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NOV. 6, 1950

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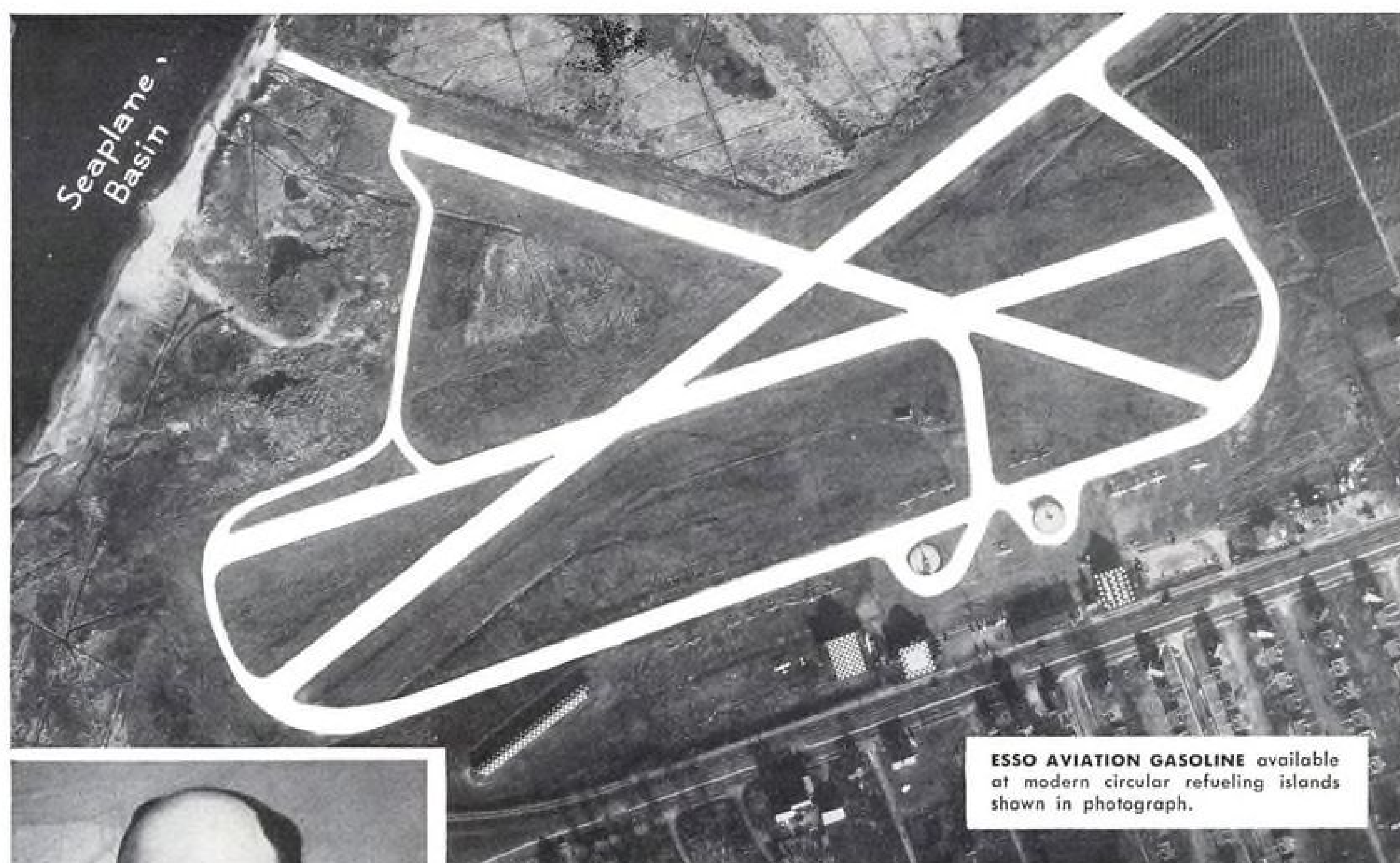
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# Aviation Week



Member



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November 6, 1950

Number 19

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AVIATION WEEK, November 6, 1950

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11 YEARS

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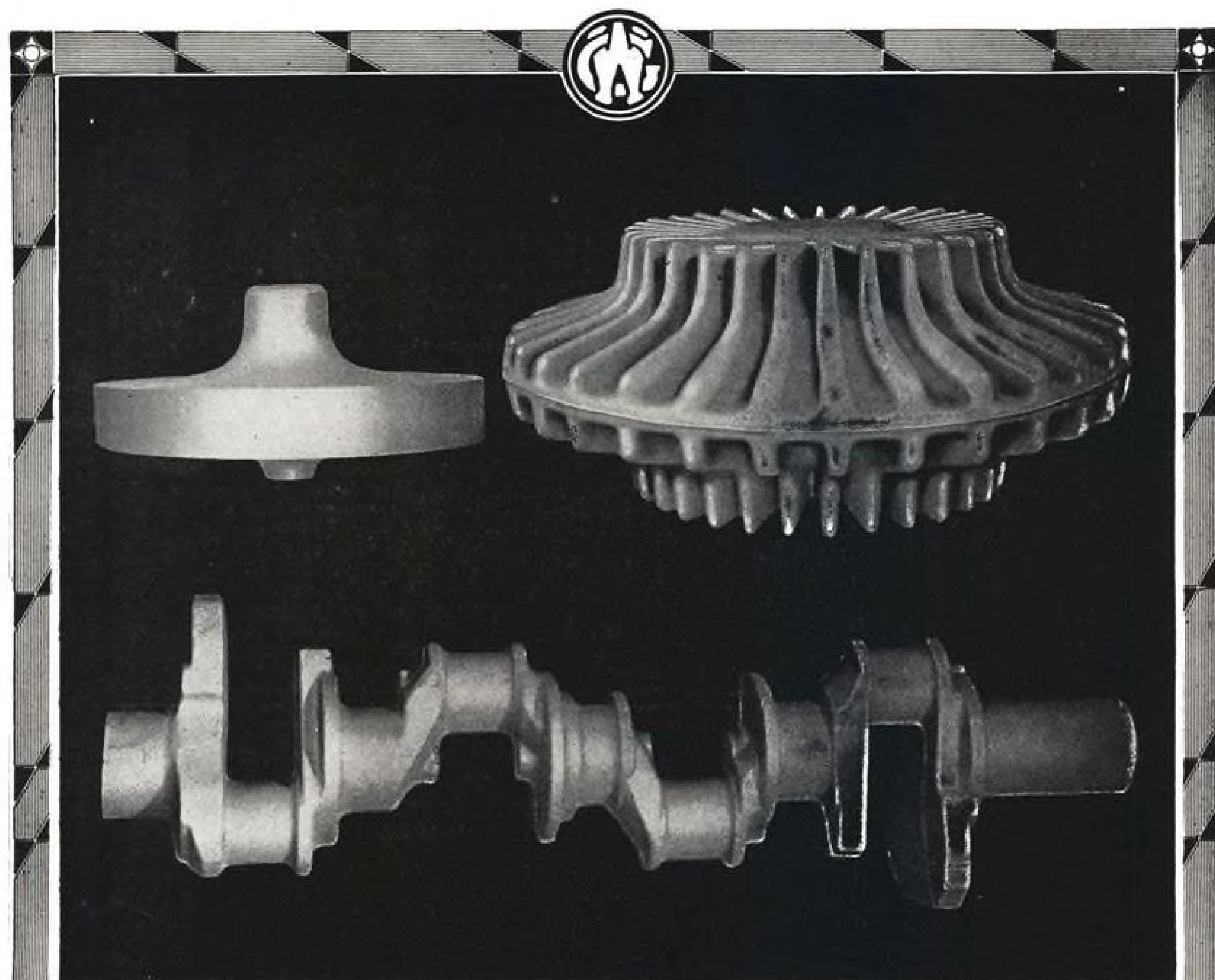
The Phantom, the Banshee, the XHJD-1, Little Henry . . . history makers of the modern jet era . . . products of a youthful organization self-called the McDonnell team. Fafnir has worked closely with the McDonnell team from the start. But . . . to keep up with this pace-setting group calls for more than just good ball bearings. It's a reflection of Fafnir's attitude and aptitude, a way of looking at ball bearings from the designer's side, an aptitude gained from more than twenty years' specialization in aircraft ball bearings. The Fafnir Bearing Company, New Britain, Connecticut.

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## NEWS DIGEST

### DOMESTIC

Relocation of IFF radio antenna from the bottom of the top of the Air Rescue SB-29 is being projected by Air Materiel Command. Changeover was found necessary to facilitate fitting of the large A-3 lifeboat to the plane.

Charles J. Follmer, president of the Eagle Parachute Co., Lancaster, Pa., died at his home on Oct. 3.

Three-week strike of both Pierce Governor Co. plants at Anderson, Ind., ended Oct. 30 with signing of a five-year contract with UAW-CIO in which hourly wage employees got increases of up to 17 cents per hour. The new agreement is similar to the General Motors contract. During the dispute 650 men were out. The firm makes regulators and precision controls for jet engines.

Wright A. Parkins, engineering manager for Pratt & Whitney Aircraft, has been named a member of the industry and educational advisory board of the USAF Arnold Engineering Development Center, Tullahoma, Tenn.

Boris P. Labensky, associated with Sikorsky since 1922, died at his home in Stratford, Conn. at the age of 55. For the past ten years he had been connected with helicopter development as experimental engineer with Sikorsky.

Daedalian Trophy for record flying safety in the USAF for 1949 was presented to Eglin AFB, Fla. The trophy was presented in the name of the Order of Daedalians, a fraternal organization of World War I pilots.

Maj. Gen. Gordon P. Saville, USAF Deputy Chief of Staff for Development, has been sworn in as a member of NACA, replacing USAF Chief of Staff Hoyt S. Vandenberg.

Rear Adm. Maurice Edwin Curts, USN, has been designated Navy member of the Research & Development Board, succeeding Rear Adm. R. P. Briscoe, who has been assigned as Commander, Amphibious Force, Atlantic Fleet. Curts has recently been assigned to the office of Chief of Naval Operations.

### FINANCIAL

Republic Aviation Corp. reports a net income after taxes of \$1,023,455 for the

nine months ended Sept. 30, with sales for this period being \$43,021,600 and backlog coming to \$270 million. Comparable period in 1949 showed income of \$414,100; sales of \$26,597,503 and backlog at \$49 million.

National Airlines shows a net profit of \$181,007, equal to 18.1 cents per share, for July, Aug. and Sept., the first quarter of this fiscal year. This compares with a loss of \$521,312 for the same quarter last year. Total revenue in this year's first quarter was \$4,074,312 which is 31.35 percent over last year's first-quarter figure. National's revenue passenger miles increased 42.2 percent to 61,333,101, air freight went up 158.9 percent, mail increased 41.1 percent and air express gained 54.7 percent.

Boeing Airplane Co. has declared a \$2-per-share dividend payable on Nov. 24 to stockholders of record as of close of business Nov. 3. For the first nine months of this year, net earnings were \$8,210,252, almost double last year's. Total sales and other income came to \$207,606,569.

Standard-Thomson Corp. reports for the three months ended Aug. 31, a net profit of \$234,591, after all taxes and charges, with sales for the quarter being \$2,123,000, and backlog totaling \$4.7 million.

Beech Aircraft Corp. voted a quarterly dividend of 20 cents per share on common stock payable on Nov. 20, to stockholders of record at the close of business Nov. 6. Gross sales for the company's fiscal year, were over \$16 million, and backlog is well over \$50 million.

Cessna Aircraft Co. has declared a 20-cents-per-share dividend on stock outstanding payable Dec. 7 to stockholders of record Nov. 21.

Westinghouse Electric Corp. notes third quarter net sales billed totaled \$271,713,979, with net income after taxes of \$21,872,493.

### INTERNATIONAL

Air France has purchased four more Lockheed Constellations for about \$4.2 million, bringing its Connie lineup to 23, all long-range models. The contract, signed by Max Hymans, board chairman of Air France and Robert E. Gross, Lockheed president, is the seventh Connie reorder by the international carrier.

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## AVIATION CALENDAR

- Nov. 9-10—Sixth annual meeting, The Magnesium Assn., Biltmore Hotel, N. Y.
- Nov. 9-10—Society of Automotive Engineers national fuels and lubricants meeting, The Mayo, Tulsa, Okla.
- Nov. 14—ICAO rules of the air and air traffic control meeting, fourth session, Montreal, Canada.
- Nov. 23-26—Snowbird Soaring Meet, sponsored by Elmira Area Soaring Corp., Elmira, N. Y.
- Nov. 26-Dec. 1—71st annual meeting, American Society of Mechanical Engineers, Hotel Statler, New York.
- Nov. 28-30—Airport fire safety clinic sponsored by the National Fire Protection Assn. committee on aviation and airport fire protection, Baker Hotel, Dallas.
- Nov. 29-Dec. 1—Eighth annual meeting of Aviation Distributors and Manufacturers Assn., Ambassador Hotel, Los Angeles.
- Nov. 30—Airport fire safety clinic, sponsored by Committee on Aviation and Airport Fire Protection of the National Fire Protection Assn., Baker Hotel, Dallas.
- Dec. 7-8—Auction sale of aeronautical books, furniture, paintings, prints and furnishings, Plaza Auction Rooms, 9 E. 59 St., New York.
- Dec. 8—Aviation Associates show and dance, Town Hall, Philadelphia.
- Dec. 16—14th Wright Brothers Lecture, Institute of Aeronautical Sciences, U. S. Chamber of Commerce Auditorium, Washington, D. C.
- Jan. 6-7, 1951—Florida Air Pilots Assn. air show and exposition of planes and equipment, Opa Locka Airport, Miami, Fla.
- Jan. 8-10—Eighth annual air cruise Miami-Havana, and return, of Florida Air Pilots Assn.
- Jan. 15-18—Plant maintenance show and concurrent conference on plant maintenance techniques, Cleveland, Ohio.
- Jan. 29-Feb. 1—19th annual meeting of the Institute of Aeronautical Sciences, Hotel Astor, N. Y.
- Apr. 24-26—ATA annual engineering and maintenance conference, Hotel Drake, Chicago.
- June 11-15—Second annual conference on industrial research, conducted by Columbia University Dept. of Industrial Engineering, New York.
- Sept. 7-11—Third annual Anglo American Aeronautical Conference, convened jointly by Royal Aeronautical Society and IAS, Brighton, England.
- Sept. 10-14—Sixth national instrument conference and exhibit, sponsored by Instrument Society of America, Sam Houston Coliseum, Houston, Tex.

## PICTURE CREDITS

9—XB-51, Glenn L. Martin Co.; B-26, INP; 14—Dept. of Defense; 21—BEGA; 22—(top and bottom) David A. Anderton; (center) Fred Brewster; 28, 29—Beech Aircraft.

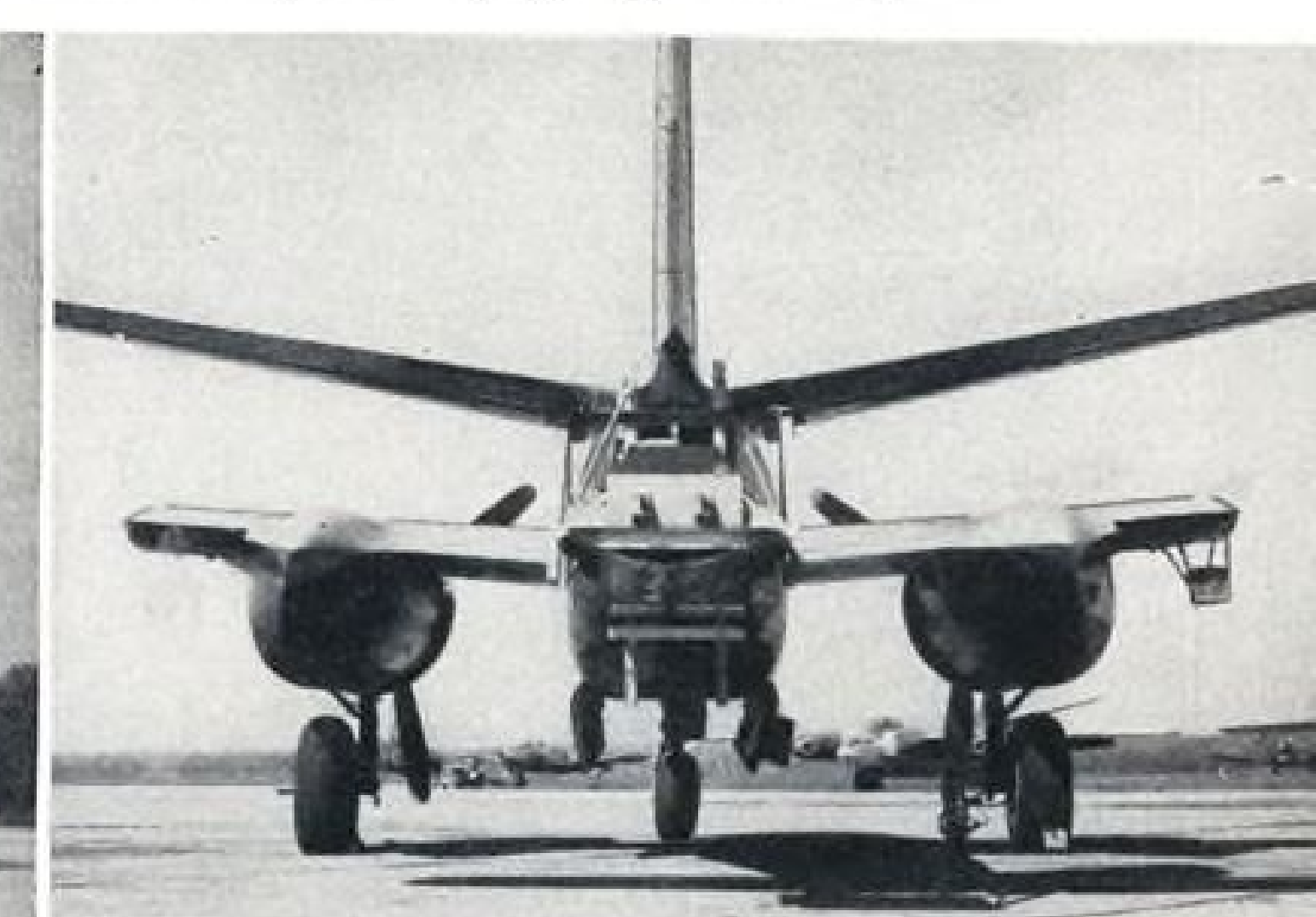


**AJ-1 TRIES SEA LEGS**—Biggest plane yet to work off a carrier is the above North American AJ-1, flown on and off the USS Coral Sea by pilots of Composite Squadron 5 during maneuvers off the

Atlantic Coast (see page 14). The combination piston-jet AJ-1 weighs over 25 tons, is powered by two P&W R-2800s and one fuselage-mounted Allison J-33 turbojet, giving over 400 mph.



