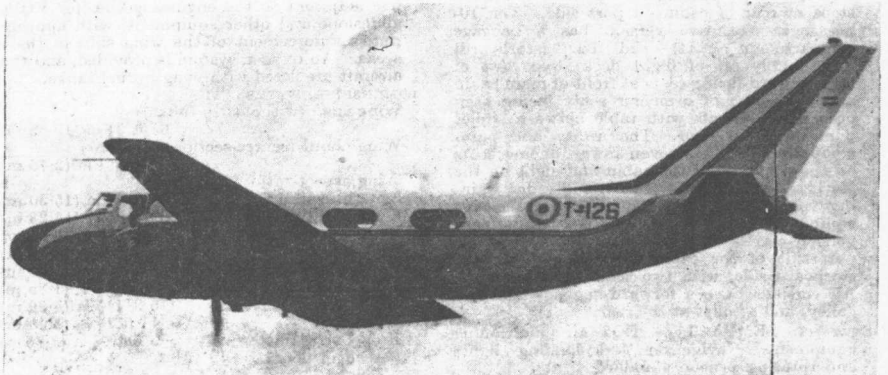
By February 1974, FMA had completed 136 Cessna Model A182s, 16 Model A150 trainers, six Model A-A150 Aerobats and 16 AGwagons.

### IA 50 GII

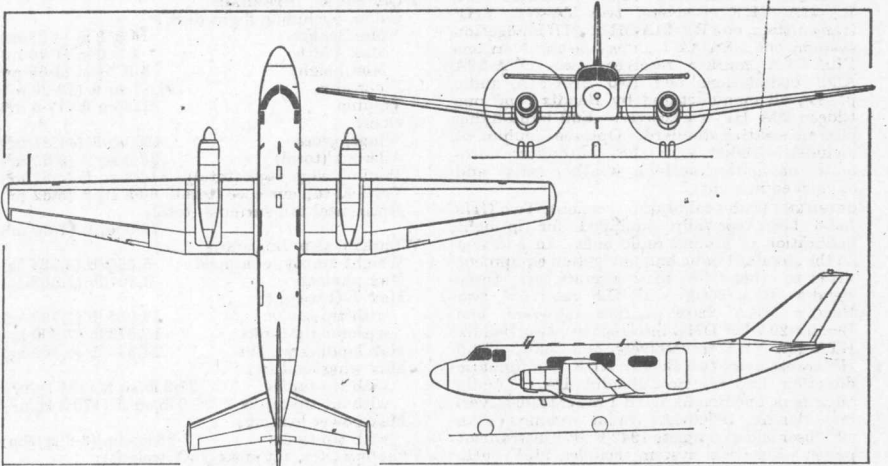
The original FA1 Guarani I twin-turboprop light transport was described in the 1962-63 *Jane's*.

From it was developed the IA 50 (formerly FA2) Guarani II, the first prototype of which (LV-X27) flew for the first time on 23 April 1963 and introduced more powerful engines, de-icing equipment, a single swept fin and rudder and a shorter rear fuselage. A second prototype (TX-01) was built, followed by a single pre-production aircraft. Production aircraft have flight deck windows of modified size and shape, to meet the US Federal Aviation Agency's CAM4B requirements, and provision for wingtip auxiliary fuel tanks.

The GII, as it is now known, is in production for the Argentine Air Force (FAA). Initial orders were for 18 standard models for communications duties, four for photographic operations with the Military Geographic Institute and one



FMA IA 50 GII twin-turboprop multi-purpose aircraft of the Argentine Air Force



IA 50 GII twin-turboprop light transport (Pilot Press)

furnished as an executive transport for use by the President of Argentina. The first 18 production aircraft include one VIP transport (serial TX-110), fourteen troop transports (T-111 to T-124) and two photographic and survey aircraft (F-31 and F-32) for the Argentine Air Force; and one staff transport (5-T-30) for the Argentine Navy. The first two were in service with I Air Brigade at El Palomar by March 1967. A contract for a further 15 aircraft was placed in October 1969, and production of these was continuing in 1974. They have redesigned internal furnishings, and many of the steel structural components are replaced by components made of aluminium alloy, to reduce the aircraft's basic empty weight. Thus, with the prototypes and pre-series aircraft, a total of 41 GIIs is being produced. The 19th aircraft (T-125) was fitted with ski landing gear for use in the Antarctic.

A version of the GII with pressurised cabin and fully-automatic four-blade propellers is under consideration.

**TYPE:** Twin-engined light transport.

**WINGS:** Cantilever low-wing monoplane. Wing section NACA 63,218 at root, NACA 63,212 at tip. Dihedral 7° on outer wings only. Incidence 3° at root, 1° at tip. All-metal single-spar structure. Fabric-covered metal ailerons. All-metal split flaps. Automatic trim tab in each aileron. Kléber-Colombes de-icing system optional.

**FUSelage:** Duralumin semi-monocoque structure.

**TAIL UNIT:** Cantilever all-metal structure with 52° 40' sweepback on fin leading-edge and 21° 50' on tailplane leading-edge. Variable-incidence sweptback tailplane, with streamline tip fairings. Trim tab in rudder and each elevator. Kléber-Colombes leading-edge de-icing system optional.

**LANDING GEAR:** Retractable tricycle type.

Hydraulic actuation, all wheels retracting forward. Oleo-pneumatic shock-absorbers of Argentine manufacture. Each main unit fitted with two Dunlop wheels and tubeless tyres size 750 x 10. Single Dunlop nosewheel with tubeless tyre size 650 x 10. Tyre pressure 45 lb/sq in (3.16 kg/cm<sup>2</sup>). Dunlop hydraulic brakes.

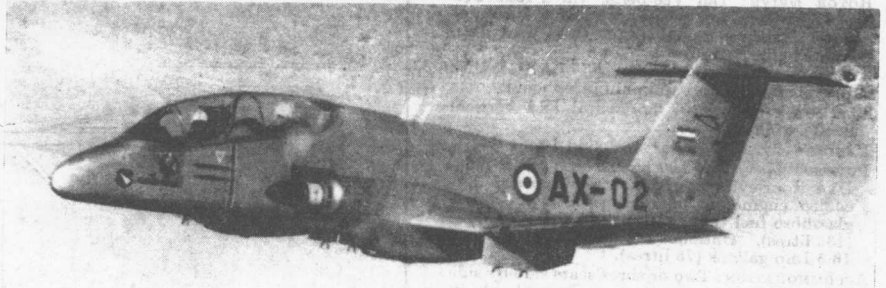
**POWER PLANT:** Two Turboméca Bastan VIA turboprop engines, each rated at 930 shp plus 165 lb (75 kg) st. Ratier-Figeac FH86 three-blade variable-pitch metal propellers. Water-alcohol injection. Total internal fuel capacity 420 Imp gallons (1,910 litres) in integral tanks in wings. Provision for two wingtip fuel-tanks, each with capacity of 77 Imp gallons (350 litres). Oil capacity 4.2 Imp gallons (19 litres) for each engine.

**ACCOMMODATION:** Crew of two side by side on flight deck. Standard seating in main cabin for 10, 12 or 15 passengers. Door with built-in steps at rear of cabin on port side. The 10-passenger executive version has a baggage compartment (port) and bar (starboard) immediately aft of flight deck; two rows of three inward-facing seats at front of main cabin and two pairs of armchair seats facing each other fore and aft with table between; toilet opposite cabin door. The utility and paratroop transport has seven inward-facing seats on the port side of the cabin and eight on the starboard side. A navigation and radar training version has six seats and comprehensive equipment in the cabin. An ambulance version carries two pairs of stretchers on the port side of the cabin and one pair on the starboard side, with two seats for attendants. All versions have a forward baggage hold and galley, and a toilet at the rear.

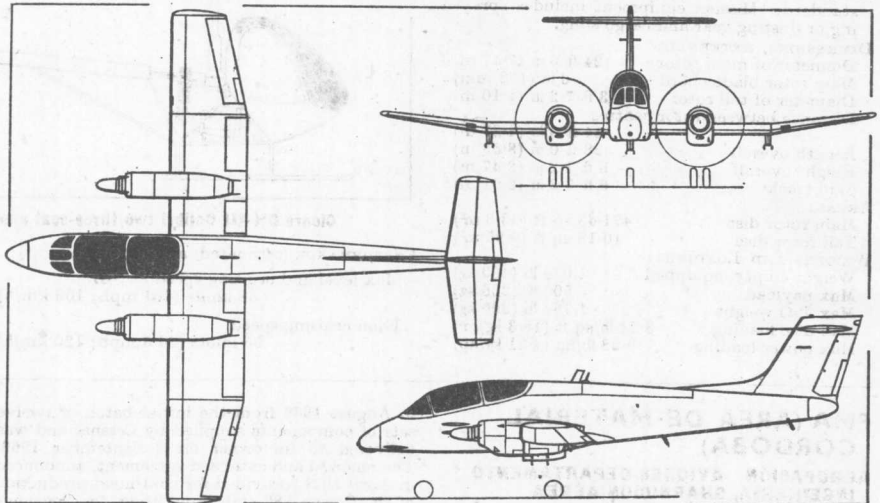
**SYSTEMS:** SEMCA Type EQ2 air-conditioning equipment. Navigation and landing lights and rotating beacon standard.

**ELECTRONICS AND EQUIPMENT:** Radio and radar according to military role. Normally two RA-21A VHF receivers, two TA-21A VHF transmitters, one RA-21A-MNA-21B navigation system, one GSA-8A-1 glideslope receiver, one FKA-23-A marker receiver, two DFA-22A ADF installations and two ASA-31A audio panels, all manufactured by Bendix; and one Eldeco 20A HF transceiver. Full blind-flying instrumentation standard. Optional equipment includes Bendix VOR/ILS, autopilot, automatic navigation system, weather radar and oxygen equipment.

**EQUIPMENT (radio calibration version):** Two GIIs have been specially equipped for in-flight calibration of ground radio aids. In addition to the standard radio and navigation equipment fitted to other GIIs, these aircraft carry three Bendix RNA 26CF VOR/ILS receivers, two Bendix MKA 28CF marker receivers, two Bendix 29 ACF DME interrogator, two Bendix RTA-42A VHF transceivers, one Collins 718-5 HF transceiver, two Bendix ADF 73 automatic direction finders, two Bendix LA-17 audio amplifiers, one Bendix RDR 1 radar transceiver, one Bendix 18900-1A1 radar antenna gyro stabiliser and a complete 1942 EGGET instrument panel. Electrical system includes 115V 50Hz AC supply and 27V DC stabilising supply. Much of the additional equipment listed is



IA 58 Pucará second prototype (two 1,022 ehp Turboméca Astazou XVIG turboprops), showing under-wing stores pylons



FMA IA 58 Pucará twin-turboprop counter-insurgency aircraft (Pilot Press)

installed in the nose; the remainder is installed in a special console aft of the flight deck. To the rear of this console, in the main cabin, are individual seats for five equipment operators, together with an oscilloscope, radio rack, frequency counter, digital voltmeter, baggage compartment, two workbenches and a reference library. There are various underwing antennae, adjacent to the engine nacelles, for VOR, glideslope and other equipment, with appropriate reinforcement of the wing skin in these areas. An oxygen system is provided, and the aircraft are fitted with wingtip fuel tanks.

**DIMENSIONS, EXTERNAL:**

Wing span (without tip-tanks)	64 ft 3½ in (19.59 m)
Wing chord (centre-section, constant)	9 ft 1 in (2.75 m)
Wing aspect ratio	9
Length overall	50 ft 2¼ in (15.30 m)
Length of fuselage	46 ft 10¼ in (14.28 m)
Height over tail	18 ft 5 in (5.61 m)
Tailplane span	21 ft 4 in (6.50 m)
Fuselage: Max width	5 ft 3 in (1.60 m)
Max depth	6 ft 1½ in (1.86 m)
Wheel track	15 ft 1½ in (4.86 m)
Wheelbase	11 ft 1½ in (3.40 m)
Propeller diameter	9 ft 0¼ in (2.75 m)
Passenger door:	
Height	4 ft 9½ in (1.46 m)
Width	2 ft 5 in (0.74 m)

**DIMENSIONS, INTERNAL:**

Cabin, excluding flight deck:	
Max length	16 ft 2 in (4.93 m)
Max width	4 ft 9 in (1.45 m)
Max height	5 ft 5½ in (1.66 m)
Floor area	131.3 sq ft (12.20 m <sup>2</sup> )
Volume	618 cu ft (17.5 m <sup>3</sup> )
<b>AREAS:</b>	
Wings, gross	450 sq ft (41.81 m <sup>2</sup> )
Ailerons (total)	38.2 sq ft (3.55 m <sup>2</sup> )
Trailing-edge flaps (total)	51.73 sq ft (4.81 m <sup>2</sup> )
Vertical tail surfaces (total)	60.5 sq ft (5.62 m <sup>2</sup> )
Horizontal tail surfaces (total)	79.0 sq ft (7.34 m <sup>2</sup> )

**WEIGHTS AND LOADINGS:**

Weight empty, equipped	8,650 lb (3,924 kg)
Max payload	3,307 lb (1,500 kg)
Max T-O weight:	
with tip-tanks	17,085 lb (7,750 kg)
without tip-tanks	15,873 lb (7,200 kg)
Max landing weight	14,330 lb (6,500 kg)
Max wing loading:	
with tip-tanks	37.9 lb/sq ft (185 kg/m <sup>2</sup> )
without tip-tanks	35.0 lb/sq ft (170.9 kg/m <sup>2</sup> )
Max power loading:	
with tip-tanks	8.38 lb/ehp (3.8 kg/ehp)

**PERFORMANCE (at max T-O weight):**

Max never-exceed speed	277 knots (320 mph; 515 km/h)
------------------------	-------------------------------

Max level speed	269 knots (310 mph; 500 km/h)
Max cruising speed	265 knots (305 mph; 491 km/h)
Econ cruising speed	
243 knots (280 mph; 450 km/h)	
Stalling speed	79 knots (90 mph; 145 km/h)
Max rate of climb at S/L	2,640 ft (805 m)/min
Service ceiling	41,000 ft (12,500 m)
Service ceiling, one engine out	11,000 ft (3,350 m)
T-O run	1,380 ft (420 m)
T-O to 50 ft (15 m)	2,200 ft (640 m)
Landing from 50 ft (15 m)	1,970 ft (600 m)
Landing run	820 ft (250 m)
Range with max fuel	1,389 nm (1,600 miles; 2,575 km)
Range with max payload	1,076 nm (1,240 miles; 1,995 km)

**IA 58 PUCARÁ**

This twin-turboprop COIN (counter-insurgency) combat aircraft was developed to meet an Argentine Air Force requirement. Originally known as the Delfín, it was later renamed Pucará. An unpowered aerodynamic prototype, with dummy engine nacelles and fixed landing gear, was first flown on 26 December 1967, and was described in the 1968-69 *Jane's*.

Detailed design work on the powered version was begun in February 1968. Construction of the first powered prototype, designated AX-01, started in September 1968, and this aircraft flew for the first time on 20 August 1969, powered by AiResearch TPE 331 engines. It was described in the 1971-72 *Jane's*.

A second prototype, designated AX-02, flew for the first time on 6 September 1970 with 1,022 ehp Turboméca Astazou XVIG turboprop engines, and the production version is powered by engines of this type. Five pre-series aircraft are being built, and work has also started on an initial production series of 100 aircraft. An order for 30 Pucarás has been placed by the Argentine Air Force, with deliveries scheduled to begin in 1974. It is anticipated that this order will later be increased to 70 aircraft. Interest in the Pucará has also been expressed by the Peruvian Air Force.

The following description applies to the production version:

**TYPE:** Twin-turboprop counter-insurgency aircraft.

**WINGS:** Cantilever low-wing monoplane. Wing section NACA 64, A215 at root, NACA 64, A212 at tip. Dihedral 7° on outer wing panels. Incidence 2°. No sweepback. Conventional semi-monocoque fail-safe structure of duralumin. Frise-type fabric-covered duralumin ailerons and all-dural slotted trailing-edge

flaps. No slats. Balance tab in starboard aileron, electrically-operated trim tab in port aileron. Kléber-Colombes pneumatic de-icing boots on leading-edges.

**FUSELAGE:** Conventional semi-monocoque fail-safe structure of duralumin. Door-type airbrakes at rear which form tailcone when closed.

**TAIL UNIT:** Cantilever semi-monocoque structure of duralumin. Fixed-incidence tailplane and elevators mounted near top of fin. Trim tab in rudder and each elevator. Kléber-Colombes pneumatic de-icing boots on leading-edges.

**LANDING GEAR:** Retractable tricycle type, all units retracting forward hydraulically. Shock-absorbers of Kronprinz Ring-Feder type, designed by Vicecomodoro Ruiz. Single wheel on nose unit, twin wheels on main units, all with Dunlop tubeless Type III tyres size 7-80-10. Tyre pressures: 41 lb/sq in (2.88 kg/cm<sup>2</sup>) on main units, 35 lb/sq in (2.46 kg/cm<sup>2</sup>) on nose unit. Dunlop hydraulic disc brakes. No anti-skid units.

**POWER PLANT:** Two 1,032 shp Turboméca Astazon XVIG turboprop engines, each driving a Hamilton Standard 33LF/1018-0 three-blade metal propeller. Fuel in two fuselage tanks and one self-sealing tank in each wing, with total capacity of 313 Imp gallons (1,422 litres). Attachment point beneath each wing at junction of centre and outer panels for external weapons or jettisonable auxiliary fuel tank of 66 Imp gallons (300 litres). Oil capacity 2.6 Imp gallons (11.75 litres).

**ACCOMMODATION:** Crew of two in tandem on Martin-Baker Mk AP06A ejection seats beneath transparent moulded canopy. Rear seat slightly elevated. Bullet-proof windscreen.

**SYSTEMS:** Hydraulic system, pressure 3,000 lb/sq in (210 kg/cm<sup>2</sup>), supplied by two engine-driven pumps, actuates landing gear, flaps, wheel brakes and airbrakes. Wing and tail unit de-icing by bleed air from engines. Electrical system includes two 300A 28V starter/generators for DC power and two 500-750VA rotary inverters for 115V AC power. One 36Ah SAFT Voltaloc 4006 battery. No APU at present.