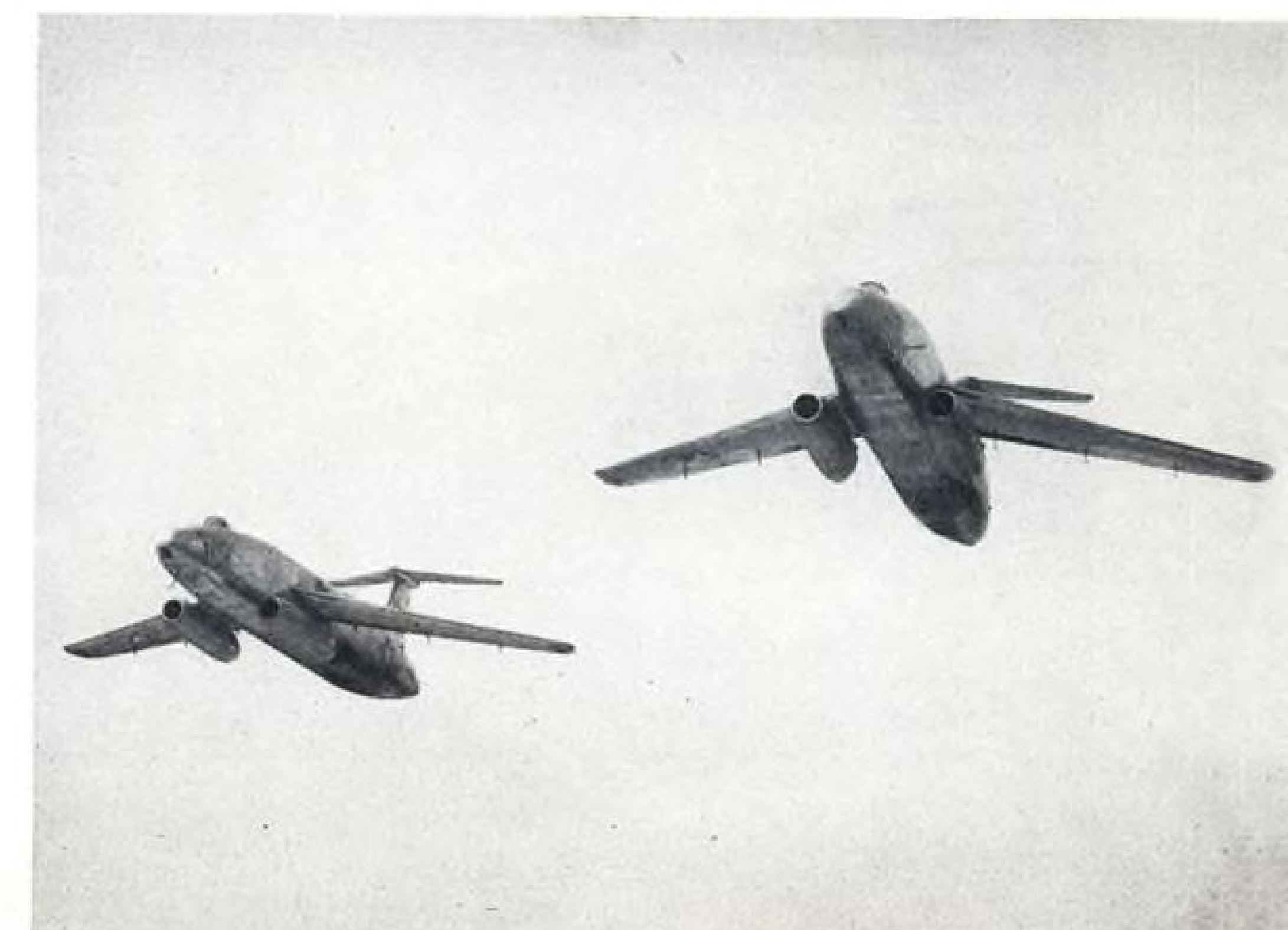
**SKID TESTER**—USAF Air Materiel Command is using this clipped-wing Douglas B-26 to gain valuable test data needed for design of stronger, lighter, smaller landing gears. In the left view,



the novel B-26 is running a skid test. The plane can withstand a wheel loading of about 15,000 lb. on each tire and brake when skidded at a stop speed of 150 mph. Photo (right) shows stub wings.

## News Picture Highlights

**GROUND-SUPPORT DUO**—Two Martin XB-51 ground support bombers pair up for first formation photo, providing an infantryman's-eye-view of the triple-jet-powered craft. The two-placers have three GE J-47 jets, two in outboard pylons and one inside the fuselage. Note "T" formation tail assembly. The 35-deg. sweptback wings have variable incidence, are about 55 ft. in span.





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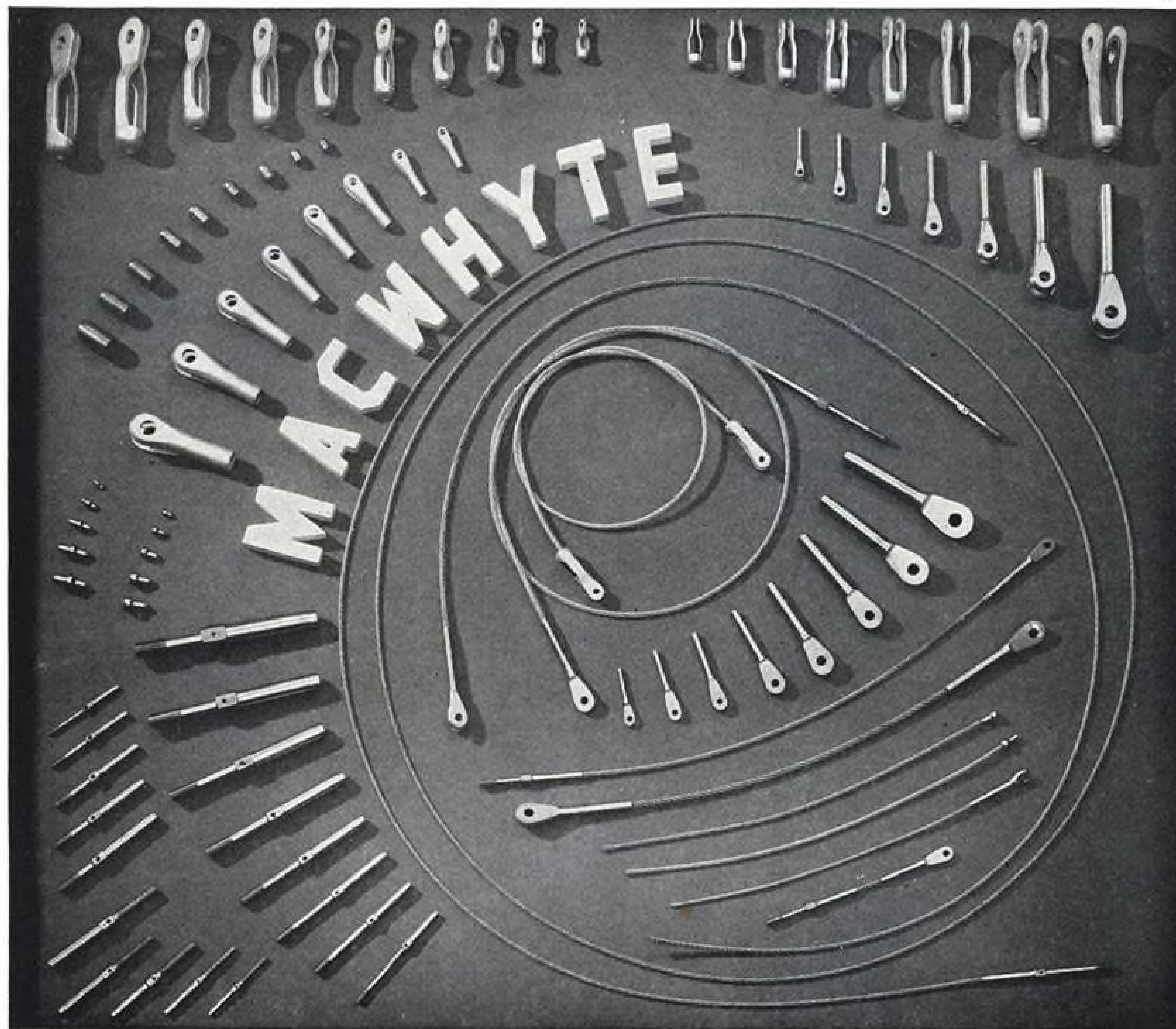
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## WHO'S WHERE

### Changes

Philip L. Ward, formerly manager of Solar Aircraft's Washington, D. C., activities, has become assistant chief engineer of the company's newly formed development engineering division in San Diego. Capt. Samuel J. Zeigler, (USN, ret.) has been named Solar's eastern engineering representative.

L. E. Wedel, formerly contracts manager of the W. L. Maxson Corp., has been promoted to chief of the control department and assistant to the vice president in charge of engineering. S. Merrill Skeist, formerly Maxson contract administrator, has been named contracts manager in charge of all negotiations with government agencies.

Thomas F. Bergmann has been appointed manager of the sales engineering division and Gordon V. Christy has been named West Coast sales engineer for Wright Aeronautical Corp.

Arthur W. Eichmann has been named to sales engineering staff of Lear, Inc., and will be based at the company's Teterboro, N. J., office. He was formerly with General Electric and Glenn L. Martin.

A series of organizational appointments have been made at Gordon D. Brown & Associates, Beverly Hills, Calif., airplane cargo and passenger fastening equipment makers: W. T. Ashby has been promoted to general manager, E. H. Borgard has been named production manager, E. C. Elsner fills the position of chief designer, and E. J. Foley has been named eastern representative.

Lt. Col. Frederick W. Klein has joined the staff of Boeing Airplane Co.'s USAF resident representative as chief of the office's contract section.

R. J. Krause has been placed in charge of the New York sales office of the Pacific division of Bendix Aviation Corp. L. A. Davidson has assumed inside sales duties at the N. Hollywood office. H. D. Wilkinson has been named manager of the military contracts department, with G. L. Muller as contract administrator.

Joseph P. Connor, Jr., formerly administrative officer for the Bureau of Internal Revenue, has been appointed treasurer of Aircraft Engine & Parts Corp., N. Y.

A. V. Leslie has left Trans World Airlines, where he was vice president-treasurer, to become treasurer of Hughes Tool Co. Earl M. Constable has been named TWA treasurer in Leslie's place. Clarence E. Fleming, TWA vice president is assuming additional responsibilities at the airline's Kansas City office, where he has been transferred from Washington, D. C. Thomas K. Taylor, assistant to the chairman of the board, has been elected assistant vice president of the airline.

### Honors and Elections

Charles F. Nielson, director of parts and service for Lockheed Aircraft Corp., has been elected president of the National Defense Transportation Assn. Another new member of the association is James W. Austin of Capital Airlines.

## INDUSTRY OBSERVER

► Some more airline deals are cooking for purchase of Douglas Super DC-3s. United Air Lines reportedly has been studying plans to buy a large fleet of the Super-3s as its twin-engine replacements. However the recently announced United purchase of additional DC-6Bs may mean a slowdown or a halt for the Super-3 deal.

► Slowdown of the beginning of the flight test program for the new Goodyear N-type Navy blimp prototype is attributed to difficulties with the extension shafts. These run from the powerplants, which are in the gondola for inflight maintenance accessibility, out to the propellers, in neatly streamlined outboard nacelles.

► Following first five hours of preliminary flight tests by North American test pilots, Air Force pilots have taken over the testing of the first Avro Orenda-powered F-86 sweptwing jet fighter at Edwards AFB, Muroc, Calif. Installation was made by North American. Despite the larger diameter of the Orenda, external dimensions of the airplane were very little changed. On the basis of the improved performance of the plane with the 6500-lb.-thrust Orenda, the Canadian engine probably will be used to power the Canadian-built F-86s which Canadair Ltd. is getting ready to build. It may replace the General Electric J-47, now the standard F-86 powerplant, after about the 25th airplane has been built at Canadair.

► Grumman Aircraft Engineering Corp. is moving some of its Navy fighter and attack plane flight test operations down to Witham Airport near Stuart, Fla., from the home base at Bethpage, Long Island, because of better flying weather, and to overcome overcrowding at Bethpage.

► Stanley Aviation Corp., Buffalo, has its first small order for pilot ejection seats from a manufacturer, Boeing, presumably for the B-47 or XB-52 jet bombers. The Buffalo company has been developing a new pilot ejection seat under Air Force contract for the last year. The Stanley seat ejects the pilot downward through an escape hatch opening at the floor of the cockpit, instead of upward, as most other escape seats do.

► Prototype Boeing Stratocruiser has been purchased by Pan American World Airways, stepping up the airline's Stratocruiser fleet to 29. (PanAm owned 20 before acquiring eight in the purchase of American Overseas Airlines.) The plane was used for Boeing and government testing for type certification and afterwards for developmental testing. Plane was purchased without interior fittings or pressurization, which are to be provided by PanAm.

► Newest projected role for the Lockheed F-94, two-place night fighter developed from the versatile F-80 jet fighter, is as a ground support plane. Air Force and Army are interested in a Lockheed proposal to modify the F-94C to a single-place long-range jet plane, using the space and weight saved for additional fuel tanks. This additional range would take care of the principal objection raised to the F-80's work as an improvised ground support plane in Korea.

► Combined flight time for de Havilland's two Comet jet transports is now approaching the 500-hr. mark. No. 1 Comet had flown 401 hr. and No. 2 Comet 48 hr. as of Oct. 26, the British manufacturer has advised AVIATION WEEK.

► Convair's first turbo prop-powered transport plane, the Turboliner ordered by General Motors Corp. to demonstrate Allison T-38 engines and Aeroproducts turboprops and controls, is nearing completion at San Diego. It is due for a roll-out to start taxiing tests any week now. Delays in getting the second powerplant were a factor in the overall retarded schedule.



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# AVIATION WEEK

VOL. 53, NO. 19

NOVEMBER 6, 1950

## Airlines Face Problem on Spare Parts

**NPA bans civilian production priorities while awaiting word on shortage threat.**

By Alexander McSurely

An acute shortage in airplane spare parts, caused by a clamp-down on non-priority orders, confronts U.S. airlines and foreign airlines which fly American-built planes.

National Production Authority was waiting last week for U.S. airlines and plane manufacturers to show where the shortages are, and for federal aviation agencies to recommend a remedy.

The airline problem of getting spare parts, and the more remote but equally important problem of continuing production on new civilian transport planes, were up against a serious road-block. The block was the announcement by William Henry Harrison, NPA Administrator, that he did not intend to grant any NPA Defense Orders granting priorities to civilian production.

But some Washington observers said that the ban on Defense Orders for civilian production would not last long past Election Day, Tuesday, Nov. 7. **►Sweating It Out**—In any case, the airlines, manufacturers, and the civil aviation agencies, who are charged with the responsibility for protecting aviation's interests were sweating it out, last week.

One airline engineering man describes the situation like this:

"Airline purchasing agents have been notified by their jobbers and manufacturers that they can't get any parts replacements without priorities. This applies to little stuff like nuts and bolts, hydraulic fluids, radio equipment, flight instruments, anything that is company furnished equipment. When you consider that Eastern Airlines alone stocks 30,000 items in its spare parts inventory, you get an idea of what this means.

"And you can't blame the jobbers and parts manufacturers. They can't get many materials to make additional stuff, without defense orders. They are selling themselves out of business if they sell to an airline when the airline doesn't have a DO."

A responsible civil aviation official points out some interesting aspects in the problems of the foreign airlines, up against similar shortages:

"Besides our own airlines' problems, we are up against a serious international situation with the foreign airlines. We can't afford to clamp down on their spare parts supplies. They would immediately interpret it as another competitive step favoring American international airlines, and there is a lot of ill feeling among the other airlines now about the American Overseas-Pan American merger. It would be used against us in any negotiations for reciprocal rights and agreements. Similarly, we can ill afford not to let them get the new American transports they have ordered."

A specialist in aircraft industrial planning sees the manufacturers' problems like this: "What we have to show Mr. Harrison mainly is that the whole problem is pretty much peanuts, dollar wise, compared to the overall national production, and that it won't have any serious effect on the overall materials situation, whether we do or do not get our priorities. But if we don't get them, it will cripple the airlines, and slow up transport production, and the military services don't want that any more than do the airlines and manufacturers."

In Washington last week Aircraft Industries Association and Air Transport Association were getting reports from member manufacturers and airlines on individual company shortages "as of today." Scope of the rush order surveys can be seen from the fact that one company report may contain several hundred short items.

Here are some of the manufacturers' problems being discussed:

- How will a manufacturer continue a mixed production line of part civilian, part Air Force and part Navy transports, all built on the same design, if he can't get materials and purchased parts for the civilian planes?

- Manufacturers by their purchased parts on a mixed inventory basis, 100 landing gear strut sets for 100 planes, regardless of who gets the planes, but the advantages of this quantity buying are lost if he has to buy separately, and let his line lag, because of short supply on his commercial plane parts orders.

NPA officials say that the steel order for railroad box cars at the rate of

## Aluminum Rules

National production authority has announced rules for handling defense orders for aluminum. These will affect the transport plane priority problem discussed in these columns.

NPA Order M-5 provides for a 60-day lead time in scheduling Defense Orders. Aluminum producers and fabricators are not required to accept DOs received less than 60 days before the first day of the month in which shipment is to start.

Primary producers are required to accept rated orders up to 6 and 1/4 percent of the producers monthly scheduled production of primary pig and ingot, from independent fabricators.

Maximum limits on required rated orders in any one month will be based on a percentage of the average monthly shipments during the first eight months of 1950, with the following percentage scale:

- 40 percent—forgings and pressings.
- 35 percent—extrusions and tubing.
- 25 percent—sheet, plate, strip, secondary ingots.
- 20 percent—castings and miscellaneous mill products.
- 15 percent—rolled shapes, rod, bar, wire and cable.

Overall limit of required rated orders in any one month will be 25 percent of average monthly shipments for the first eight months of 1950. And this applies down the line to primary and secondary producers, fabricators, and to distributors and jobbers of aluminum products. Specific NPA directives to individual companies may provide for special production and delivery programs of aluminum products.

100,000 cars a month for three months does not automatically solve the priority problem for boxcars, since other ratings may have to be issued for other materials.

**►What Happens?**—What happens to



manufacturers who have built up a large inventory of unfinished parts and can't get the necessary materials and/or tools to finish them?

These are all problems which are peculiar to the half-out semi-emergency status in which the nation's business finds itself.

Unless the U.S. moves another step into an all-out war emergency production status, the government must make provision for continued civilian production along with its increased military production.

Washington analysts say that a big part of the transport plane and parts priority problem is caused by the fact that the aviation manufacturing industry does not conform to the general pattern on which the NPA regulations have been tailored.

This is because a very large part of the total U.S. aircraft production, pre-Korea, was already military, and because the industry took a disproportionately large share of the military expansion, further dwarfing the civilian aviation production.

Government thinking was based on an expected utilization of about 5 to 10 percent of industry capacity for increased military orders.

But the aviation capacity is utilized about 98 percent for military orders on the new level, analysts report.

Some early shortage pinches are being felt in electronic and electrical equipment.

► **Spotcheck**—An AVIATION WEEK spot-check with one leading engine manufacturer and one leading transport manufacturer brought the following reports:

• **Engines:** The manufacturer (Pratt & Whitney) expects to be able to meet its orders for commercial transport engines.

• **Planes:** The manufacturer (Martin) is running into shortages in extrusions and sheet, but expressed confidence that the priorities problems would be worked out for its continued production of transports for commercial orders already placed. Martin has not yet received any military service orders for 4-0-4s.

Washington industry analysts concluded last week that NPA would probably have to provide some form of Defense Order or directive eventually which would clear the way for the transport planes and spare parts. But it was a cinch that NPA would not go as far as many industry people hoped.

successfully at weights approaching full gross.

Like other composite powered aircraft, the new Navy bomber is designed to rely upon its piston engines, two Pratt & Whitney R-2800s rated at 2300 hp. each for extending its cruising range. It has the additional push from a late model Allison J-33 turbojet rated at 5400 lb. thrust, which it can call upon for speeds of over 400 mph. when needed in combat areas.

Some navy officials say too much importance has been attached to the fact that the AJ-1 has a bomb bay specifically designed for carrying atomic bombs. There are other navy planes which also will pack an A-bomb, but the fact remains that the AJ-1 is undoubtedly the longest range carrier-based atom-bomb-carrying plane. As such, it gives new impetus to carrier aviation, providing an even more formidable carrier strike punch than has been available heretofore.

Soon after the announcement of the carrier tests aboard the Coral Sea, other Navy reports told of another AJ-1 bomber apparently already on operational duty, which plunged off the bow of the USS Franklin D. Roosevelt in a takeoff near Guantanamo, Cuba. First reports said that difficulties with one of the engines during takeoff caused the crash. One of the crew of three was rescued.

The AJ-1s participating in the Coral Sea demonstration were assigned to Composite Squadron 5 at Norfolk NAS and each plane from the Squadron made at least one landing aboard the Coral Sea. In one of the AJ-1 landings, John F. Floberg, Navy Assistant Secretary for Air, rode along during the test as a passenger.

The tricycle gear bomber is fitted with four-blade Hamilton Standard propellers. It folds its outer wing panels inboard, and its vertical tail folds to the right surface of the horizontal stabilizer, for more compact handling aboard carriers. Wingspan unfolded is 65 ft. and fuselage length is 50 ft.



AJ-1 ATTACK BOMBER Navy's latest and heaviest, lands on the USS Coral Sea.

## AJ-1 Gives Navy Increased Punch

North American's piston-plus-jet bomber could carry A-bomb 1200 miles and return to its carrier base.

Navy's newest carrier slugger, the long range North American AJ-1 bomber, is more ready for sea duty than official announcements indicate.

The husky composite-powered bomber, which boosts navy carrier plane radius of action to around 1200 miles, has been officially named the heaviest aircraft to make landings aboard a navy carrier, as a result of landing trials on board the USS Coral Sea, in tests near the Virginia Capes. (The still

heavier Lockheed P2Vs have made carrier takeoffs but never a carrier landing.)

Unofficial reports say that not only has the North American plane landed as reported in virtual weight-empty condition, weighing around 34,000 lb., but that it has made repeated operational takeoffs and landings. These include taking off at its full gross weight well over 50,000 lb. equivalent to full fuel and bomb load condition, and landing

## R&D Command

New AF group at Dayton indicates greater stress on basic research.

Dayton—A renewed emphasis on basic research is expected from the establishment of the new Air Research and Development Command, which will be based at Air Materiel Command here until May 15, 1951, when it will move.

Organization of ARDC means a fundamental change in AMC research activities and emergence of a new term: "support engineering." This term now

is being used to describe the future functions of the research and development people at AMC.

Its definition gives a clue to the reason why research and development has now been made a command job along with comptrolling, personnel, operations and materiel.

► **Support Engineering**—Support engineering, it is explained at AMC, can be defined roughly as "trouble-shooting" on new planes, equipment research into means to lick problems, and modifications dictated by that research. The job itself is not new; That is what AMC's research and development people have been doing for some time. And with the increase of new planes and devices funneling through AMC, less and less time, personnel and resources have been available for basic research and development.

USAF, aware of that situation for some time, last January set up ARDC as a planning unit under Maj. Gen. David M. Schlatter. With ARDC becoming an operating body, Gen. Schlatter now is its commanding general. He sets up shop at AMC within the next few weeks.

AMC will gradually transfer research personnel to the ARDC. Whether AMC will continue to have a directorate named research and development is unknown at this time.

► **Taking Over**—In addition to personnel, ARDC will take over from AMC the electronics work of Watson Laboratories, which is now being moved from Eatontown, N. J. to Griffis AFB, Rome, N. Y. ARDC will also take over the Arnold Engineering Center at Tullahoma, Tenn.

The future of Edwards AFB, Muroc, Calif., is undecided. At present it comes under AMC. Command of Edwards may pass to the ARDC, or Edwards may be operated as an independent flight test center.

ARDC will be concerned solely with research and will not relieve AMC of any of the latter's contract-letting functions. Even research and development contracts will be placed by AMC as in the past.

Because of this, and because of the growth in support engineering work, there will be no decrease in activity or personnel at AMC due to the establishment of ARDC. Little in the way of actual research projects will be undertaken by ARDC during its stay at Wright-Patterson AFB.

Gen. Schlatter will be concerned with selecting his key officers and studying the organization of AMC which probably will serve as a pattern for the organization of ARDC. There is little discussion yet of the location of ARDC's permanent home, but the most likely site is the engineering center at Tullahoma.

## Jet Blade Output Hit by Plant Fire

Allison Engine division of General Motors Corp. and the Air Materiel Command last week were hunting additional sources of supply for jet engine blades after a fire at the Battle Creek, Mich., plant of Eaton Mfg. Co. completely knocked out one of the country's major blade manufacturing facilities.

The Eaton plant was producing compressor blades for J-35 engines under subcontract from Allison. An Allison spokesman said its destruction should have no immediate effect on J-35 production. Allison has other suppliers of the same blades.

Long-range effects, however, were not immediately apparent. Allison was checking its other sources of supply to see if they could make up the missing Eaton production.

Extent of Air Force concern over destruction of the plant was expressed in a statement issued by AMC headquarters at Wright-Patterson AFB:

"The Eaton Mfg. Co. is a supplier of important parts for jet engines to Air Force contractors. The loss of the Eaton plant by fire is detrimental to Air Force production. Fortunately, other manufacturers currently are manufacturing the same parts, thus minimizing the effects of the fire on Air Force production. Investigation is now under way to determine the exact effect, if any, the fire will have on our production program."

The statement also said that the other suppliers of blades were being asked if they could increase their production to cover the loss at Eaton.

## AMC Tells How to Do Business With AF

Dayton—The Air Materiel Command, in conjunction with the Dayton Chamber of Commerce, has taken another step to make it simpler to do business with the Air Force at Wright-Patterson Air Force base.

AMC and the Chamber last week inaugurated a series of meetings to discuss the problems of manufacturers' representatives in Dayton and the many businessmen who visit the Field seeking government contracts.

Nearly 200 representatives and manufacturers attend the first meeting, held in the Baltimore hotel. The conference was organized by the Manufacturers' Representatives committee of the Dayton Chamber.

Since the stepped-up procurement program resulting from the Korean war, the number of daily visitors to the Contractors Relations Office at AMC has increased more than four times. Maj.

Gen. O. R. Cook, Chief of Procurement, gave last week's meeting a simple explanation: \$5 billion, or about 56 percent, of USAF's fiscal 1951 appropriation will be spent by the Air Materiel Command.

Importance of the series of meetings, which began last week, is this: Many manufacturers now are visiting the Field for the first time or are setting up representation at Dayton, and proper procedures for working with AMC are vague to them. Because AMC has had to change some of its former procedures to accommodate the greater number of visitors, even some experienced representatives here are running into problems they had not encountered before.

At the first meeting, Gen. Cook answered more than a dozen questions on basic procedures that had been submitted in advance by manufacturers' representatives or small business men. The meetings are open to all persons interested in doing business with AMC, and notification of the dates of future meetings may be obtained from the Dayton Chamber of Commerce, Biltmore Hotel, Dayton, Ohio.

## Chase Starts Move to Birmingham Plant

Chase Aircraft Co., Trenton, N. J., has begun moving facilities and personnel to Birmingham, Ala., to begin tooling up for production of the XC-123 assault transport, company President Michael J. Stroukoff said this week.

Stroukoff's announcement followed an earlier AVIATION WEEK story that the company would move to the former Bechtel-McCone-Parsons plant at Birmingham. Company officials are now at Air Materiel Command headquarters, Wright-Patterson AFB, ironing out paper work problems in connection with scheduled production of both the YC-122C and XC-123 assault transports.

Winner of the recently conducted USAF assault transport evaluation competition (AVIATION WEEK Oct. 23), the company plans to maintain production of the YC-122C transport at its present West Trenton facility.

Transition of the XC-123 facilities from Trenton to Birmingham is expected to be completed before the end of the year. Mr. Stroukoff is reported to have told Birmingham City officials that establishment of the Chase Company in that city would bring an eventual \$52 million dollar-a-year payroll to the city.

## NOT REPUBLIC

Three F-86s involved in a recent accident near Washington were incorrectly identified as Republic jet fighters in some copies of AVIATION WEEK, Oct. 30. North American Aviation makes the F-86.



## Washington Roundup

### R&D Boom

A boom in research and development will get underway with the new supplemental Defense Bill which will go up to Congress when it reconvenes this month. Plans now call for:

- A 78 percent step up in the Air Force's program. USAF now has approximately \$190 million available for research and development projects this year.
- A 40 percent increase in Bureau of Aeronautics' program. BuAer now has \$93 million for this year.
- NACA is working on supplementary estimates to carry the heavy load of military business. NACA wind tunnels have only been operated a few hours a week. Some facilities will have to be kept in continuous operation under the stepped-up program.

USAF's Maj. Gen. Donald Putt commented: "After the outbreak in Korea, we took care of the first necessity first and built up our forces. Now we are going to assure that technology keeps pace". In the 1952 fiscal year, BuAer will "about double" its program and there will be a substantial increase in USAF's research and development program.

### Air Guerillas

USAF will put new emphasis on techniques for guerilla fighting—aerial observation, illumination, detection of night movements, equipment for small aircraft—in its development work, applying experience from Korea.

### National Science Foundation

A science foundation of 24 outstanding scientists will be named by the White House shortly, and prepare to launch a multi-million dollar basic research program—with emphasis on defense—early next year. The foundation will collaborate closely with Air Force, Navy, and NACA.

### Missiles Proving Ground

Long range guided missiles proving ground based in the Banana River area in Florida, will be pushed to early completion by USAF. Its total estimated cost is \$75 million. USAF spent \$5 million on the installation last year, and so far has received only \$6 million for this year.

### Wind Tunnels

NACA is ready to launch construction on its \$27 million eight-foot tunnel at Ames Laboratory and \$20 million four-foot tunnel at Langley Laboratory. Bids for electrical equipment for the drive system—approximately 40 percent of the cost of a tunnel—have been invited for the Ames Installation. Bids for the drive system for the Langley Tunnel will be invited shortly. Design work will go on for some time on the new eight-foot engine tunnel for Lewis Laboratory. NACA has \$75 million for the three supersonic tunnels, anticipates it will take three to five years to complete them.

### No DOs

There will be no defense orders for civil aircraft. William Harrison, administrator of the national production

authority, flatly stated at a closed door meeting with representatives of all branches of civil aviation, concerned over parts shortages. NPA will rigidly stick to its policy of defense orders for military business only—until and when it might be necessary to shackle the whole economy with controls. But NPA's cooperative attitude has civil aviation representatives satisfied that a voluntary plan can be worked out.

### Lightplane Rush

Fixed base operators report they are hard pressed meeting demands for executive aircraft such as Beech Bonanzas and Ryan Navions.

### Prototype Testing

CAA will ask for funds to start the five year \$12.5 million program for testing new types of commercial planes soon. Air Coordinating Committee will decide what planes are to be tested under the program. It will be administered by CAA's office of Aviation Safety, headed by E. S. Hensley.

### CAA Militarization

The proposal to put the airways operating personnel of CAA into uniform in an emergency is sleeping at the Budget Bureau—but it isn't dead. Some NSRB officials view it as a "must" for effective mobilization. They claim joint military-civilian jurisdiction over air movements won't work.

### CAA Pilot Training

Aeronautical Training Society is cool to legislation setting up a \$150 million pilot training program under the CAA, introduced a few days before Congress recessed, by Sen Edwin Johnson and Rep. Robertcrosser. National Aviation Trades Association and Aviation Services, recently organized with Kendell Hoyt as Washington representative, will push the proposal. ATS members would rather contract directly with the Navy and Air Force.

### Air School Probe

Aviation schools welcome the coming investigation of GI training by a special House Committee headed by Texas Rep. Olin Teague. They feel they will come out on top and that Veterans' Administration red-tape will show up in a poor light. Hearings are due to start in December.