**ELECTRONICS AND EQUIPMENT:** Blind-flying instrumentation standard. Radio equipment includes Bendix DFA-73A-1 ADF, Bendix RTA-42A VHF communications system, Bendix RNA-2bc VHF navigation system, Northern N-420 HF 55B communications system, amplifier and audio-selector system with AS-A-31 panel. Optional equipment includes weather radar, IFF and VHF/FM tactical communications system.

**ARMAMENT AND OPERATIONAL EQUIPMENT:** Two 20 mm Hispano cannon and four 7.62 mm FN machine-guns in fuselage. One attachment point beneath centre of fuselage and one beneath each wing outboard of engine nacelle for a variety of external stores, including auxiliary fuel tanks. Librascope 335336 gun-sight and one AN/AWE programmer.

**DIMENSIONS, EXTERNAL:**

Wing span	47 ft 6½ in (14.50 m)
Wing chord at root	7 ft 4½ in (2.24 m)
Wing chord at tip	5 ft 3 in (1.60 m)
Wing aspect ratio	6.96
Length overall	46 ft 3 in (14.10 m)
Length of fuselage	43 ft 8½ in (13.32 m)
Fuselage: Max width	4 ft 0½ in (1.24 m)
Height overall	17 ft 7 in (5.36 m)
Tailplane span	15 ft 5 in (4.70 m)
Wheel track (o/s of shock struts)	
Wheelbase	13 ft 9½ in (4.20 m)
Propeller diameter	11 ft 5 in (3.48 m)
Propeller diameter	8 ft 6 in (2.59 m)

**DIMENSIONS, INTERNAL:**

Cabin: Floor area	31.2 sq ft (2.90 m <sup>2</sup> )
Volume	96.8 cu ft (2.74 m <sup>3</sup> )

**AREAS:**

Wings, gross	326.1 sq ft (30.30 m <sup>2</sup> )
Ailerons (total)	35.41 sq ft (3.28 m <sup>2</sup> )
Trailing-edge flaps (total)	38.53 sq ft (3.58 m <sup>2</sup> )
Fin	37.30 sq ft (3.46 m <sup>2</sup> )
Rudder, including tab	16.84 sq ft (1.56 m <sup>2</sup> )
Tailplane	49.51 sq ft (4.60 m <sup>2</sup> )
Elevators, including tab	28.11 sq ft (2.61 m <sup>2</sup> )

**WEIGHTS AND LOADINGS:**

Weight empty	8,900 lb (4,037 kg)
Max T-O weight	14,300 lb (6,486 kg)
Max landing weight	12,800 lb (5,806 kg)
Max wing loading	44 lb/sq ft (214.8 kg/m <sup>2</sup> )
Max power loading	7 lb/shp (3.18 kg/shp)

**PERFORMANCE (at max T-O weight, except where indicated):**

Max never-exceed speed	404 knots (466 mph; 750 km/h)
Max level speed at 9,840 ft (3,000 m)	281 knots (323 mph; 520 km/h)

**Max cruising speed**

261 knots (301 mph; 485 km/h)	
<b>Econ cruising speed</b>	232 knots (267 mph; 430 km/h)
<b>Stalling speed, flaps down, at 10,560 lb (4,790 kg) AUV</b>	77.5 knots (89 mph; 142.5 km/h)
<b>Max rate of climb at 8/L 3,543 ft (1,080 m)/min</b>	
<b>Service ceiling at 13,668 lb (6,200 kg) AUV, 0° flap</b>	27,165 ft (8,280 m)
<b>Service ceiling, one engine out, at 10,934 lb (4,960 kg) AUV, 0° flap</b>	17,533 ft (5,344 m)
<b>T-O run</b>	985 ft (300 m)
<b>T-O to 50 ft (15 m)</b>	2,313 ft (705 m)
<b>Landing from 50 ft (15 m), at 11,243 lb (5,100 kg) AUV</b>	1,978 ft (603 m)
<b>Landing run at 11,243 lb (5,100 kg) AUV</b>	656 ft (200 m)
<b>Range with max fuel at 16,400 ft (5,000 m)</b>	1,641 nm (1,890 miles; 3,042 km)

**FMA TWIN-ENGINED TRAINER**

Based on the airframe of the Pucará, Vicecomodoro Ruiz has designed a tandem two-seat training aircraft, to be powered by two Turboméca Astafan turbofan engines. As shown in the accompanying three-view drawing, these engines will be mounted in pods on the fuselage sides above the wing, with streamlined landing gear fairings replacing the turboprop engine nacelles of the standard Pucará. The following details are provisional:

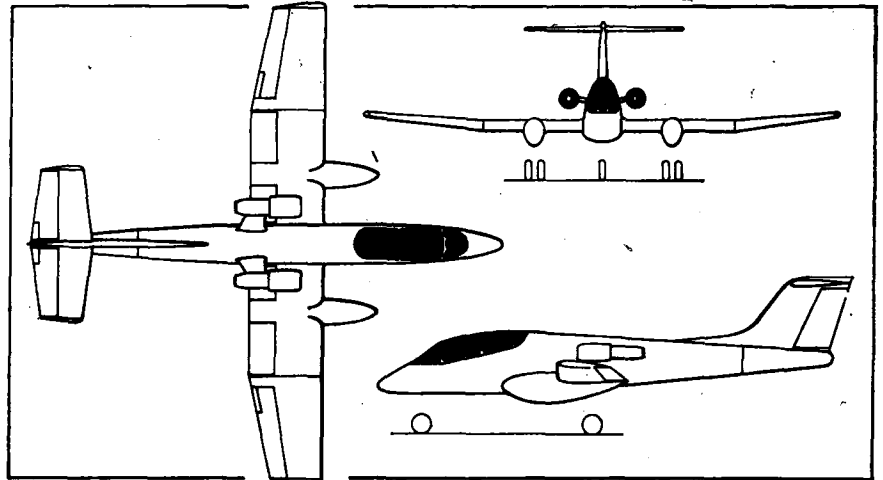
**DIMENSIONS, EXTERNAL:** As IA 58 Pucará

**WEIGHTS:**

Weight empty, equipped	8,377 lb (3,800 kg)
Max T-O weight	14,330 lb (6,500 kg)

**PERFORMANCE:**

Max critical Mach number	0.73
Service ceiling	32,800 ft (10,000 m)



FMA tandem two-seat training aircraft (two Turboméca Astafan turbofan engines) (Boy J. Grainge)

**RACA**

REPRESENTACIONES AERO COMERCIALES ARGENTINAS SA

**HEAD OFFICE:**

Lavalle 715, 5° Piso, Buenos Aires  
Telephone: 392-1334 and 392-9488  
Telegrams: RACAVIA  
Telex: 012-2844

**WORKS:**

Aerodromo San Fernando, Provincia Buenos Aires

**RRASA**

RONHETTI RAZZETTI AVIACION SA

ADDRESS: Aeropuerto Internacional Rosario CC7, Funes, Santa Fé  
Telephone: Funes 93276

**DIRECTOR:**

J. R. Fernandez Racca

**VICE-PRESIDENT:**

Luis Alberto Varisco

This company is the representative or dealer in Argentina for a number of world aerospace companies, and is the exclusive national distributor for the Concorde, BAC One-Eleven, Shorts Skyvan Srs 3, Canadair CL-215 and HFB 320 Hansa aircraft, and the MBB BO 105 and Hughes helicopters. Under a licence agreement concluded in December 1972 RACA is undertaking, with Argentine government approval (granted in mid-1973), the progressive local manufacture of Hughes Model 500 helicopters from knock-down

components. These are known locally as RACA-Hughes 500s.

The total programme involves 120 helicopters of this type over the next eight years, for military and civil customers in Argentina and neighbouring countries. In anticipation of this programme, RACA expanded its workshop facilities at San Fernando aerodrome to a covered area of 49,514 sq ft (4,600 m<sup>2</sup>).

By February 1974, 25 RACA-Hughes 500s had been ordered, including six for the Prefectura Naval Argentina (National Coast Guard) and two each for the government of Santa Fé province and Yacimientos Petroliferos Fiscales; of these, five had been completed.

**DIRECTOR:** Julio E. Razzetti

**DIRECTOR IN CHARGE OF AVIATION DIVISION:**

Ing Emilio P. Illecas

**RRASA J-1 MARTIN FIERRO**

This aircraft, a prototype of which was nearing completion in the Spring of 1974, is a single-seat

agricultural aircraft. It is of low-wing mono-plane configuration, has a non-retractable tail-wheel landing gear, and is powered by a 300 hp engine.

No other details were available at the time of closing for press.

**AUSTRALIA**

**CAC**

COMMONWEALTH AIRCRAFT CORPORATION PTY LTD

**HEAD OFFICE AND WORKS:**

304 Lorimer Street, Port Melbourne, Victoria 3207

Telephone: 64 0771

Telex: 30721

**DIRECTORS:**

Air Chief Marshal Sir Frederick Soherger, KBE, CB, DSO, AFC (Chairman)  
M. L. Baillieu

Sir Ian McLennan

L. C. Bridgland  
R. R. Law-Smith, CBE, AFC  
A. W. Stewart  
R. T. M. Rose

**GENERAL MANAGER:** R. L. Abbott

**SECRETARY:** E. W. Stodden

Commonwealth Aircraft Corporation Pty Ltd was formed in 1936 to establish an aircraft industry that would make Australia independent of outside supplies.