### Separation Study

Langdon Marvin, Jr., a longtime dabbler in air transport matters on Capital Hill, was behind the low \$70,000 bid submitted by Georgetown University for the contract with Senate Interstate and Foreign Commerce Committee to make a study of separation of airmail pay from subsidy. He is on the research staff of the University. The bid was rejected because it didn't meet the specifications laid down in the invitation by Chairman Edwin Johnson.



BELL YH-12B, biggest copter built by Buffalo company, is one of 13 delivered to USAF. The capacious cabin can store . . .



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## Bell's Big YH-12B Put Through Paces

These are the first views of the big Bell YH-12B 10-place-plus-pilot helicopter, 13 of which were built for the USAF.

The YH-12B is powered by a P&W R-1340 Wasp of 600 hp. which gives the craft a top speed of over 120 mph. and a cruising speed of 85. Range with normal fuel load is 500 mi. Rate of climb is 900 fpm.

Rotor diameter is 47.5 ft. and fuselage is 39.55 ft. long. Quickly removable double doors measure 50 x 49 in., with the cargo compartment measuring 4 x 7 x 3.5 ft. A supplementary baggage hold is 3 x 4 x 2 ft.

Some modifications from the prototype XH-12 are noticeable, primarily in the fuselage and landing gear.

EIGHT SOLDIERS, fully equipped, plus the pilot, are easily carried in the big Bell.





## PRODUCTION



INITIAL PRODUCTION batch of Northrop Scorpion fighters at Hawthorne prior to test.

## F-89s May Put Northrop in Black

Scorpion orders represent firm's best deal since World War II; company busy also in other fields.

The sleek, long-nosed twin-jet Scorpion all-weather fighters rolling off Northrop Aircraft's Hawthorne, Calif., production lines are the company's hope to turn out a favorable balance sheet in the coming fiscal year. F-89 orders are the largest the company has worked on since the close of World War II.

In total number of planes involved (112 before Korean hostilities plus a large undisclosed number afterward), the F-89 is the biggest and most promising deal the company has closed since the end of World War II. Initial orders were negotiated on a cost-plus-fixed-fee basis, an unusual procedure, but necessary because the plane is a new type rushed into production under USAF order without working out a preliminary contract. Thus neither Northrop or USAF had enough experience to arrive at the usual pricing formula.

The first 15 Scorpions are scheduled for highly accelerated service and tactical suitability trials; the outcome will permit the Air Force to work out a stabilized production program for the type.

Part of Northrop's deficit last year (\$44,973.71) was due to lack of additional military programming on the C-125 Raider transport. Northrop entered in a contract for 23 of these assault-Arctic rescue trimotors with expectation of further orders. This prospect didn't materialize and the company has already written off the total anticipated loss.

► **Other Activities**—A new candidate for Northrop's Special Products division is a company-developed compact digital differential analyzer called Maddida ca-

pable of fitting alongside an ordinary office desk.

Established this year was the Dy-Chek Co. to market a dye penetrant inspection method for detection of flaws. Northrop physicists are working in the Nuclear Energy for Propulsion of Aircraft (NEPA) project using a new mathematical procedure, dubbed the "Monte Carlo" method, to evaluate means of shielding occupants of an atom-powered plane from harmful radiation.

Company personnel have been boosted to 5250 and facilities cover about 1,461,490 sq. ft. of covered area. Northrop is utilizing International Airport, Ontario, for flight testing production F-89s. Here it leases 30,000 sq. ft. of covered area and 225,000 sq. ft. of uncovered area.

## AF Invitations

Bids openings are 20-30 days after approximate issue dates shown in the following bid proposals. Bid sets containing specifications for items to be procured will be sent to qualified applicants who state bid invitation number.

One bid set will be available for examination without obligation by prospective bidders, after bid publication date, at each of the seven AMC procurement field offices. This will enable firms to see specifications before writing or telegraphing for their own bid sets.

Procurement field office locations: Boston Army Base, Boston 10, Mass.; Government Aircraft Plant No. 4, Ft. Worth 1, Tex.; 39 S. LaSalle St., Chicago 3; Wright-Patterson AFB, Dayton, Ohio; West Warren and Longo Aves., Detroit 32; 155 W. Washington Blvd., Los Angeles; 67 Broad St., N. Y. 4.

### INVITATIONS

**Connector-plug**, 1-30 items, bid invitation No. 51-894, issue date 30 Oct., delivery to start within 45 days, complete within 75 days.

**Cable**, 130,000 ft., bid invitation No. 51-896, issue date 30 Oct., delivery complete within 90 days after date of award.

**Bench, work**, 441 each, bid invitation No. 51-900, issue date 30 Oct., delivery to start within 40 days, complete within 120 days.

**Cable**, 1-9 items, bid invitation No. 51-901, issue date 30 Oct., delivery to start within 60 days, complete within 90 days after date of award.

**Hose, aircraft**, 1-9 items, bid invitation No. 51-902, issue date 30 Oct., delivery complete by 31 Dec. 1950.

**Rivet**, 1-76 items, bid invitation No. 51-903, issue date 30 Oct., delivery 50% within 60 days, complete within 120 days.

**Aircraft hardware, Class 04**, 1-34 items, bid invitation No. 51-906, issue date 30 Oct., delivery complete within 120 days after date of award.

**Insulator**, 1-24 items, bid invitation No. 51-907, issue date 30 Oct., delivery to start within 45 days, complete in 120 days.

**Container**, 15,000 each, bid invitation No. 51-908, issue date 30 Oct., delivery complete within 60 days after date of award.

**Compound, cleaning**, 340,600 lb., bid invitation No. 51-909, issue date 30 Oct., delivery to start within 30 days, complete in 90 days.

**Gasket, and packing**, 1-45 items, bid invitation No. 51-910, issue date 30 Oct., delivery complete within 120 days after date of award.

**Gage, pressure**, 1-14 items, bid invitation No. 51-913, issue date 30 Oct., delivery within 90 days after date of award.

**Chemicals, Cl. 24**, 1-4 items, bid invitation No. 51-914, issue date 30 Oct., delivery to start within 30 days, complete within 90 days.

**Can, film storage**, 14,128 each, bid invitation No. 51-928, issue date 31 Oct., delivery within 2 months after date of award.

**Connector, plug**, 1-6 items, bid invitation No. 51-930, issue date 31 Oct., delivery within 60 days after date of award.

**Cooling cabinet**, 25 each, bid invitation No. 51-933, issue date 31 Oct., delivery within 90 days from date of order.

**Stand assembly**, 254 each, bid invitation No. 51-934, issue date 31 Oct., delivery within 150 days after date of award.

**Machine, testing**, 4 each, bid invitation No. 51-935, issue date 31 Oct., delivery complete within 90 days after date of award.

**Tester assembly**, 294 each, bid invitation No. 51-936, issue date 31 Oct., delivery complete within 90 days after date of government approval of the first article.

**Tester, Magnesium instrument**, 47 each, bid invitation No. 51-946, issue date 2 Nov., delivery complete within 90 days after date of award.

## PRODUCTION BRIEFING

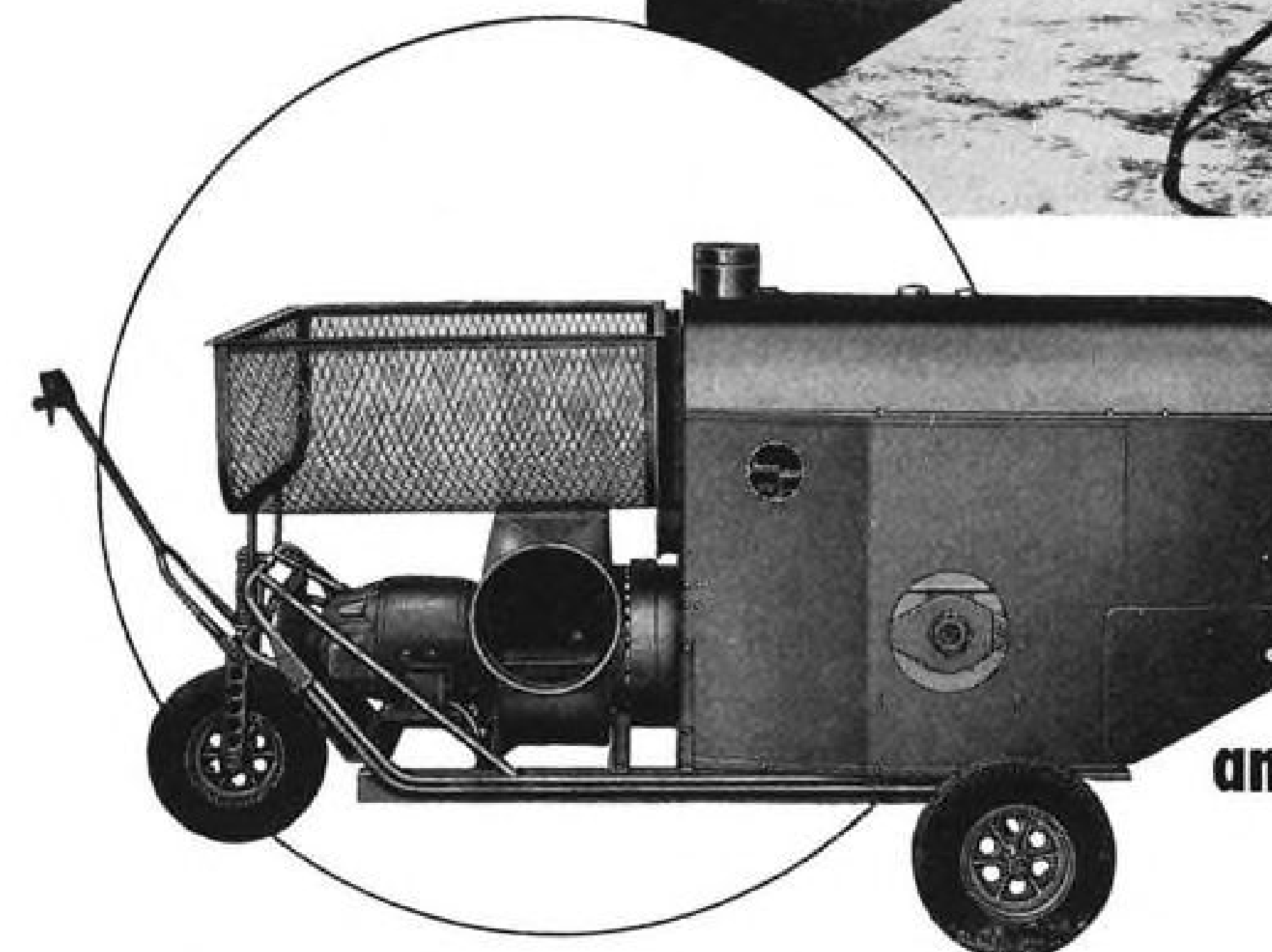
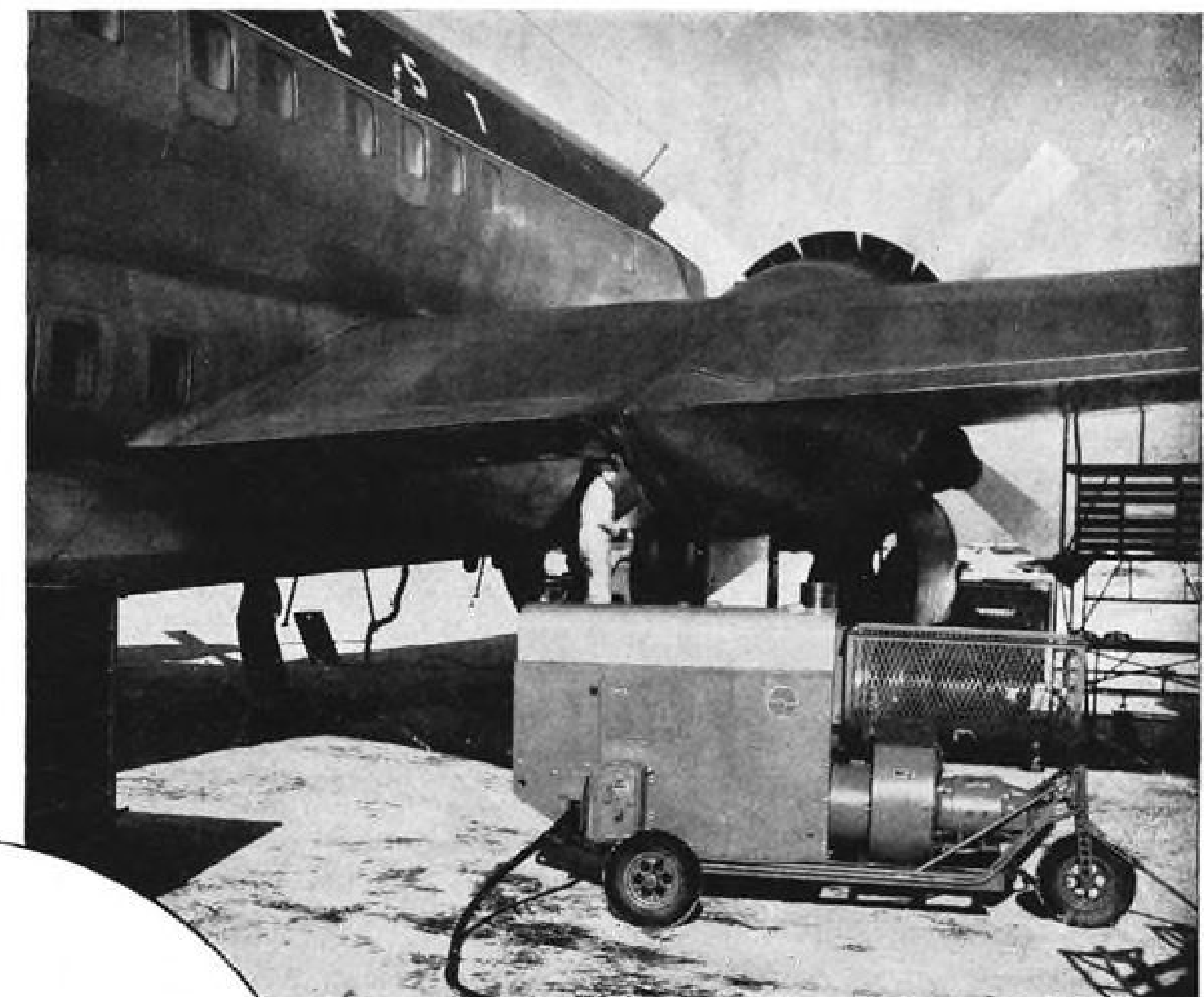
► **Taylorcraft, Inc.**, Beaver County, Pa., is clearing up its private plane backlog to reorganize for defense contracts. The concern is planning to step up employment.

► **Consolidated Vultee** has leased headquarters of Institute of Aeronautical Sciences' San Diego section to handle an expanded flight and field operations program. IAS has closed the building to all public meetings for the duration of the lease.

► **Allison division** of General Motors, Indianapolis, has received two government contracts totaling \$3,531,000 for J-33 turbojet engines.

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WARM CABINS  
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## AERONAUTICAL ENGINEERING



## Viscount to Enter BEA Service in 1953

First certificated turboprop airliner to be built in three versions for varying traffic requirements.

By David A. Anderton

Some last-minute effort by Vickers-Armstrongs, Ltd. got their Viscount 700 built and flown in time for the recent Society of British Aircraft Constructors display at Farnborough, England. First flown on Aug. 28, the 700 managed to acquire the necessary ten hours of flight time before the display opened Sept. 5.

It appeared at the Farnborough show in the scarlet and white markings of British European Airways, for which it will fly beginning sometime in 1952. By spring of 1953, the Viscount—incidentally the first turbine-engined civil aircraft to be granted a certificate of airworthiness—will be in scheduled operations for BEA.

► **Viking Follow-Up**—The Viscount 700 series, classed as a medium-sized transport, was intended as a successor to the Vickers Viking.

There are currently three subtypes described by Vickers:

- Type 701, a 40-seater with a three-man flight crew.
- Type 702A, a 40-seater with a two-man flight crew and additional freight space.
- Type 703, a 53-seater for high-density tourist traffic.

The Viscount 700 which was on display at Farnborough was basically fitted out like the Type 701; it might be considered as a pre-production airplane of

that subtype. It also differs considerably from its predecessor, the prototype Viscount 630.

Basic changes from the 630 include a fuselage lengthened by 80 in., increased wingspan (by increasing the center section dimensions between the inboard nacelles) and a larger dorsal fin.

► **Dimensional Data**—Closest American counterparts to the Viscount in physical dimensions and weights are the Martin 2-0-2 and the Convair 240.

Viscount's wing span is 94 ft.; its fuselage measures 81 ft. 2 in. long. Its maximum takeoff weight is pegged at 50,000 lb.; for landings, this must be reduced to 47,500 lb.

Corresponding wing loadings are moderate—51.9 psf. at take off and 49.4 for landings.

Chief novelty of the Viscount is the turboprop installation. Four Rolls-Royce Dart engines are mounted well ahead of the wing structure in one of the most beautiful powerplant installations to be seen today.

Each Dart develops 1400 shaft hp, plus an additional 365 lb. of jet thrust. Rotol props of 10-ft. diameter are fitted; they are four-bladed, constant-speed and fully feathering.