The Corporation has an authorized capital of \$6,000,000. Shareholders include BHP Nom-

inees Pty Ltd; North Broken Hill Ltd; B. H. South Ltd; Electrolytic Zinc Co of Australasia; Nobel (Australasia) Pty Ltd; Rolls-Royce (1971) Ltd; and P & O Australian Holdings Pty Ltd.

Under a co-production agreement between the Australian government and the Bell Helicopter Co of the USA, announced in February 1971, CAC is the prime contractor in an eight-year programme to provide 75 Bell OH-58A Kiowa helicopters for the Australian Army and 116 Bell JetRangers for the commercial market. The Australian Army received its first OH-58A in April 1973, and 20 OH-58As and 2 civil Jet-



Rangers had been delivered by mid-February 1974. Two Bell 206B-1s were delivered at about the same time to the Royal Australian Navy.

A constant overhaul programme for Atar engines used by the RAAF is maintained, together with an overhaul programme for Sabre aircraft and Avon engines operated by the air

forces of Malaysia and Indonesia.

Other contracts include a variety of offset work for Boeing, Sikorsky, SNECMA and Hawker Siddeley Aviation; and manufacture of components for the Government Aircraft Factories Nomad and New Zealand Aerospace Industries CT/4 Airtrainer (which see).

Rex Aviation Ltd, Bankstown Aerodrome, New South Wales, a wholly-owned subsidiary of CAC, is the distributor of Cessna aircraft and Hughes 300 and 500 helicopters in Australia and New Guinea.

Details of the company's aero-engine activities can be found in the "Aero-engines" section.

**CORBY**  
**JOHN CORBY**

ADDRESS:  
86 Eton Street, Sutherland, NSW 2232

Mr Corby, a consultant aero engineer, has designed and is marketing plans for a single-seat ultra-light homebuilt aircraft known as the Starlet. Several examples are flying and under construction.

**CORBY CJ-1 STARLET**

By early 1974 seven Starlets had been completed and a further 31 were under construction in Australia and New Zealand.

The first Starlet (VH-ULV) was built by Mr Erle Jones (Secretary and former President of the ULAA, Latrobe Valley Aero Club, PO Box 410, Morwell, Victoria 3840) and Mr John Brown. Compared with the standard Starlet, this has the seat bulkhead inclined rearward by 3 in (7.6 cm) at the top, and uses a solid spruce landing gear beam with an ash lamination, instead of multi-laminated end-grain spruce. In its original form, with a 42 hp (approx) engine, it had a max T-O weight of 650 lb (294 kg), a max level speed of 104 knots (120 mph; 193 km/h) and a range of 260 nm (300 miles; 482 km). Now fitted with a 49 hp Arden Mk XI engine, it averaged 100 knots (115 mph; 185 km/h) around a two-day 477 nm (550 mile; 885 km) cross-country course during the NSW air races in July 1973. Prior to this, with its original engine, it had gained second place in Grade B of the 1973 aerobatic open championships in Australia. Winner of those championships (Grade A), against the remainder of commercially-built entrants, was another Corby Starlet (VH-WDJ), fitted with a 49 hp Arden XI engine and flown by Peter Furlong of Morwell, Victoria.

The following description applies to the standard Corby Starlet, except where indicated:

**TYPE:** Single-seat ultra-light homebuilt aircraft.  
**WINGS:** Cantilever low-wing monoplane of wood-en construction. Wing section NACA 43012A. Dihedral 6°. Incidence 2° 30' at root, -1° at tip. Laminated main spar of solid spruce, sub-spar of spruce, built-up girder-type ribs and D-shaped nose section. Plywood covering from leading-edge to main spar, remainder fabric covered. Provision for dismantling into two equal halves. Ailerons, of spruce with birch plywood covering, deflect 15° up and down.  
**FUSELAGE:** Plywood-covered spruce structure.



Corby Starlet single-seat ultra-light aircraft for amateur construction

**TAIL UNIT:** Cantilever type, of similar construction to wings. Fixed-incidence tailplane. Plywood-covered fixed surfaces; fabric-covered rudder and elevators. Elevators deflect 30° up, 20° down; rudder deflects 25° to left and right.  
**LANDING GEAR:** Non-retractable two-wheel type standard. Separate spring steel leaf-type shock-absorbing main legs, attached directly to fuselage via a solid spruce/ash beam which also serves as the wing leading-edge attachment member. Wheels, tyres and brakes of customer's choice, subject to minimum main wheels of 3½ in (8.9 cm) diameter with 4.00-4 tyres and Olympic go-kart hubs. Sturmyer Archer cycle drum/shoe brakes may be used. Leaf-spring tailskid, or tailwheel at customer's option. Wheel fairings optional.  
**POWER PLANT:** Any suitable engine of up to 75 hp and 160 lb (72 kg) weight, driving a two-blade propeller. Fuel tank, capacity 8-10 Imp gallons (36-45 litres), aft of engine firewall. Oil capacity 5 lb (2.25 kg).  
**ACCOMMODATION:** Single seat. Sliding canopy optional. Baggage locker behind seat.  
**DIMENSIONS, EXTERNAL:**  
Wing span 18 ft 6 in (5.64 m)  
Wing chord at root 4 ft 4 in (1.32 m)  
Length overall 14 ft 9 in (4.50 m)  
Fuselage: Max width 1 ft 9½ in (0.55 m)  
Height overall 4 ft 10 in (1.47 m)  
Tailplane span 6 ft 6 in (1.98 m)

Wheel track	4 ft 6 in (1.37 m)
Propeller diameter:	
standard	4 ft 9 in (1.45 m)
prototype	4 ft 4 in (1.32 m)
Propeller ground clearance	10 in (25.5 cm)
<b>AREAS:</b>	
Wings, gross	68.50 sq ft (6.36 m²)
Horizontal tail surfaces (total)	13.75 sq ft (1.28 m²)
Vertical tail surfaces (total)	7.40 sq ft (0.69 m²)
<b>WEIGHTS:</b>	
Weight empty	405-420 lb (183-190 kg)
Max T-O weight (semi-aerobatic)	650 lb (295 kg)
<b>PERFORMANCE (prototype, with 49 hp engine, at 650 lb; 295 kg AEW):</b>	
Max never-exceed speed	138 knots (159 mph; 255 km/h) IAS
Max level speed	117 knots (135 mph; 217 km/h) TAS
Max cruising speed	107 knots (123 mph; 198 km/h) TAS
Stalling speed, power off:	
42 knots (49 mph; 79 km/h) TAS	
30 knots (35 mph; 57 km/h) IAS	
Typical rate of climb at S/L	700-850 ft (213-259 m)/min
Service ceiling	14,500 ft (4,420 m)
T-O to, and landing from, 50 ft (15 m)	1,000-1,100 ft (305-335 m)
g limits	±4.5

**GOVERNMENT OF AUSTRALIA**  
**DEPARTMENT OF SUPPLY**

ADDRESS:  
Anzac Park West Building, Constitution Avenue, Parkes, Canberra ACT 2600  
Telephone: 48 2111  
Telex: 62063

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DEPUTY SECRETARIES:  
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D. J. O'Connor, BCom, DipPubAd, AASA (Senior) (Management and Supply)

DIRECTOR OF PUBLIC RELATIONS:  
A. L. Witsenhuysen, BA  
Government Aircraft Factories  
HEADQUARTERS:  
Fishermen's Bend, Private Bag No. 4, Post Office, Port Melbourne, Victoria 3207  
Telephone: 64 0661

AIRFIELD AND FINAL ASSEMBLY WORKSHOPS:  
Avalon Airfield, Beach Road, Lara, Victoria 3212  
Telephone: Lara 82 1202  
MANAGER: G. J. Churcher, BEngSc, MIEAust

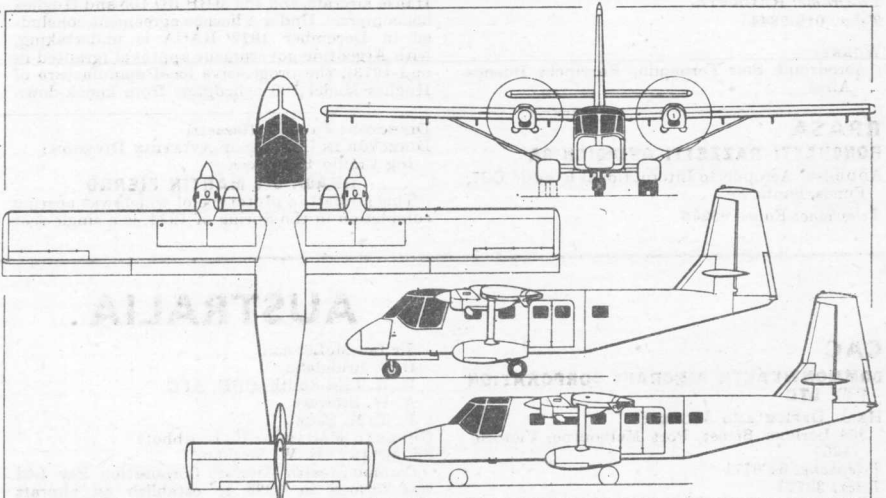
The Government Aircraft Factories are units of the Defence Production facilities owned by the Government of the Commonwealth of Australia and operated by the Department of Supply. Their functions include the design, development, manufacture, assembly, maintenance and modification of aircraft and guided weapons. At Avalon airfield, subassembly of components, final assembly, modification, repair and test-flying of jet and other aircraft are undertaken. The Factories' major recent activity was the production of Dassault Mirage III-O fighters and III-D operational trainers for the RAAF as prime contractor. Current activity includes development and production of the GAF Nomad twin-turboprop STOL transport. The Jindivik and Turana target drones are

described in the "RPVs and Targets" section of this edition. The GAF are producing rudders and elevators for the Boeing 727 under contract to The Boeing Company; and are subcontractors to Commonwealth Aircraft Corporation in manufacturing bonded structures (main and tail rotor blades and fuselage panels) for Australian-produced examples of the Bell JetRanger series of helicopters.