► **Inside the Viscount**—Pilot and co-pilot positions are on a flight deck at the same level as the main cabin floor. They face a clean instrument installation with everything below windshield

level, eliminating the overhead panels which do so much to clutter a cockpit. Handwheel control shaft passes through the panel to the main control column mounted forward of the instrument panel. This feature means much more leg room for both officers.

Engine controls are mounted on a pedestal between the seats; landing gear, flap and trim tab controls are also fitted on the pedestal.

Visibility has been given careful design consideration in the cockpit. Line-of-sight over the nose is 25 deg. down from the horizontal, increasing to 33 deg. ahead of each officer. Side vision is 39 deg. up and 41 deg. down from each flying position.

In the 701 and 703 Viscount, the radio operator has a position immediately behind the co-pilot, but facing aft. Storage space is provided for a full range of radio installations, plus blind flying and navigational aids.

This equipment is remote-controlled by the co-pilot in the 702A, which does not carry a radio operator.

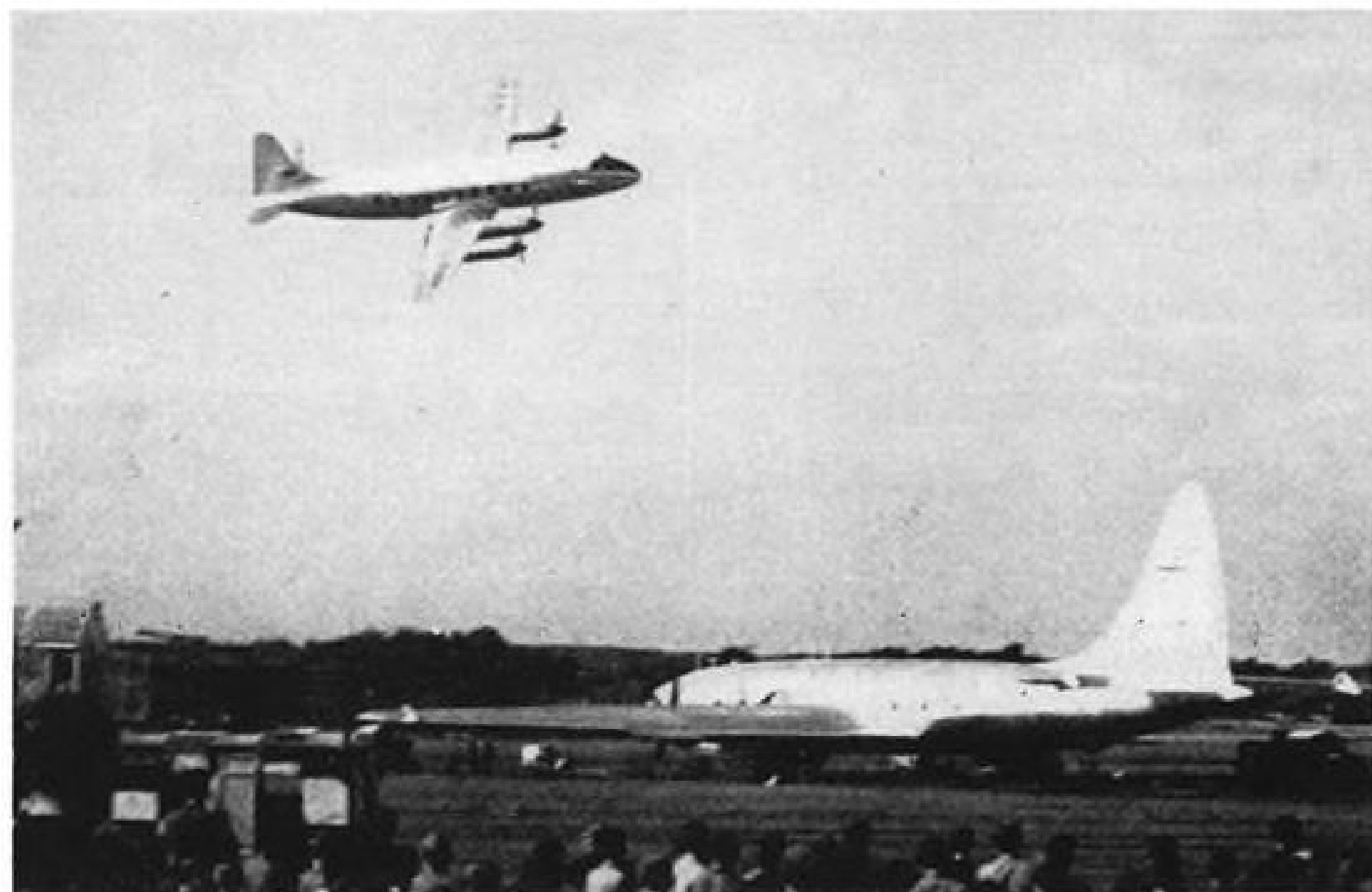
A door on the port side of the fuselage just aft of the flight deck provides access for the flight crew.

► **Food and Freight**—Between the flight deck and the main cabin there is a fuselage bay which provides freight space and a galley.

In the 701, the forward freight space is 95 cu. ft.; in the 702A, this is increased to 105 cu. ft., with further increase to 118 cu. ft. in the 703.

The galley is fitted with the necessary equipment for serving hot meals, light refreshments and drinks.

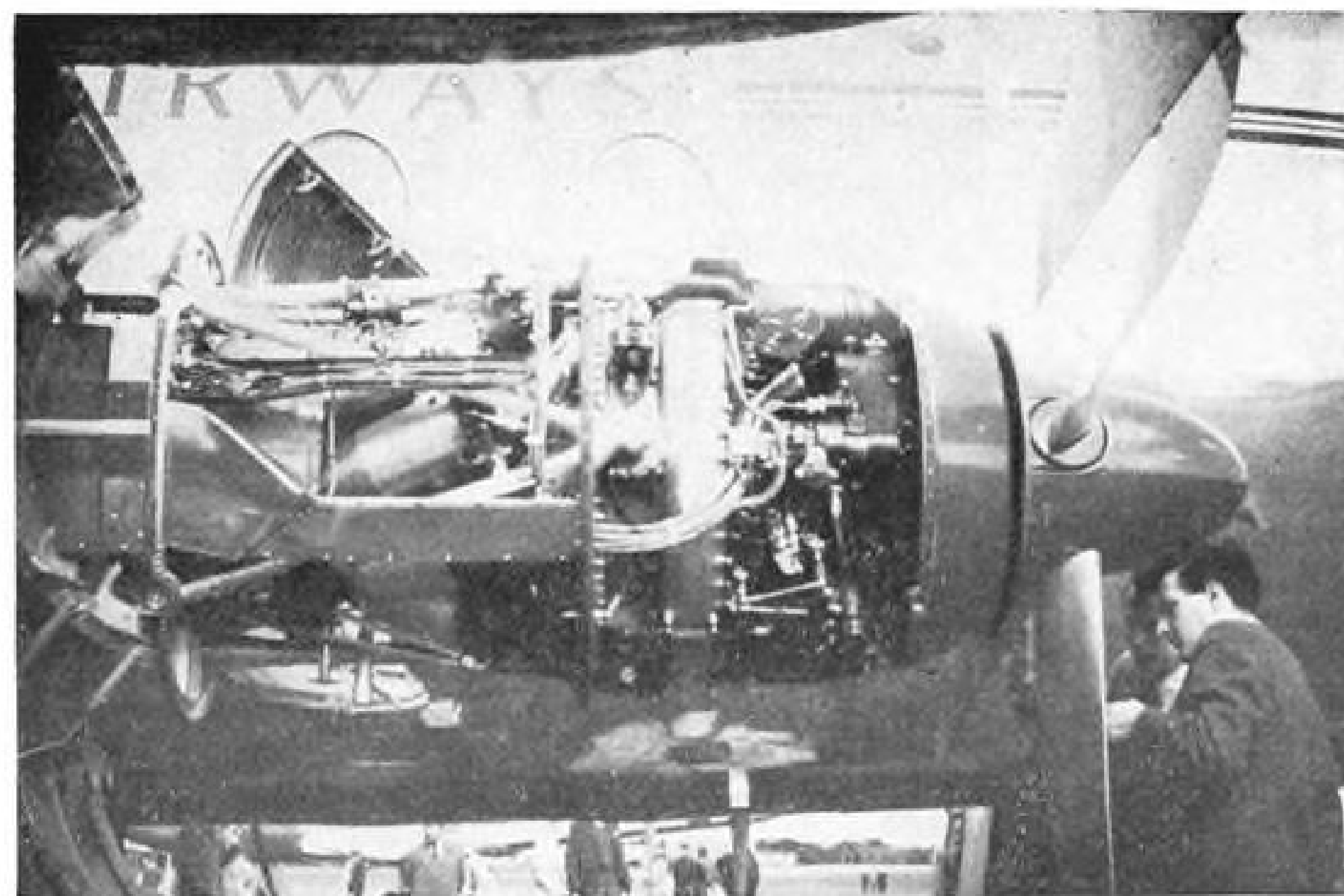




VISCOUNT 700 banks over the crowd at the 1950 SBAC Farnborough display, showing...



DORSAL FIN and dimensional changes from earlier prototype 630. Power units are...



ROLLS-ROYCE Dart RDa3 turboprop engines, shown with petal cowling peeled back.

Galley supplies and freight are loaded through the same door used by the flight crew.

► **Main Cabin**—The interior layout of both 701 and 702A is identical. Forty seats are arranged in ten rows of two-aisle-two; the forward pair faces aft, but all others face forward.

The 703 Viscount arranges its 53 seats in nine rows of two-aisle-three, and four rows of two-aisle-two. All seats face forward except those of the first row.

In the Viscount shown at Farnborough, the immediate impression on entering the cabin (through a door at the rear) was one of roominess. There were two contributing factors to that impression: the upholstery and wall coverings were light grey, with a minimum of breaking-up with other colors or attempts at decor; and the windows are huge—19 x 26 in.—ellipses, with the major axis vertical.

In the event of emergency, each window can be pulled in for escape.

Full cabin air conditioning, without recirculation, is used. It maintains an interior pressure altitude of 5000 ft. up to the 25,000-ft. outside pressure altitude level.

In all subtypes of the Viscount, the toilet compartment and the cabin entrance door are at the rear of the cabin.

► **Baggage and More Freight**—A second cabin freight compartment is located behind the main cabin, with access through a separate door on the starboard side of the fuselage. Size of this bay is 155 cu. ft. in all subtypes.

An underfloor freight hold of 190 cu. ft. capacity is reached through two loading hatches on the starboard side of the fuselage.

As a safety measure, this lower hold is boxed in with a sheet metal wall to isolate it from the surrounding structure. There is also provision for getting into the hold during flight.

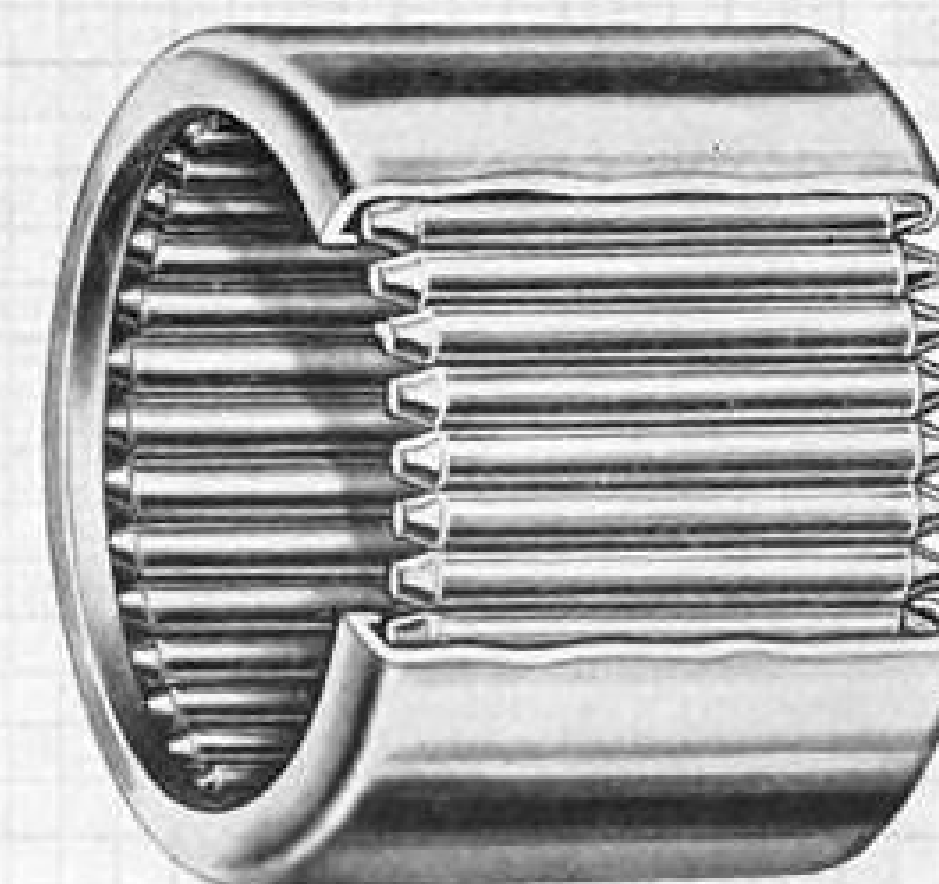
► **Dart Power Units**—Each Dart RDa3 engine is mounted, as part of the entire powerplant installation, to the wing structure. Four bolts are used, facilitating rapid removal of the power unit if necessary.

The engine is closed-in with petal-type cowling, retained in the open position with shock-absorbing anchorages and in the closed position with locks.

Firewalls divide the installation into three bays, segregating the hot parts—combustion cans and turbine—from the cold compressor and main accessories. Jet pipe is shrouded; local structure and all electrical leads are heat-protected.

The air intake is circular, and has an annular duct leading to the first-stage compressor. Around the intake and integral with the casing, is the oil tank. The lubrication system is thus self-contained, with some inlet de-icing effect supplied from the warm oil. A second

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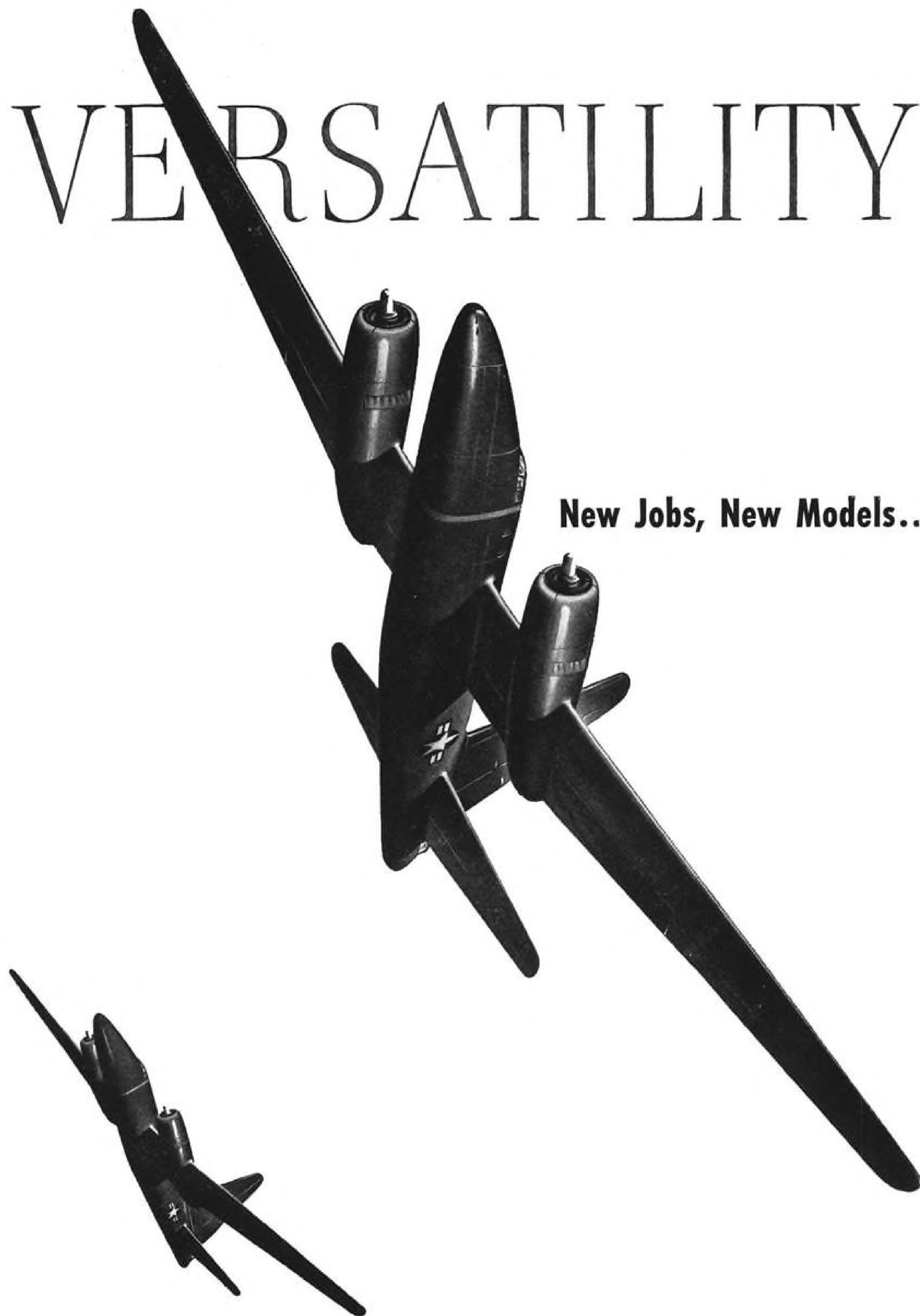
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# VERSATILITY

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## ..The Navy's P2V

Like other Lockheed aircraft, the Navy's powerful P2V Patrol Bomber, the Neptune, is today far more versatile than its original prototype. The physical changes that this plane has undergone are so advanced they are secret, but the proved achievement of the P2V series is a matter of record.

The P2V holds the world's longest non-refueling, non-stop flight record of 11,236 miles—from Perth, Australia, to Columbus, Ohio.

It is the largest airplane to take off from an aircraft carrier.

A squadron of Navy P2V's flew 691 hours photographing the Arctic in an unprecedented aerial survey. They took more than 120,000 separate pictures.

P2V's in the Arctic have operated successfully in extremely adverse cold weather, as cold as  $-42^{\circ}\text{F}$ .

Neptunes are currently engaged in vital operations in the Pacific area.

Long in quantity production, the Neptune provides the Navy with a patrol bomber designed for many jobs: anti-submarine warfare, all-weather reconnaissance, including hurricane patrol, long-range photo reconnaissance, air search and rescue, special carrier-launched missions.

*Lockheed  
Aircraft Corp.*

Burbank California

concentric air inlet supplies cooling air for the engine oil cooler.

Nine tanks in each wing carry the main fuel supply of 2065 gal. (1720 imp. gal.). The tanks are of the crashproof bag type, and are interconnected. They can be replaced through local access panels.

For high-temperature areas, 75 gal. of water-methanol are carried for about three minutes of extra-power operation.

► **No Ice**—Thermal de-icing is used on wings and tail surfaces. Air is passed through heat exchangers whose hot side is the engine exhaust, and then routed through ducting to the appropriate surface. Venting is through louvers in the surface. Engine air intake is also de-iced.

Prop blades are electrically de-iced by thermal units embedded in the blades. Four special generators of 12-kw. capacity are used.

Windshield is de-iced with fluid sprayed from tubes ahead of each pilot's position. Sufficient capacity is provided for 2½ hours of bad weather operation. Electrically operated windshield wipers are used to distribute the liquid.

► **Design for Maintenance**—Vickers-Armstrongs says that maintenance has been a prime consideration in the design of the Viscount. The greatest attention has been paid to the electrical systems because of their heavy use throughout the aircraft. Circuit groups are isolated with heavy-duty, thermal circuit breakers, so that repairs can be made with the rest of the circuitry in use. All cockpit equipment is grouped on hinged panels; all power distribution equipment is centered around the servicing hatch in the hold.

All components of the cabin air conditioning system—except the spill valves—are grouped together in the fuselage belly near a convenient hatch.

Batteries are mounted on rails and can be run forward on them to the same hatch used to service the electrical power equipment.

Special large access panels are provided for flap gear box and motor, flap gear on the wings and nacelle auxiliary gearbox and accessories. Nine panels provide for the replacement or removal of the fuel tanks, and there are a myriad of other panels in wings and tail for fuel pumps, hinges, controls, piping and hardware.

► **Rapid Turnaround**—The only passenger entrance is at the cabin rear. During stops, galley supplies are taken on through the forward crew door, along with any baggage for the forward compartment. Freight is loaded into the aft compartment through the right-hand fuselage door. Both of these floor-level freight bays can be loaded with fork lift trucks. Baggage can be lifted into the under-floor bays.

Pressure refueling is done at two points on the wing undersurface, and a complete refill of tanks can be accomplished in ten minutes.

► **Flight Plan**—As an example of the Viscount's performance, consider a stage length of 1100 mi.—equivalent to the New York-Miami run.

The airplane starts at a gross weight of 50,000 lb. with a crew of three and 40 passengers.

• **Start and taxi:** Variable time and speed, fuel consumption 20.4 gal.

• **Climb to 25,000 ft.:** Time consumed, 28 min.; ground distance covered, 104 mi.; fuel burned, 217 gal.

• **Cruiseout at 25,000 ft.:** Power setting, 68 percent sea level power; true air speed, 317 mph.; fuel burned, 920 gal.; distance covered, 887 mi.; time consumed, 2 hr. 48 min.

• **Lakedown:** Time consumed, 16½ min.; distance covered, 84 mi.; fuel burned, 64.1 gal.

• **Holding:** Up to 50 min. on two engines at 5000 ft.; fuel burned, 188 gal.

• **Diversion:** To a 230-mi.-distant alternate at cruise altitude of 25,000 ft.; fuel burned, 220 gal.

• **Landing:** Time consumed, 10 min.; fuel burned, 52 gal.

For this entirely hypothetical flight plan, the fuel consumption has totaled 1681 gal. out of the 2065 gal. capacity. And this has assumed that, at the beginning of lakedown, the plane is diverted to the alternate field, at which point it has held for 50 min. in the stack.

Total time for the trip has been 5 hr. 17 min. from takeoff to landing. If the plane had not gone to the alternate and been forced to hold, the trip time would have been 3 hr. and 43 min., which with ground time at both ends of the run would approximate 4 hr. total.

► **Economics**—Such an analysis as this is never complete without some discussion of the economics involved. Actually, determining costs for operation of the Viscount is the individual problem of each user or prospective customer.

The Society of British Aircraft Constructors has developed a standard method of assessing costs of operation of airliners, based on certain assumptions, which at least compares all planes on the same basis. For that formula, the cost of operating the Viscount varies from 15 to 25 pence per ton mile. This, of course, applies only in sterling areas, and has probably been derived on a par with British European Airways evaluations of operational cost.

Prime cost of airframe, power plants and propellers is given by Vickers-Armstrongs with the appended note that they are assumed and for calculation purposes only. However, they should furnish some indication of the final cost of the Viscount.



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The XF91 is one of the many Navy and Air Force fighters that advantageously employ Aerotec's policy of designing a specific control for each individual problem.

Whether the application calls for float switches, valves, diaphragm or bellows pressure switches, Aerotec's representatives throughout the country, specially picked for their knowledge of the aircraft industry, are ready to offer assistance on any automatic aircraft control problem you may have.

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Converted to dollars, these figures are:

- Airframe: \$370,000.
- Powerplants: \$89,700.
- Propellers: \$14,000.
- Total: \$473,700.

► **Certificated**—The Viscount prototype holds the ICAO A category certificate, but the production model has yet to complete the tests required for certification by Britain's Air Registration Board. Once it has done this, it will also be acceptable in this country under the terms of a recently concluded agreement between CAA and Ministry of Civil Aviation.

BEA's Viscount fleet will not get into service until the spring of 1953, which means that early deliveries of the Viscount will all go to BEA. In all probability, foreign operators will not be able to buy any Vincents until after 1952. And by that time, Convair's Turboliner might—just might—be available.

In that event, the Viscount would have some real competition, in a field where it now stands alone.

## All-Weather Docks For B-36 Work

Three all-weather service docks that recently were constructed at Consolidated Vultee Aircraft Corp.'s Fort Worth plant have proven to be so adaptable for work on B-36s, that the company has begun erecting additional units.

The docks are piped for compressed air, wired for electricity and have built-in floodlights. The structure is comprised of four sections, each 36 ft. deep, 30 ft. long, and encloses 60 ft. of each wing. This affords coverage for all engines and permits powerplant and wing work, regardless of outside conditions, mobile heating units insuring comfortable temperature in cold weather.

The dock has two levels, with removable railing sections to facilitate movements of components.

The front section is left open so that there is no obstruction as the plane's wing is accommodated.

Once in place, the docks are lifted from the moving dollies and rest on adjustable screws legs to compensate for uneven terrain.

Convair is planning two types of docks for future use. One version will be a permanent structure erected on the ramp in front of the factory so that B-36s can be moved in for final operations. The second type will be a mobile unit for spotting where needed.

It's estimated that it will take only about 15 min. to withdraw the huge plane from the permanent structure, and approximately 30 min. to free the mobile type dock from the craft.



The Eclipse-Pioneer Generator System features a complete array of fault protective functions, such as selective over-voltage protection, generator and feeder ground fault protection, and reverse current back-up protection, in addition to providing such normal control functions as automatic connect and disconnect of the generator and bus, and automatic voltage regulating and paralleling. In the Eclipse-Pioneer system, component breakdown is such that *any or all of its features may be incorporated into any existing system*—maintenance, trouble-shooting and reserve stock problems are greatly simplified as compared to the "all-in-one package" type of system. For more information on this Eclipse-Pioneer development, write the factory direct.

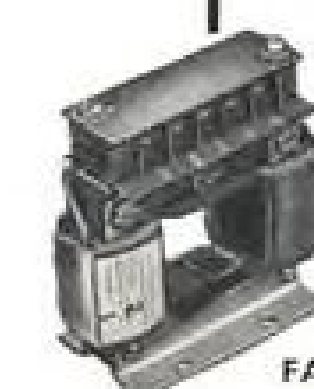
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MAIN BREAKER



FAULT DETECTION UNIT  
(Reactor Type)

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- The main circuit breaker opens the generator feeder under all fault conditions before the reverse current relay opens.
- Provides back-up protection of reverse current relay.

- All functions of a field circuit breaker are incorporated in the main circuit breaker, thereby eliminating use of a separate field breaker.
- Complete and selective over-voltage protection is obtained by sensing generator output.
- The system will detect feeder faults as low as 20 amperes by use of a-c reactors, or 100 amperes by use of d-c shunts, in a very short time interval.

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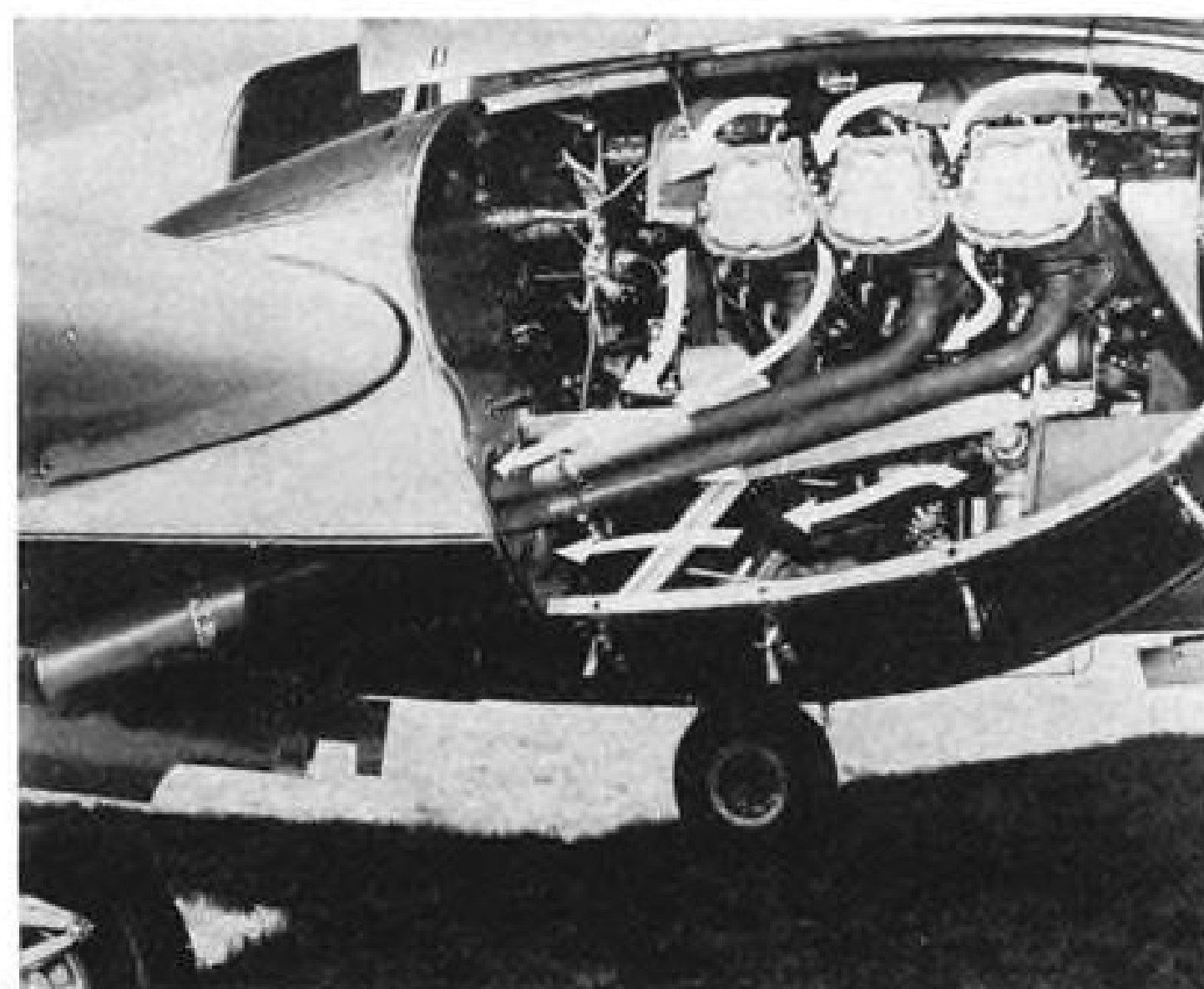


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**TWIN BONANZA** multipurpose craft is designed for easy modification into trainer, photographic plane, ambulance or cargo ship. Outer wing panels have same geometry as Bonanza wing. The roomy cabin will accommodate six.



**EXHAUST** augmentors, arrows showing cooling flow. Engine is Lycoming six-cylinder, geared GO-435-C2.



**FUELING** is easily accomplished through the wing leading edge from ground position or on low stand.

## Design Details of Beech Twin Bonanza

New craft, powered by 260-hp. Lycoming, intended for multi-service role. Maintenance access stressed.

By Irving Stone

Versatility, high performance and ruggedness are teamed in Beech Aircraft Corp.'s Twin Bonanza—newest of the dual-engine light transports to enter the U. S. market.

This 5500-lb. gross, tricycle gear, low-wing craft will seat six (two rows each accommodating three side-by-side) and incorporates twin engines for that extra reliability desired by many operators. And the plane is designed for easy modification into a trainer, ambulance, cargo or camera craft.

Based on a military load of 5095 lb. (half fuel load), it is slated to cruise at 191 mph. at 65-percent power at 10,000 ft., climb 1650 fpm. at sea level, and land with flaps and gear down at

59.2 mph. Service ceiling is 20,400 ft.

The long nose section is strengthened for crash absorption, and cabin floor and keel are reinforced. In a gear-up landing, there is more than 3 in. between the ground and the partially protruding nose wheel if the set-down is in a nose-down attitude; and more than 2 in. clearance between ground and main gear in a tail-down attitude.

Structure is tested to an 8G flight load factor. Safety belt anchors are designed for 25Gs.

► **Cabin, Baggage Details**—Spacing between front and rear seats is 39 in. Front seat width is 54 in., rear 52 in.

Each side of the soundproofed cabin has two large windows that partially extend into the top of the fuselage. Rear

windows may be opened and are releasable for emergency exit. Pilot's side window has a clearview panel.