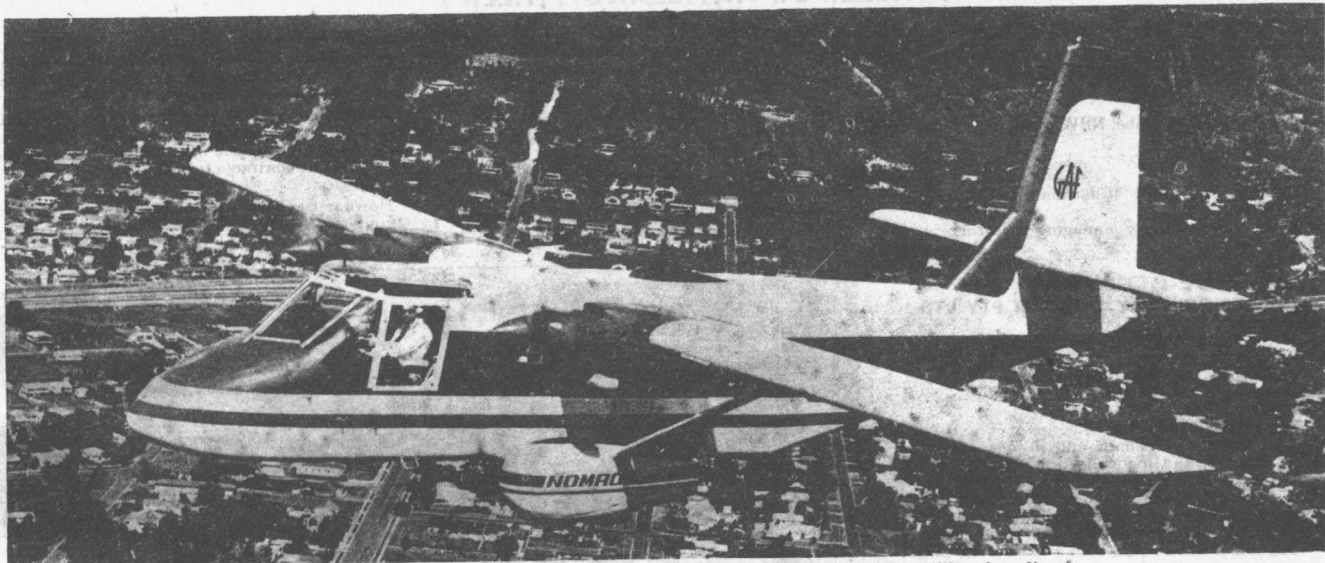
**GOVERNMENT AIRCRAFT FACTORIES NOMAD**

This small, twin-turboprop utility aircraft is in production at the GAF. Its design was started

in 1965 under the designation Project N, and the first of two Model N2 prototypes (VH-SUP) was flown for the first time on 23 July 1971; it was followed by the second aircraft (VH-SUR) on 5 December 1971. Design certification for the Nomad is to US FAR 23 requirements administered by the Australian Dept of Civil Aviation; the Type Certificate for the N2 was issued on 11 August 1972, and certification by the FAA and CAA is being negotiated. The basic design incorporates features of common interest to military and civil operators, including quick role-change capabilities and the ability to operate from short fields and unprepared surfaces.



Government Aircraft Factories N22 Nomad, with additional side view (bottom) of N24 (Pilot Press)



Prototype N22 version of the Government Aircraft Factories Nomad STOL utility aircraft

Two versions have so far been announced, as follows:

**N22.** Short-fuselage version, currently in production for the Australian Army Aviation Corps and commercial operators. The two prototypes were built to this standard.

**N24.** Higher-capacity version, with lengthened fuselage. Design includes the insertion of a 43 in (1.09 m) section in the cabin, and increased forward baggage capacity.

Production of 70 Nomads has been authorised by the Australian government. These will include an initial quantity of 11 for the Australian Army. China, the Philippines (18) and Indonesia (four) are also reported to have ordered Nomads, the last-named being intended for the Indonesian Navy. Sales of the Nomad throughout south-east Asia are handled by Hawker de Havilland.

The following description applies generally to both versions, except where a specific model is indicated:

**TYPE:** Twin-turboprop STOL utility aircraft.

**WINGS:** Braced high-wing monoplane. Basic NACA 23018 wing section, modified to incorporate increased nose radius and camber. Dihedral 1° from roots. Incidence 2°. No sweepback. Two-spar fail-safe torsion-box structure of riveted light alloy. Full-span double-slotted trailing-edge flaps. All-metal ailerons, which droop with the flaps and transfer their motion progressively to slip-lip ailerons as the flaps extend, resulting in full-span flap. Controls actuated manually by cables and pushrods. Pneumatic de-icing of leading-edges optional. Small stub wings at cabin floor level support the main landing gear fairings from which a single strut on each side braces the main wing.

**FUSELAGE:** Conventional semi-monocoque riveted light alloy structure of stringers and frames.

**TAIL UNIT:** Cantilever all-metal structure. One-piece all-moving tailplane, with inset trim and anti-balance tab. Tailplane and rudder actuated manually by cables. Trim tab in rudder. Pneumatic de-icing of leading-edges optional.

**LANDING GEAR:** Retractable tricycle type, with electrical retraction by means of single actuator in the fuselage. GAF oleo-pneumatic shock-absorbers. Single rearward-retracting steerable nosewheel, tyre size 8-00-6, pressure 35 lb/sq in (2.46 kg/cm<sup>2</sup>). Twin wheels, tyre size 8-00-6, pressure 29 lb/sq in (2.04 kg/cm<sup>2</sup>), on each main unit. Main wheels retract forward into streamlined fairings at outer ends of stub wings. Dual hydraulically-operated single-disc brakes on main units. No anti-skid units.

**POWER PLANT:** Two 400 shp Allison 250-B17 turboprop engines, each driving a Hartzell three-blade constant-speed fully-feathering reversible-pitch metal propeller. Fuel capacity 1,794 lb (813 kg) plus 25 lb (11.3 kg) unusable in flexible bag tanks; or 1,692 lb (767 kg) plus 25 lb unusable in self-sealing bag tanks. Provision for internal auxiliary tanks for ferry purposes. Gravity refuelling via overwing point above each pair of tanks. Oil capacity 1.9 Imp gallons (8.5 litres) per engine.

**ACCOMMODATION (N22):** Designed for single-pilot operation, but can accommodate crew of two on side-by-side seats. Access to flight deck by forward-opening door on each side. Main cabin has individual seats for up to 12 passengers, at 31 in (78 cm) pitch, with continuous seat tracks and readily-removable seats which allow rapid rearrangement of the cabin to suit alternative loads. Access to main cabin via double doors on port side, with single emergency exit on starboard side. Baggage compartments

in nose (with door on each side) and optionally in rear of fuselage (with internal access). Whole interior, including flight deck, is heated and ventilated.

**ACCOMMODATION (N24):** Flight deck accommodation and access as for N22. Lengthened main cabin, with similar internal provision to N22 for up to 15 passengers, and access via double port-side doors as in N22. Enlarged nose baggage compartment. Rear baggage compartment of same capacity as N22. Ventilation and heating system with individual adjustable outlets.

**SYSTEMS:** No air-conditioning, hydraulic or pneumatic system normally, but air-conditioning is proposed for future models and pneumatic airframe de-icing is available optionally. Electrical system comprises a 28V 150A DC starter/generator on each engine, and a 22Ah battery with AC inverters. Other optional systems include oxygen demand system for crew and continuous-flow system for passengers; electrical de-icing for propellers, cabin floor hatch and underwing pylon racks.

**ELECTRONICS AND EQUIPMENT:** Provision is made for a wide range of nav/comm equipment to meet specific customer requirements. Other optional items include full IFR instrumentation and a lightweight weather radar.

**ARMAMENT AND OPERATIONAL EQUIPMENT (N22):** The military variant has been designed to have four underwing hardpoints capable of accepting up to 500 lb (227 kg) loads, including gun and rocket pods. The nose bay can be utilised to accommodate surveillance and night vision aid equipment. Removable seat armour and self-sealing fuel tanks can be fitted for added protection.

**DIMENSIONS, EXTERNAL:**

Wing span	54 ft 0 in (16.46 m)
Wing chord (constant)	5 ft 11½ in (1.81 m)
Wing aspect ratio	9.11
Length overall:	
N22	41 ft 2.4 in (12.56 m)
N24	46 ft 3 in (14.10 m)
Height overall	18 ft 1½ in (5.52 m)
Tailplane span	17 ft 8.4 in (5.39 m)
Wheel track	10 ft 7 in (3.23 m)
Wheelbase: N22	11 ft 11.6 in (3.65 m)
Propeller diameter	7 ft 6 in (2.29 m)
Propeller ground clearance	4 ft 0 in (1.22 m)
Distance between propeller centres	14 ft 3.6 in (4.36 m)

<b>Crew doors (each):</b>	
Height	2 ft 10 in (0.86 m)
Width	2 ft 3 in (0.69 m)
<b>Passenger double doors (port):</b>	
Height	4 ft 4 in (1.32 m)
Width	4 ft 0 in (1.22 m)
Height to sill	2 ft 11 in (0.89 m)
<b>Emergency exit (stbd):</b>	
Height	1 ft 11 in (0.58 m)
Width	2 ft 1 in (0.63 m)

**DIMENSIONS, INTERNAL:**

<b>Cabin, excl flight deck and rear baggage compartment:</b>	
Length:	
N22	17 ft 0 in (5.18 m)
N24	20 ft 7 in (6.27 m)
Max width	4 ft 3 in (1.30 m)
Max height	5 ft 2.4 in (1.58 m)
<b>Floor area:</b>	
N22	70.25 sq ft (6.53 m <sup>2</sup> )
N24	87.0 sq ft (8.08 m <sup>2</sup> )
<b>Volume:</b>	
N22	360.0 cu ft (10.19 m <sup>3</sup> )
N24	440.0 cu ft (12.46 m <sup>3</sup> )
<b>Baggage compartment volume (nose):</b>	
N22	27 cu ft (0.76 m <sup>3</sup> )

N24	40.0 cu ft (1.13 m <sup>3</sup> )
<b>Baggage compartment volume (optional, rear):</b>	
N22, N24	28.0 cu ft (0.79 m <sup>3</sup> )

**AREAS:**

Wings, gross	324.0 sq ft (30.10 m <sup>2</sup> )
Ailerons (total net)	27.4 sq ft (2.55 m <sup>2</sup> )
Trailing-edge flaps (total net)	
Fin	105.6 sq ft (9.81 m <sup>2</sup> )
Rudder, incl tab	39.1 sq ft (3.63 m <sup>2</sup> )
Tailplane, incl tabs	31.1 sq ft (2.89 m <sup>2</sup> )
78.0 sq ft (7.25 m <sup>2</sup> )	

**WEIGHTS AND LOADINGS (N24 estimated):**

<b>Manufacturer's basic weight empty:</b>	
N22	4,451 lb (2,019 kg)
N24	4,530 lb (2,054 kg)
<b>Typical operating weight empty:</b>	
N22	4,750 lb (2,154 kg)
<b>Max disposable load:</b>	
N22	3,834 lb (1,739 kg)
<b>Max T-O and landing weight:</b>	
N22, N24	8,500 lb (3,855 kg)
<b>Max wing loading:</b>	
N22, N24	26.2 lb/sq ft (127.9 kg/m <sup>2</sup> )
<b>Max power loading:</b>	
N22, N24	10.625 lb/shp (4.819 kg/shp)

**PERFORMANCE (at max T-O weight, ISA at S/L except where indicated otherwise; N24 estimated):**

<b>Normal cruising speed:</b>	
N22, N24	168 knots (193 mph; 311 km/h)
<b>Stalling speed, power off, flaps up, at AUW of 7,500 lb (3,402 kg):</b>	
N22, N24	85 knots (75 mph; 121 km/h)
<b>Stalling speed, power off, flaps down, at AUW of 7,500 lb (3,402 kg):</b>	
N22, N24	47 knots (54.5 mph; 88 km/h)
<b>Max rate of climb at S/L, both engines, T-O rating for 5 min:</b>	
N22, N24	1,410 ft (430 m)/min
N22, N24 (ISA + 20°C)	1,200 ft (366 m)/min
<b>Rate of climb at S/L, one engine out, max continuous rating:</b>	
N22, N24	240 ft (73 m)/min
N22, N24 (ISA + 20°C)	80 ft (24 m)/min
<b>Service ceiling, both engines, climbing at 100 ft (30.5 m)/min, max cruise rating:</b>	
N22, N24	22,500 ft (6,860 m)
<b>Min ground turning radius:</b>	
N22, N24	38 ft 3 in (11.66 m)
<b>Runway LCN at max T-O weight:</b>	
N22, N24	2.3
<b>T-O run:</b>	
N22, N24 (FAR 23)	720 ft (219 m)
N22, N24 (STOL)	580 ft (177 m)
N22, N24 (FAR 23), ISA + 20°C	960 ft (293 m)
N22, N24 (STOL), ISA + 20°C	820 ft (250 m)
<b>T-O to 50 ft (15 m):</b>	
N22, N24 (FAR 23)	1,350 ft (411 m)
N22, N24 (STOL)	950 ft (290 m)
N22, N24 (FAR 23), ISA + 20°C	1,790 ft (546 m)
<b>Landing from 50 ft (15 m), AUW of 7,500 lb (3,402 kg):</b>	
N22, N24 (FAR 23)	1,295 ft (395 m)
N22, N24 (STOL)	710 ft (216 m)
N22, N24 (FAR 23), ISA + 25°C	1,370 ft (418 m)
<b>Landing run, AUW of 7,500 lb (3,402 kg):</b>	
N22, N24 (FAR 23)	620 ft (189 m)
N22, N24 (STOL)	340 ft (104 m)
N22, N24 (FAR 23), ISA + 25°C	675 ft (206 m)
<b>Max range at 90% power, reserves for 45 min hold:</b>	
N22 at S/L	660 nm (760 miles; 1,223 km)
N22, N24 at 10,000 ft (3,050 m)	855 nm (985 miles; 1,585 km)



**HAWKER DE HAVILLAND**  
**HAWKER DE HAVILLAND AUSTRALIA PTY. LTD**  
 (Member Company of HAWKER SIDDELEY GROUP)

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**DIRECTORS:**  
 R. Kingsford-Smith (Chairman and Managing Director)  
 L. R. Jones (Deputy Managing Director)

H. B. M. Vose  
 B. S. Price (Commercial Director)  
 S. S. Schatzel (Director and Chief Designer)  
 I. S. Gregg

**PUBLIC RELATIONS MANAGER:**  
 John D. S. Keatinge

This company manufactures components and equipment, and carries out repair and overhaul work, for a wide range of military and civil aircraft and aero-engines, propellers and accessories. Details of these and other activities can be

found in the 1972-73 *Jane's*.

A subsidiary of the company, Hawker Siddeley Electronics Ltd, is engaged in guided weapons and other defence contracts.

Another subsidiary, Hawker Siddeley Research Pty Ltd, is an approved research organisation and is actively engaged in a number of design and development contracts for the Australian defence authorities.

Hawker de Havilland is responsible for sales throughout south-east Asia of the GAF Nomad transport aircraft.

**LOBET-DE-ROUVRAY**  
**LOBET-DE-ROUVRAY AVIATION PTY LTD**

**ADDRESS:**  
 Suite 7/506 Miller Street, Cammeray, New South Wales 2062  
 Telephone: 922 2599 and 922 2960

**DIRECTOR:**  
 James Lobet

The original Ganagobie was designed and built by the brothers William and James Lobet at Lille, France, and made its first flight in 1953, powered by an old Clerget engine. After modification and redesignation as Ganagobie 02 it flew for a further 30 hours before being grounded by engine failure in 1954, and later became Ganagobie 2 when fitted with a two-stroke target drone engine. Further modifications were then incorporated.

The second aircraft, Ganagobie 3, was built in Alberta, Canada, by Mr La Rue Smith; built of birch plywood, it was somewhat heavier than the first aircraft and was powered by a 72 hp McCulloch engine. A later Ganagobie 3 was fitted with a 40 hp Continental engine, and this version is also suitable for converted Volkswagen engines of 1,500 cc and above. The "ultra-light" version, known as the Ganagobie 4, is suitable for 48 hp Nelson and other small two-stroke engines. Very light okoumé mahogany, and other weight-saving features, may be used in its construction. Latest version is the Ganagobie 05.

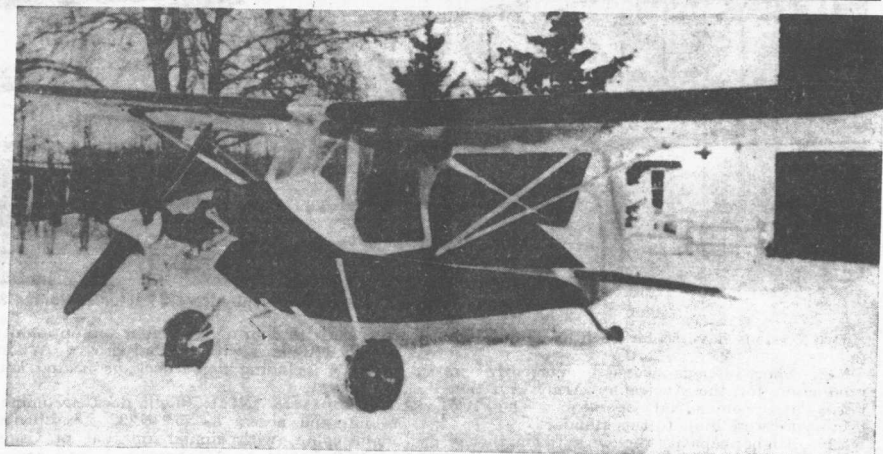
**GANAGOBIE 05**

The Ganagobie 05 is a small, high-wing single-seat aircraft, designed primarily for amateur construction. Its general appearance is shown in the accompanying illustration.