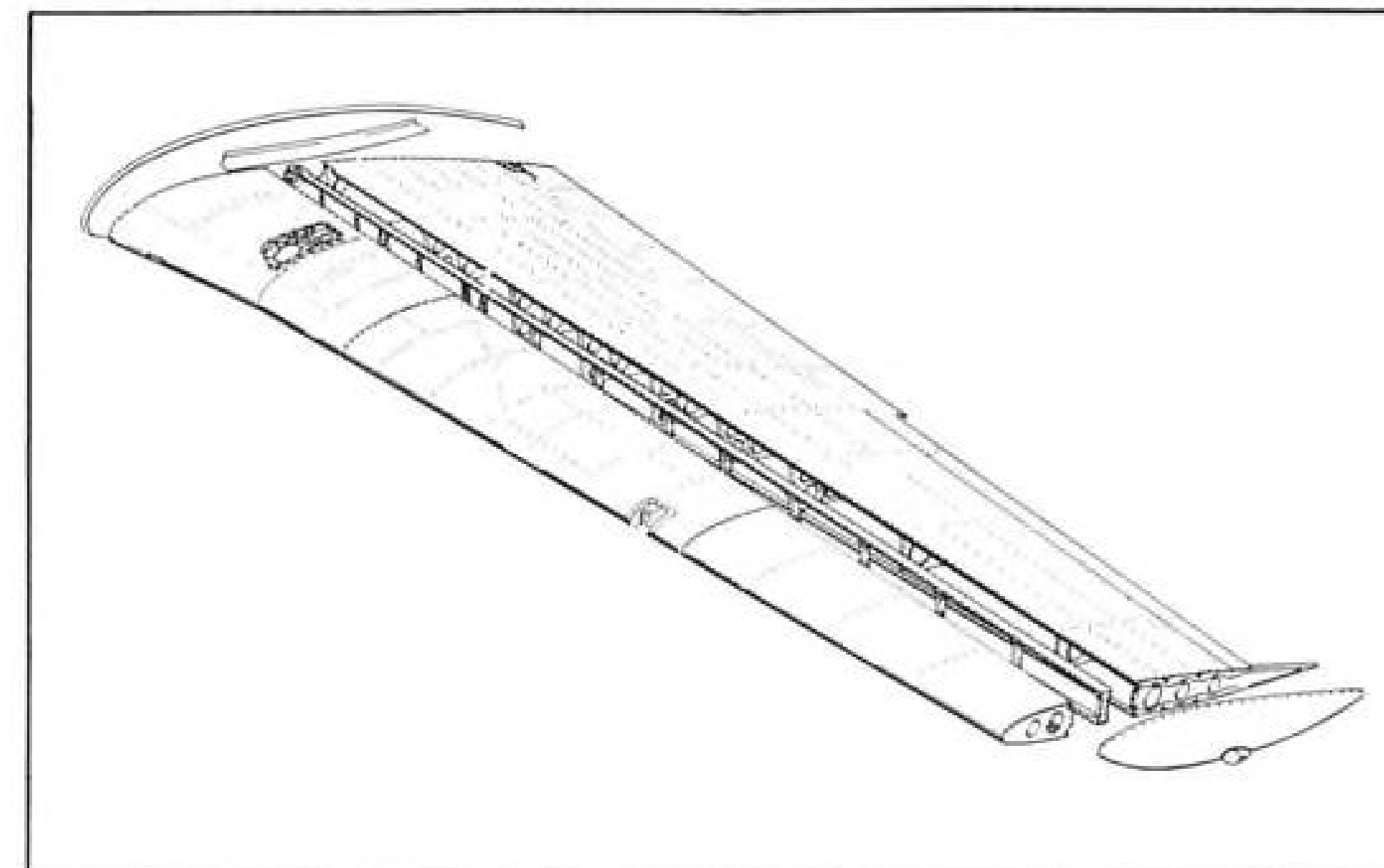
Instrument panel (except for gyro instruments) is tilted 10 deg. forward so that dials will be almost perpendicular to line of sight.

Engine controls are grouped on a lower portion of the panel, just left of center. Radio control panel is just right of center.

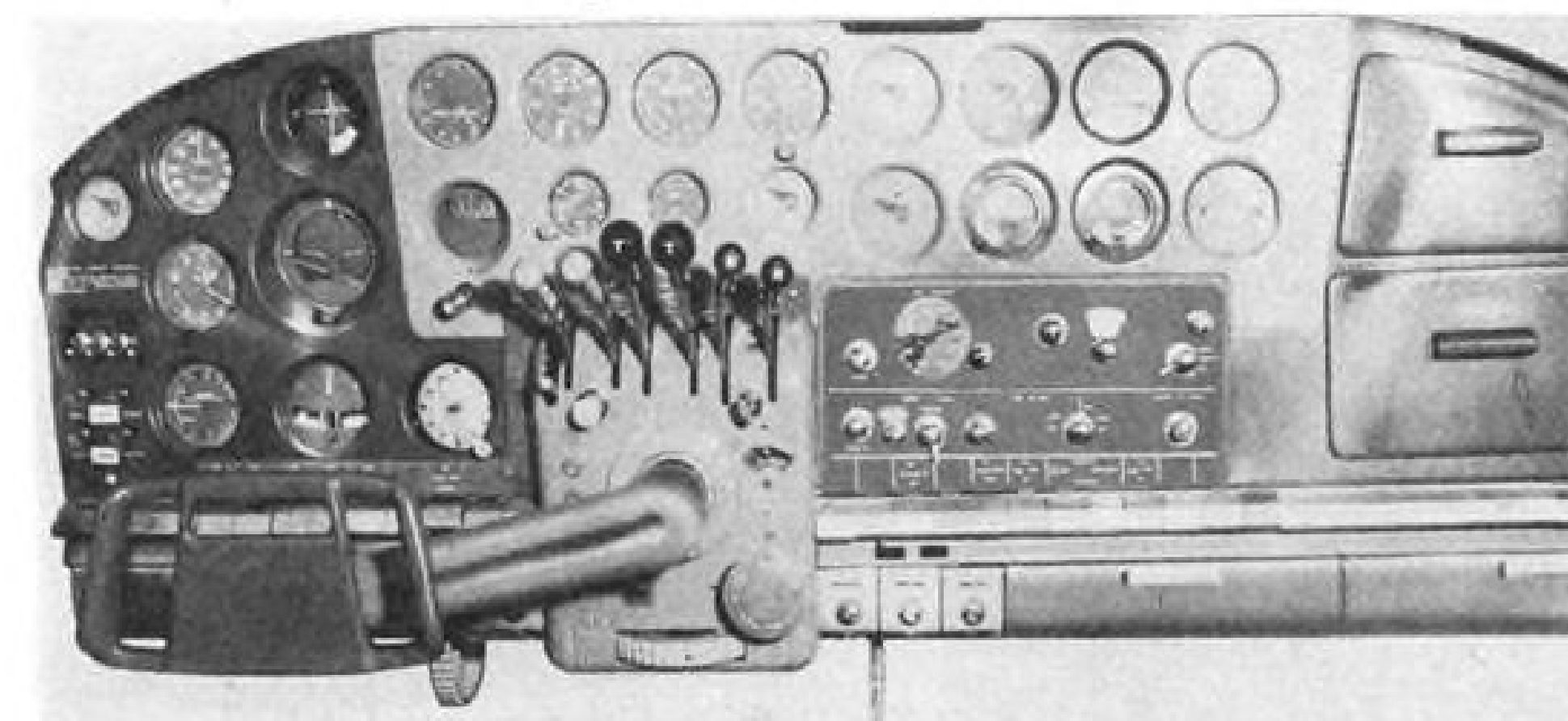
Baggage compartment aft of wing has 41 cu. ft., will hold 260 lb. and has a door about 27 in. square. Stretcher loading from ground is feasible through this rear door.

Front compartment has 21½ x 19½-in. door, has 14-cu. ft. volume, will hold 300 lb. Provision is made in the front compartment to accommodate radio equipment, with easy access through the large door.

► **Wing Features**—Piano-type hinges and stainless steel rods are used for join-



**PIANO HINGES** incorporating stainless steel rods are used to join wing leading edge, main spar and rear section to ease replacement task.



**PANEL CLOSEUP** shows grouping of engine controls and instruments. Radio is handy, and control column is of swing-over type.

ing the leading edge, main spar, and aft wing section. This simplicity should pay dividends in major-section replacement time, eliminating sheet metal work and riveting procedures.

The battery, on the wing center section, is located behind a convenient access door in the engine nacelle, just aft of the firewall.

Fuel tanks are fillable from ground through wing leading edge in the center section.

Engine cowl sections, held by four latch fasteners, can be raised to expose the entire powerplant side, allowing excellent access for maintenance without necessity for stands.

Top cowling also can be detached for engine removal.

► **Engines**—These are Avco Mfg. Corp. Lycoming-Spencer division's horizontally opposed, flat, six-cylinder, GO-435-C2 geared units.

Each develops 260 hp. for takeoff, with crankshaft speed of 3400 rpm. and 2180 rpm. on the propeller. At cruise, crankshaft rpm. is about 2600; prop rpm., 1625.

Reports are that prop noise level is sufficiently low to permit normal-tone

conversation in the cabin.

Reduction gearing, similar to that in Lycoming's geared and supercharged 400-hp. GSO-580 engine, is of the planetary type.

Six crankshaft counterweights are paired to supply balance and afford sufficient mass in a small crankshaft space. Each counterweight is a cylindrical segment supported on two rollers, with races designed to allow the weight to swing in an arc.

Crankshaft, main bearing and connecting rod journals are deep nitrided.

Powerplant accessories include Eclipse-Pioneer series E-80, type 756, model 54 starter; Eclipse-Pioneer 30v., 75 amp., 1298-1 generator; Aero Equipment Corp. A513DB vacuum pump; Thompson Products TF900-1 fuel pump; Adel electric submerged fuel booster pump; Bendix PS-5BD carburetor; Air-Maze carburetor air filter; Beechcraft stainless steel exhaust manifolds and augmentor tubes; Harrison oil cooler; Eclipse-Pioneer tachometer generator.

► **Exhaust Augmentor**—Engine exhaust stacks are grouped together to discharge into an augmentor tube, having a cross-

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## AIRCRAFT D-C ELECTRICAL SYSTEMS

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Westinghouse placed in service the first "packaged" and protected co-ordinated Electrical Power Systems for aircraft early in 1946. Its many new and convenient features have now been thoroughly service-proved in hundreds of commercial and military installations. Continuously developed improve-

ments provide the system of the future.

The D-C system diagrammed here is typical of those operating on aircraft such as the Martin 202, the Lockheed P2V, the North American AJ1, the Northrop C-125, the Aero Sud-Est SE-2010 and the Brequet 763.

J-03000

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less. The generator overhaul time can be co-ordinated with the engine overhaul time.

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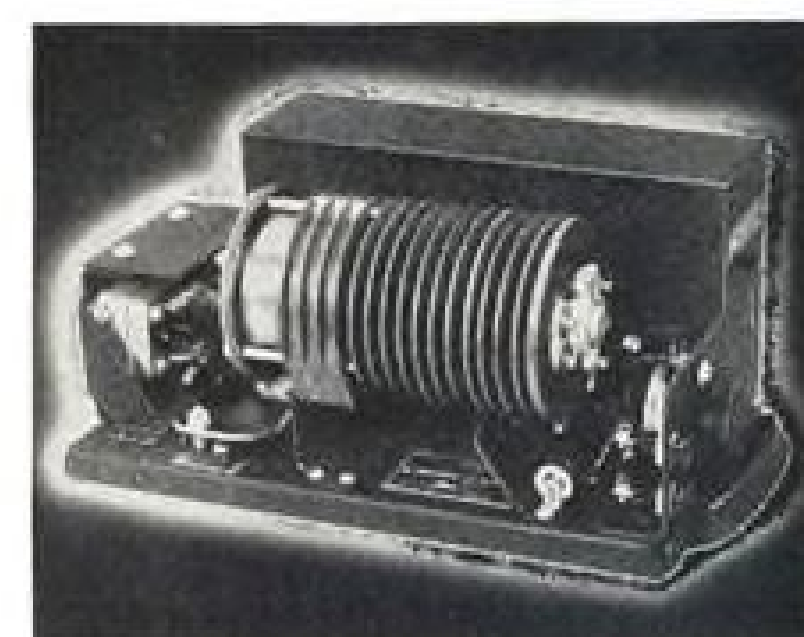
#### 4. Unit Responsibility

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OPERATORS'  
CONTROL



(C) Buttonhole Quick Disconnect Generator



(D) Centralized Plug-in  
Control Panel

### DESIGN FEATURES

1. System functions co-ordinated.
2. Accurate control selectivity eliminates hazards of over-excited generators in overvoltage and overload conditions.
3. Ground fault protection with current balance or shunts.
4. Concentrated bus.
5. Back-up bus protection.
6. Centralized control panel. Shock-mounted.
7. Arc interruption by dual contactor.
8. Electrical and manual trip-free operation.
9. Field relay automatically trips with reversed generator polarity.
10. Lightest weight for comparable performance.
11. Generator overtemperature indication. (Optional)
12. Dead bus system operation.

*For complete specification data, contact the nearest Westinghouse Sales Office.*



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## Catalog 4811...

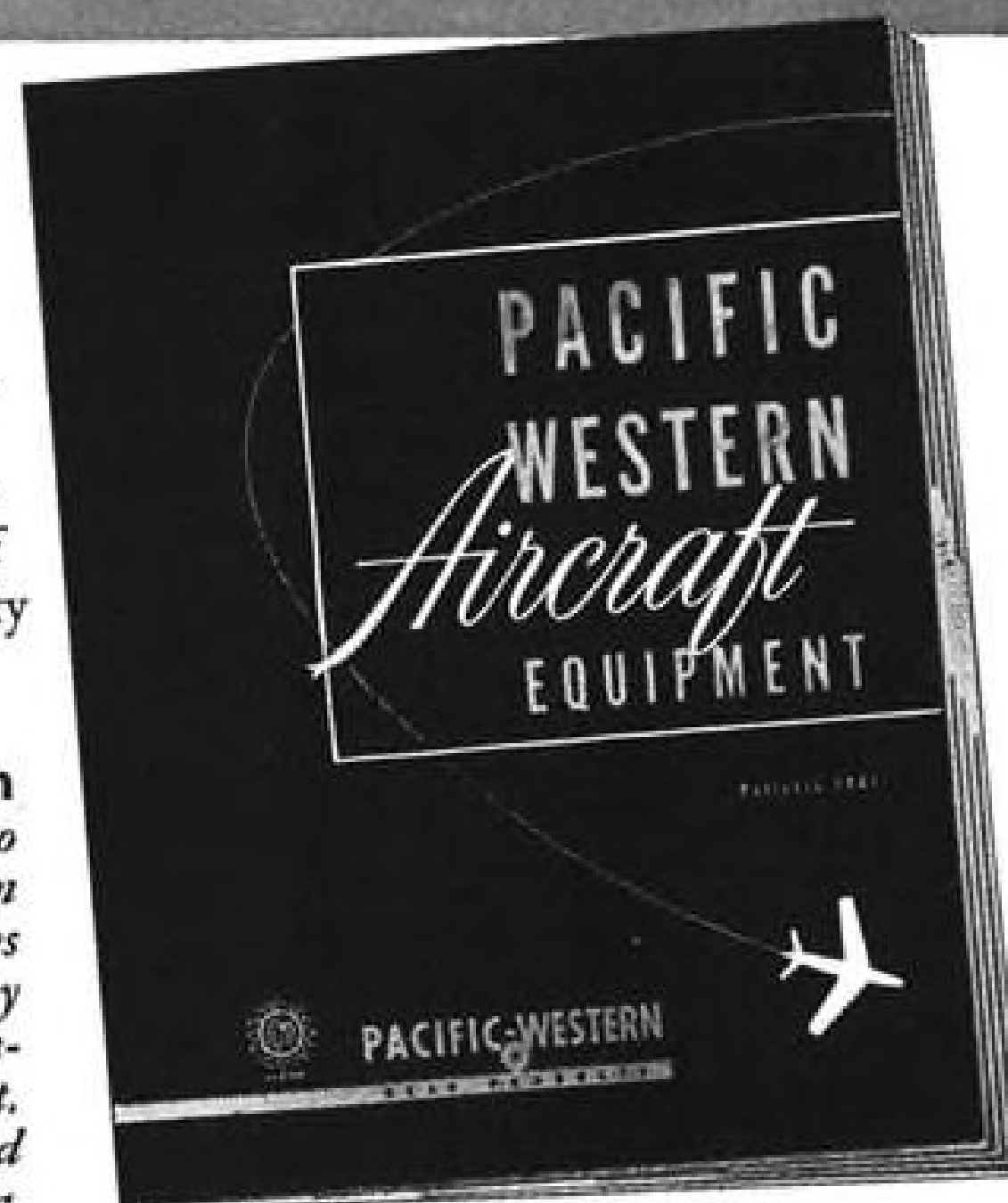
a 40-page reference catalog on aircraft actuators. It illustrates 17 typical units, including rotary, linear, and cable-drum types. Dimensions, specifications, performance curves, and applications are given for each actuator.



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NAME

TITLE

## Twin Bonanza Basic Data

### Dimensions

Span ..... 45 ft. 3 3/4 in.  
Length ..... 31 ft. 6 1/8 in.  
Height ..... 11 ft. 4 in.  
Wing area ..... 277.06 sq. ft.

### Weights

Gross ..... 5500 lb.  
Empty ..... 3750 lb.  
Useful load ..... 1750 lb.  
Wing loading at gross weight

19.87 lb./sq. ft.  
Power loading at gross weight

11.57 lb./hp.

### Performance (at Military Load, 5095 lb., 1/4 fuel)

Cruise speed at 10,000 ft.,

65% power ..... 191 mph.

Rate of climb (two engines) at

sea level ..... 1650 fpm.

Rate of climb (single engine)

at sea level:

(a) Constant speed propeller, 322 fpm.

(b) Full feathering propeller

..... 465 fpm.

Service ceiling (two engines) 20,400 ft.

Service ceiling (one engine):

(a) Constant speed propeller

..... 8100 ft.

(b) Full feathering propeller

..... 11,300 ft.

### Stalling speed:

(a) Gear and flaps extended

..... 59.2 mph.

(b) Gear and flaps retracted

..... 73.1 mph.

### Maximum range:

(a) 10,000 ft. and 65% power

(at 5500 lb. gross) ..... 935 mi.

(b) 10,000 ft. and 60% power

(at 5500 lb. gross) ..... 1005 mi.