Construction of the basic homebuilt aircraft is all-wooden; but production versions are under consideration, either in kit form with a fabric-covered steel-tube fuselage and wooden wings and tail, or in factory-built form with all-metal fabric-covered wing and tail control surfaces. The following description applies to the all-wood homebuilt version:

**TYPE:** Single-seat homebuilt light aircraft.

**WINGS:** Braced high-wing monoplane. Wing section NACA 23012. Constant-chord wings, with main and auxiliary spars and semi-circular tips. Centre-section integral with top of fuselage. Main panels have dihedral and can be detached for storage and transit, being carried in frames attached to the landing gear and cabane fittings on each side of the fuselage. A special frame fits over the rear of the fuselage to provide added support. Wooden spars and ribs, with non-structural plywood or aluminium leading-edge and fabric covering. Cable-operated plain ailerons. No flaps. Wings braced to fuselage by streamline-section steel-tube vee strut assembly on each side.



Ganagobie 05 ultra-light aircraft designed by James and William Lobet

**FUSELAGE:** Basically wooden structure, of diamond-shaped cross-section, consisting of spruce longerons, 12 bulkheads and formers, and plywood covering. Steel-tube engine mounting frame and wing-root cabane structure.

**TAIL UNIT:** Plywood-covered wooden fin and strut-braced tailplane; fabric-covered wooden elevators and horn-balanced rudder. Struts detachable to permit horizontal surfaces to fold upwards for storage and transit. Rudder and elevators cable-operated. Trim tab on port elevator.

**LANDING GEAR:** Non-retractable main wheels and tailskid or (optionally) tailwheel. Main wheels are mounted on tripod struts, the main legs of which have rubber-in-compression shock-absorption, and are of 8 in (20.3 cm) diameter with 8-00-4 tyres. Spoon-type tailskid mounted at end of a flat spring beneath rear fuselage. Front-wheel brakes are necessary if a tailwheel is fitted.

**POWER PLANT:** Aircraft is designed for a modified VW engine of at least 35 hp, with direct-drive two-blade propeller; a typical engine is the Sportavia Limbach SL 1700 D. Alternatively, geared-down VW engines with either vee-belt or gear reduction drive may be installed, provided that aircraft does not exceed its weight and CG range limitations. Fuel in two wing tanks between main and auxiliary spars; almost all of fuel load is usable.

**ACCOMMODATION:** Single seat in fully-enclosed

cabin, with upward-opening door on each side. Ventilation devices in each transparent door panel. Seat belt attached to bulkhead.

**DIMENSIONS, EXTERNAL:**

Wing span	24 ft 3½ in (7.40 m)
Wing chord (constant)	3 ft 11¼ in (1.20 m)
Wing aspect ratio	6.25
Length overall	16 ft 1½ in (4.92 m)
Height overall	6 ft 0 in (1.83 m)
Tailplane span	7 ft 9½ in (2.38 m)
Wheel track	4 ft 11 in (1.50 m)
Propeller diameter (direct drive)	4 ft 11 in (1.50 m)

**AREAS:**

Wings, gross	92.25 sq ft (8.57 m²)
Ailerons (total)	11.61 sq ft (1.079 m²)
Fin	5.02 sq ft (0.466 m²)
Rudder	4.71 sq ft (0.438 m²)
Tailplane	10.63 sq ft (0.988 m²)
Elevators, incl tab	6.51 sq ft (0.605 m²)

**WEIGHTS AND LOADING:**

Weight empty	630 lb (285 kg)
Max T-O weight	800 lb (362 kg)
Max wing loading	8.88 lb/sq ft (43.4 kg/m²)

**PERFORMANCE (at max T-O weight, theoretical, with SL 1700 D engine):**

Max level speed	98 knots (113 mph; 182 km/h)
Max cruising speed (75% power)	87 knots (100 mph; 161 km/h)
Stalling speed	41 knots (47 mph; 76 km/h)
Service ceiling	10,000 ft (3,050 m)

**MILLICER**

**HENRY MILLICER**

**ADDRESS:**

c/o Royal Melbourne Institute of Technology,  
 124 Latrobe Street, Melbourne, Victoria

Mr Millicer, who in 1953 designed the original Airtourer light aircraft (see under "Aerospace" heading in New Zealand section), has recently designed an ultra-light aeroplane known as the Airmite.

**MILLICER AIRMITE**

Mr Millicer, who was for 10 years Chief Aerodynamicist of the Australian Government Aircraft Factories, is currently principal lecturer in aeronautics at the Royal Melbourne Institute of Technology. Assisted by students at the RMIT, he was building, in the Spring of 1974, the prototype of the Airmite, an all-metal single-seat ultra-light aeroplane built mainly of aluminium alloy.

It is designed for marketing in kit form, and to be capable of assembly in a normal-sized

garage or workshop by homebuilders of average abilities, using standard commercially-available pop-riveting tools.

**DIMENSIONS, EXTERNAL:**

Wing span	19 ft 0 in (5.79 m)
Length overall	18 ft 0 in (5.49 m)

**WEIGHT:**

Max T-O weight	600-800 lb (272-362 kg)
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**PERFORMANCE (approx):**

Max level speed	200 knots (230 mph; 370 km/h)
Stalling speed	42 knots (48.5 mph; 78 km/h)
Range	370 nm (425 miles; 685 km)

**PHILLIPS**

**D. A. PHILLIPS**

**ADDRESS:**

D. A. Phillips, VTOL Aircraft (Australia) Pty Ltd, PO Box 5195C, Newcastle West, New South Wales 2302

Telephone: 435348

**PHILLIPS PHILICOPTER Mk 1**

Mr Phillips, assisted by Mr P. Gerakiteys, designed and built a prototype two-seat helicopter known as the Philicopter Mk 1. Design work began in 1962, construction started in 1967, and the prototype flew for the first time in 1971. Certification trials were under way in early 1972. Orders for eight Philicopters had been received by the end of February 1972.

No news of this aircraft has been received since that time.

**TYPE:** Two-seat light helicopter.

**ROTOR SYSTEM:** Two-blade main and tail rotors. Main rotor blades, of NACA 0012 section and fully-extruded hollow-section construction, are attached to hub by solid grips. Fixed tab on each trailing-edge. Tail rotor blade construction similar to main rotor blades.

**ROTOR DRIVE:** Via three gearboxes: one transfer box, one reduction box and one tail rotor box. Main rotor/engine rpm ratio 1 : 5.66; tail rotor/engine rpm ratio 1 : 1.

**FUSELAGE:** Tubular steel airframe, with aluminium and glassfibre covering.

**TAIL UNIT:** Tubular steel open space-frame. Tailplane incidence adjustable manually on ground.

**LANDING GEAR:** Tubular skid type. Shock-absorption through bending and torsion of cross-members. Ground handling wheels. Float gear available optionally.

**POWER PLANT:** One 145 hp Rolls-Royce Continental O-200-C four-cylinder horizontally-

opposed aircooled engine. Single fuel tank, capacity 18 Imp gallons (82 litres). Oil capacity 1.25 Imp gallons (5.7 litres).

**ACCOMMODATION:** Side-by-side seating for pilot and one passenger. Door on each side of cabin. Accommodation ventilated.

**SYSTEMS AND EQUIPMENT:** Battery for electrical power. Radio fitted.

**DIMENSIONS, EXTERNAL:**

Main rotor diameter	25 ft 6 in (7.77 m)
Tail rotor diameter	4 ft 0 in (1.22 m)
Distance between rotor centres	13 ft 9 in (4.19 m)

Main rotor blade chord (each)	8 in (20.3 cm)
Length overall, rotors fore and aft	28 ft 10 in (8.79 m)
Length of fuselage	21 ft 10 in (6.65 m)

Height to top of rotor hub	8 ft 0 in (2.44 m)
Height overall	8 ft 4 in (2.54 m)
Skid track	6 ft 4 in (1.93 m)

**DIMENSIONS, INTERNAL:**

Cabin: Length 5 ft 4 in (1.63 m)  
 Max width 3 ft 10 in (1.17 m)  
 Max height 4 ft 2 in (1.27 m)

**AREAS:**

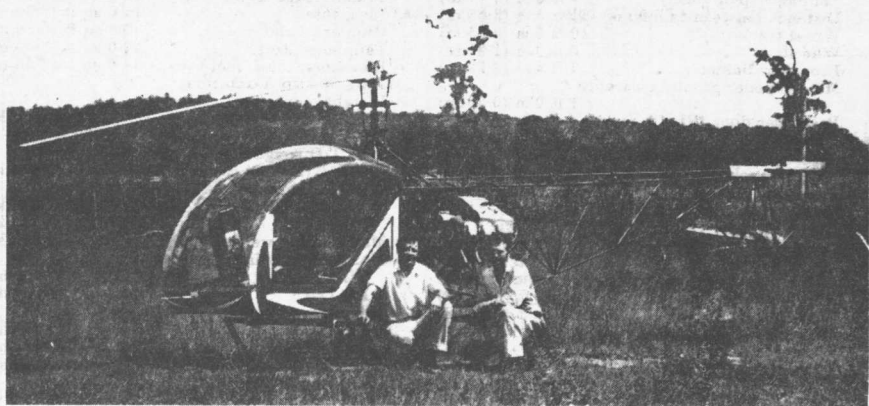
Main rotor blades (each) 9.56 sq ft (0.89 m<sup>2</sup>)  
 Tail rotor blades (each) 0.50 sq ft (0.046 m<sup>2</sup>)  
 Main rotor disc 510.00 sq ft (47.38 m<sup>2</sup>)  
 Tail rotor disc 12.56 sq ft (1.17 m<sup>2</sup>)

**WEIGHTS AND LOADINGS:**

Weight empty 1,050 lb (476 kg)  
 Max T-O and landing weight 1,650 lb (748 kg)  
 Max disc loading 3.24 lb/sq ft (15.82 kg/m<sup>2</sup>)  
 Max power loading 11.35 lb/hp (5.15 kg/hp)

**PERFORMANCE (at max T-O weight):**

Max level speed 78 knots (90 mph; 145 km/h)  
 Max cruising speed 74 knots (85 mph; 137 km/h)  
 Econ cruising speed 60.5 knots (70 mph; 112.5 km/h)  
 Max rate of climb at S/L 1,200 ft (365 m)/min  
 Vertical rate of climb at S/L 300 ft (91 m)/min  
 Service ceiling 16,000 ft (4,880 m)  
 Hovering ceiling in ground effect 8,000 ft (2,440 m)



Phillips Philicopter Mk 1 prototype (145 hp Rolls-Royce Continental O-200-C engine) (S. J. Cherez)

Hovering ceiling out of ground effect (optimum) 6,000 ft (1,830 m) Range with max fuel 200 nm (230 miles; 370 km)

**TRANSAVIA**

**TRANSAVIA CORPORATION PTY, LTD**

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**CHAIRMAN:**

F. Belgiorno-Nettis

**DIRECTOR:**

C. Salteri

**GENERAL MANAGER:**

G. Forrester

Transavia Corporation was formed in 1964 as a subsidiary of Transfield Pty Ltd, one of Australia's largest construction companies.

Its first product is the multi-purpose PL-12 Airtruk.

**TRANSAVIA PL-12 AIRTRUK**

The Airtruk, designed by Mr Luigi Pellarini, was originally type-certificated on 10 February 1966, for spreading fertiliser and for seeding. Swath width is up to 35 yd (32 m) and of unusual uniformity. A liquid-spraying conversion, developed in 1968, is capable of covering a 33 yd (30.2 m) swath. This version has an engine-driven spray pump and a liquid chemical capacity of 180 Imp gallons (818 litres). The PL-12's unconventional layout keeps the tails clear of chemicals, and also permits rapid loading by a vehicle which approaches the aircraft between the tails.

The three-seat prototype Airtruk flew for the first time on 22 April 1965. Delivery of production Airtruks began in December 1966, and a total of 60 PL-12s had been built by June 1973, for customers in Australia, New Zealand, Thailand and Africa. These included 40 for export, of which 22 were for New Zealand and nine (including three PL-12-U's) for Thailand.

Production of the PL-12 was continuing in 1974, together with that of the PL-12-U, a multi-purpose cargo/passenger/ambulance/aerial survey version of which a prototype flew for the first time in December 1970. Certification of this version was granted in February 1971, by which time two production aircraft had been completed, and deliveries began later in the year.

Airtruks are being assembled by Barr Brothers in New Zealand (which see).

The following description applies to both the PL-12 and PL-12-U, except where a particular version is indicated:

**TYPE:** Single-engined agricultural (PL-12) or multi-purpose (PL-12-U) aircraft.

**WINGS:** Strut-braced sesquiplane. Wing section NACA 23012. Dihedral 1° 30' on upper wings. Incidence (upper wings) 3° 0'. Conventional all-metal structure, covered with Alclad sheet. All-metal trailing-edge flaps and ailerons, covered with ribbed Alclad sheet, and operated manually. Small stub wings below fuselage, braced to cabin by a single strut and to upper wings by a Vee-strut each side.

**FUSELAGE:** Pod-shaped structure, of 4130 welded steel tube construction with 2024 Alclad covering and glassfibre tailcone.

**TAIL UNIT:** Twin units, each comprising a fin, rudder and separate "T" tailplane and elevator,

and each carried on a cantilever tubular Alclad boom extending from the upper wings. Small bumper fairing underneath each fin. Manually-operated control surfaces. Adjustable tab in each elevator. No tabs on rudder.

**LANDING GEAR:** Non-retractable tricycle type, each of the three wheels being carried on a pivoted trailing leg. Shock-absorbers of Transavia patented type, of bonded rubber block moulded within four hinged plates forming a diamond shape, loaded at the long axis and deformed by loads to exchange long and short axes. All wheels and tyres same size, 8-00-6. Nosewheel tyre pressure 20 lb/sq in (1.41 kg/cm<sup>2</sup>); main-wheel tyre pressure 32 lb/sq in (2.25 kg/cm<sup>2</sup>). Cleveland brakes.

**POWER PLANT:** One 300 hp Continental IO-520-D six-cylinder horizontally-opposed aircooled engine, driving a McCauley D2A34C58/90AT-2 two-blade constant-speed metal propeller. Two upper-wing fuel tanks, total usable capacity 40 Imp gallons (181.5 litres). Optional long-range installation of second tank in each upper mainplane, increasing total capacity to 82 Imp gallons (373 litres). Refuelling point above

each upper wing. Oil capacity 2.5 Imp gallons (11.4 litres).

**ACCOMMODATION (PL-12):** Single-seat cockpit, with door on starboard side. Two-seat cabin aft of chemical hopper/tank for carriage of ground crew, with door at rear of lower deck. Accommodation heated and ventilated.

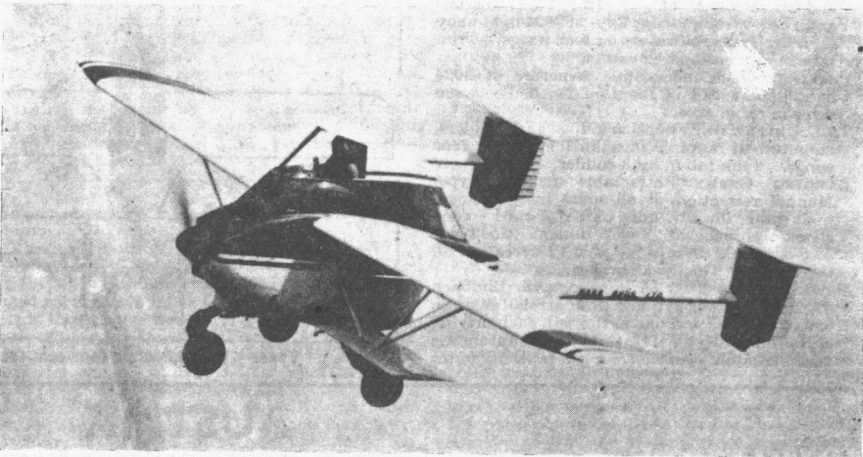
**ACCOMMODATION (PL-12-U):** Single-seat cockpit as in PL-12. By removing the central hopper or tank, passenger cabin is enlarged to seat one passenger on upper deck (back to back with pilot's seat) and four more passengers on lower deck. Doors on upper deck (starboard side) and lower deck (port side). Lower-deck cabin is heated.

**SYSTEMS:** 12V electrical system standard.

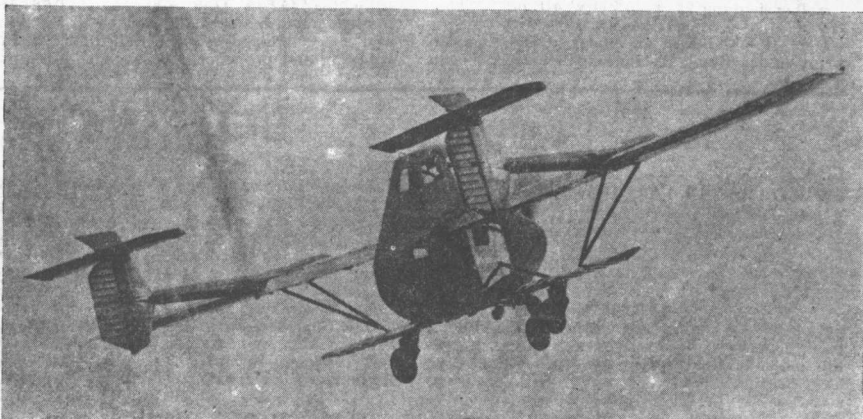
**ELECTRONICS AND EQUIPMENT:** Optional equipment for PL-12-U includes VHF (also available optionally for PL-12), HF, ADF, artificial horizon and directional gyro.

**DIMENSIONS, EXTERNAL:**

Wing span 39 ft 3 1/2 in (11.98 m)  
 Wing chord (constant) 5 ft 9 in (1.75 m)  
 Length overall 21 ft 0 in (6.40 m)  
 Length of fuselage 13 ft 0 in (3.96 m)



Transavia PL-12 Airtruk agricultural aircraft (300 hp Continental IO-520-D engine) (K. Meehan)



PL-12-U multi-purpose cargo/passenger/ambulance/survey version of the Airtruk