Takeoff, over 50-ft. obstacle,

sea level, no wind ..... 1050 ft.

Landing (full flaps) over 50-ft.

obstacle, sea level, no

wind ..... 1137 ft.

### Powerplant

Engine—Lycoming GO-435-

C2 rated (sea level) at 260

hp. at 3400 rpm. for takeoff

and 240 hp. at 3000 rpm.

normal.

Propeller—Beechcraft Con-

stant Speed B 200-116.

### Fuel and Oil

Fuel, main (inboard wing

tanks) ..... 85 gal.

Fuel, auxiliary (outboard wing

tanks) ..... 50 gal.

Total ..... 135 gal.

Oil (wet sump) ..... 12 qt./engine

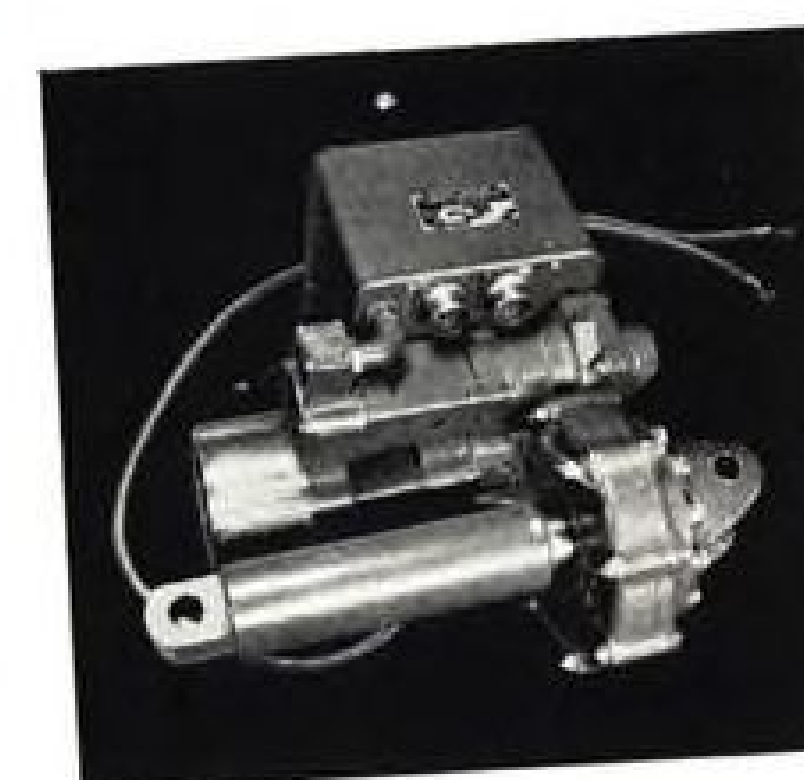
sectional area several times that of the exhaust stacks. The high-velocity discharge from the stacks sucks out the cooling air, so that continual pumping action is supplied.

There are two prime advantages to this augmentor system of engine cooling:

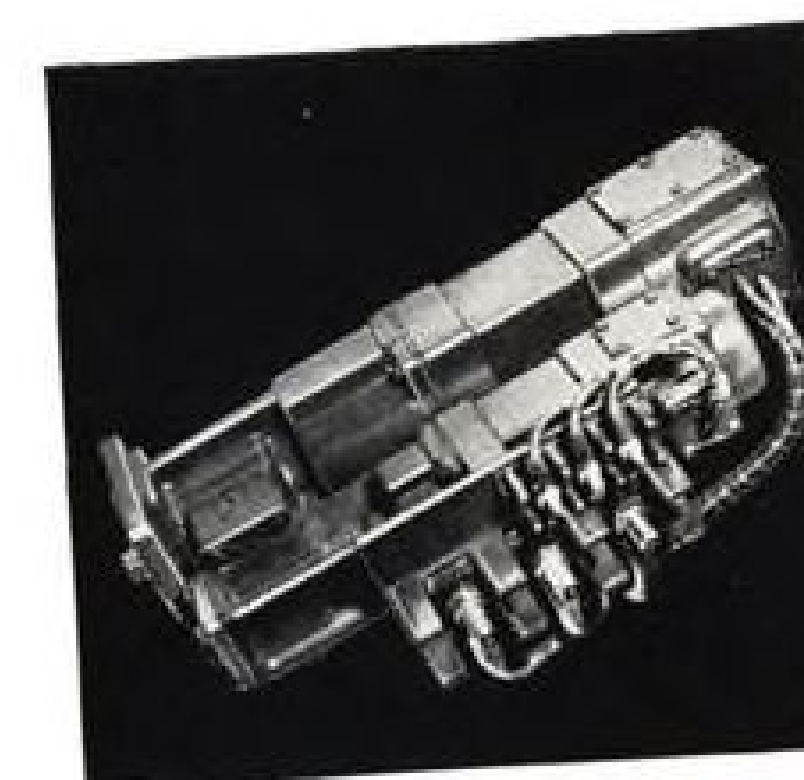
• Ample pressure drop across the powerplant (and more particularly

## EEMCO technical bulletin

**New Electric Power Units Foretell Era of Pushbutton Flight...** Faster aircraft and busier pilots are pushing automatic flight devices into the forefront. The development of versatile fool-proof power units to actuate control surfaces in conjunction with automatic pilots is a primary factor in achieving pushbutton flight. Such units are being produced by EEMCO in close cooperation with the designers and builders of tomorrow's aircraft.



**Stabilizer Actuator for Large Jet Fighters...** One such "radical" advance is the motor actuator used on a new jet fighter. This unit incorporates two motors of different size, driving into individual gear reductions to operate the screw jack. Each fulfills a particular need and is not to be considered a standby. The small motor of 1/10 h.p. output operates practically continuously under control of the automatic pilot and provides a rate of travel to jack of 6/100" per sec. The large intermittent duty 3.3 h.p. motor provides manual operation of screw jack by pilot for maneuvering and extreme situations with a rate of travel of 7/10" per sec. Normal operating load of unit 11,000 lbs....28 volt operation. Equipment includes overload and travel limit switches, radio noise filters, position indicator and non-jamming stops.



**Double Motor Power Unit for Horizontal Stabilizer...** A similarly unconventional motor arrangement operates the horizontal stabilizer actuator on a turbo-prop aircraft of recent design. A small continuous duty motor of 1/15th h.p. operating through a gear reduction is used for automatic flight and a large intermittent duty 3-1/2 h.p. with direct drive of 12,000 rpm is used for manual operation. The unique feature again is that it provides a large power source for maneuvering and a smaller unit for trimming in flight in small increments through the automatic pilot.

**EEMCO Design and Testing Service Solves Difficult Actuator and Motor Design Problems...** Tell us your requirements on current motor or actuator design problems. Include preliminary data on type of unit, specific function, special requirements, operating conditions, motor and actuator specifications and any available drawings, diagrams and tables.

SEND FOR FREE  
PERFORMANCE CHARTS  
AND DESIGN DRAWINGS...

Executives and engineering and design personnel making request on Company letterhead will be placed on mailing list for performance and design drawings of EEMCO designs for file and reference.



**ELECTRICAL  
ENGINEERING  
and MFG. Corp.**

4612 W. Jefferson Blvd., Los Angeles 16, California



## First in SAFETY

It's Sunday, June 29, 1935, at Stanley Switlik's summer place a few miles outside of Trenton. Here, today, are gathered some of the most famous people in aviation—among them, Amelia Earhart, America's great aviatrix. They are here to witness the first American demonstration of a parachute tower. The tower was designed by engineers of the Switlik Parachute Company in order to develop parachute mindedness in the public and to further safety in training.

The development was such a success that the armed forces adopted it as a fundamental part of their paratrooper training program.

It has even reached the amusement centers where parachute towers are providing an educational thrill to fast collecting crowds.

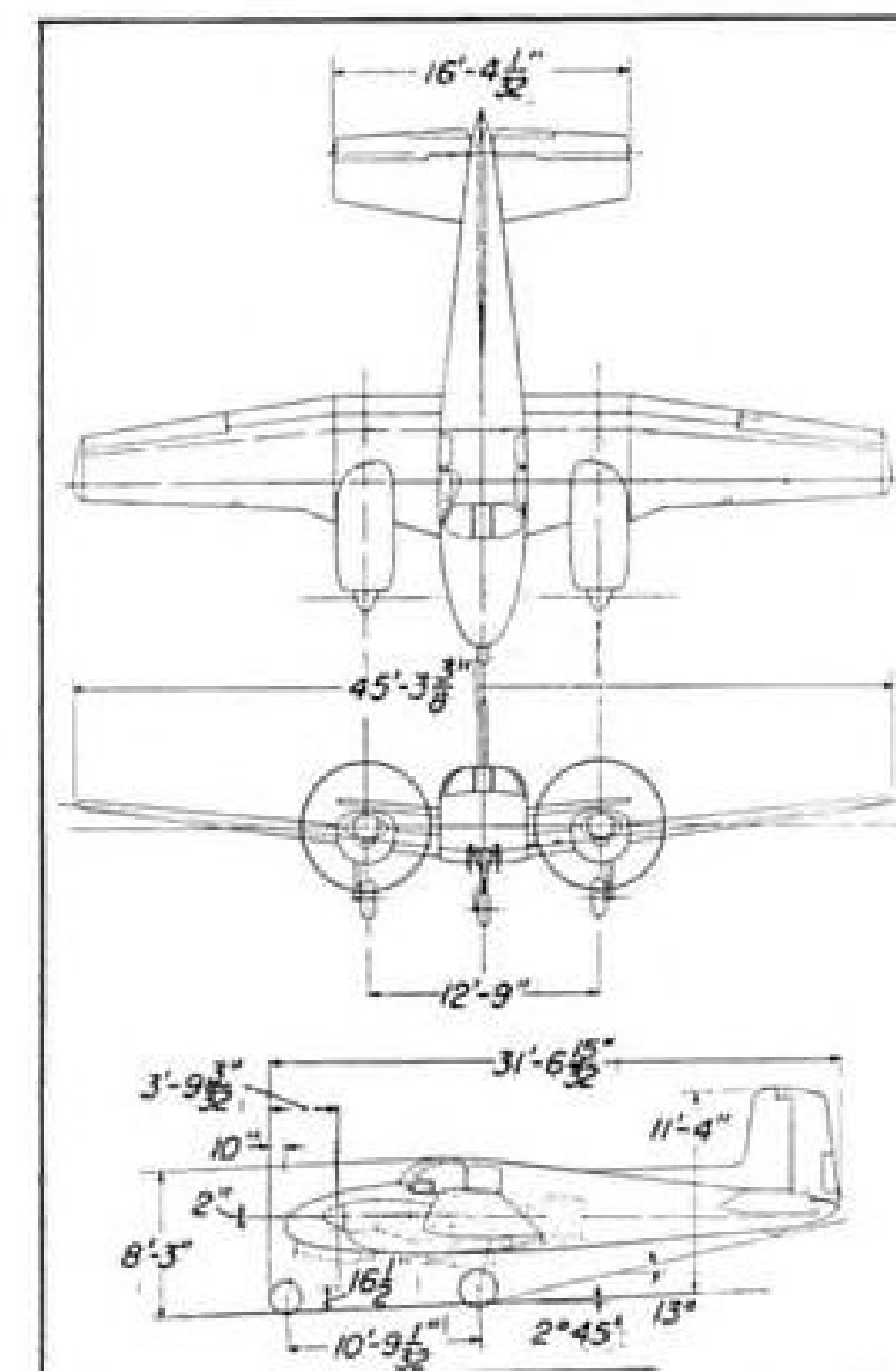
Still another first in Switlik's continuing research for greater safety.

# SWITLIK

PARACHUTE COMPANY, INC.



240 RALOR AND HANCOCK STREETS, TRENTON, NEW JERSEY, U. S. A.



Three-View of Twin Bonanza.

across the cylinder fins) to cool the engine on the ground or in a climb, without the need for cowl flaps.

• **Reduction in the drag** of the powerplant, primarily caused by the reduction in horsepower required for cooling, but also because of the cleanliness of the cowl installation.

► **Controls**—Craft has conventional three-control system.

Control column is swing-over type, with wheel adjustable in two vertical positions.

Elevator, rudder and aileron tabs are controlled by tab wheels on the instrument panel.

All movable control surfaces are magnesium, to eliminate maintenance associated with fabric-covered panels.

Nose gear is steerable and designed for loads exceeding average requirements to meet demands of pilot training.

Main gear tires are 8.50 x 10; nose wheel tire is 6.50 x 10.

Gear tread is 12½ ft.; wheelbase, about 10½ ft.

Landing gear, also flaps and the retractable cabin step, are actuated electrically.

► **Radio, Instruments**—Radio equipment includes VHF transmitter and receiver with range, broadcast, marker beacon, ADF and omni-range reception.

Engine instruments include electric tachometer, manifold pressure, suction, fuel pressure and quantity, oil temperature and pressure, and cylinder head temperature gages, voltmeter and ammeter. Flight instruments: airspeed, turn-and-bank and rate of climb indicators, sensitive altimeter, clock, compass, outside temperature gage, directional gyro, gyro horizon.



**N**ow... more than ever... let the  
Remington **Electri-conomy**  
help save typing time, increase production

In these times when increased, swift production is all-important, why not let the new Remington Electri-conomy Typewriter help you with your work. *You name it*—bulletins, reports, correspondence, statistics, records, orders, or multiple carbon copies—the Remington Electri-conomy uniformly types them all with greater speed, greater accuracy... and with amazing electric ease.

In office after office where the Electri-conomy Typewriter has been installed, the typing output has been greatly increased—10%... 20%... 30% and even higher are the percentages reported by highly satisfied users.

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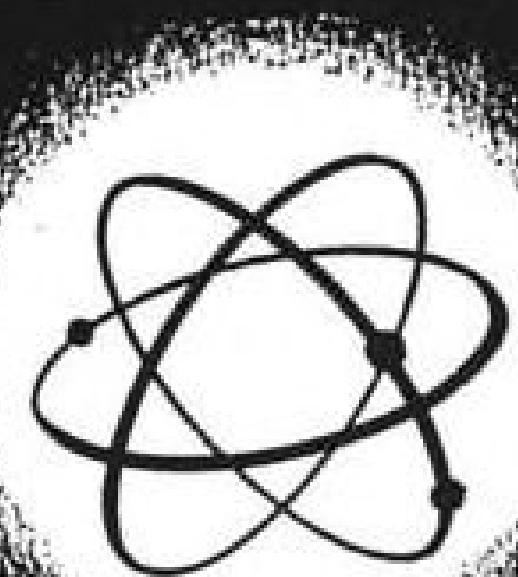
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

### FREE

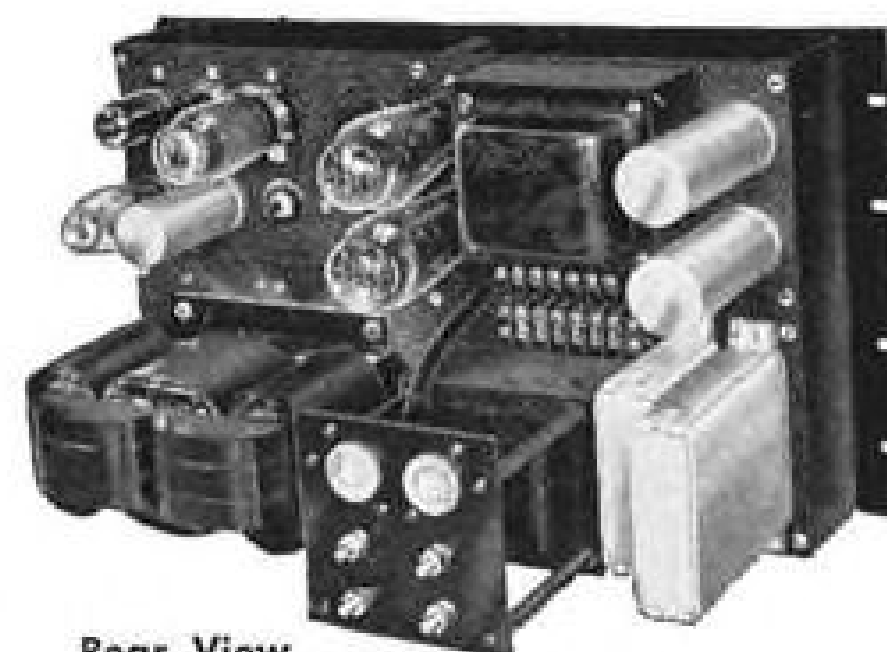
Mail the coupon for FREE color brochure which describes the Electri-conomy... tells its amazing economy story.



# QUICK AS AN ELECTRONIC WINK



That's how fast a STABILINE Automatic Voltage Regulator corrects line voltage fluctuations. Type IE (Instantaneous Electronic) has no moving parts — is completely electronic in operation. Designed to act instantaneously — with a waveform distortion not exceeding 3 percent — and to keep output voltages stable within  $\pm 0.1$  of 1 percent of the preset value, regardless of line variations. For any load current change or load power factor change from lagging .5 to leading .9, the STABILINE Type IE will hold the output to within  $\pm 0.15$  volts of nominal. Various models available in numerous ratings.



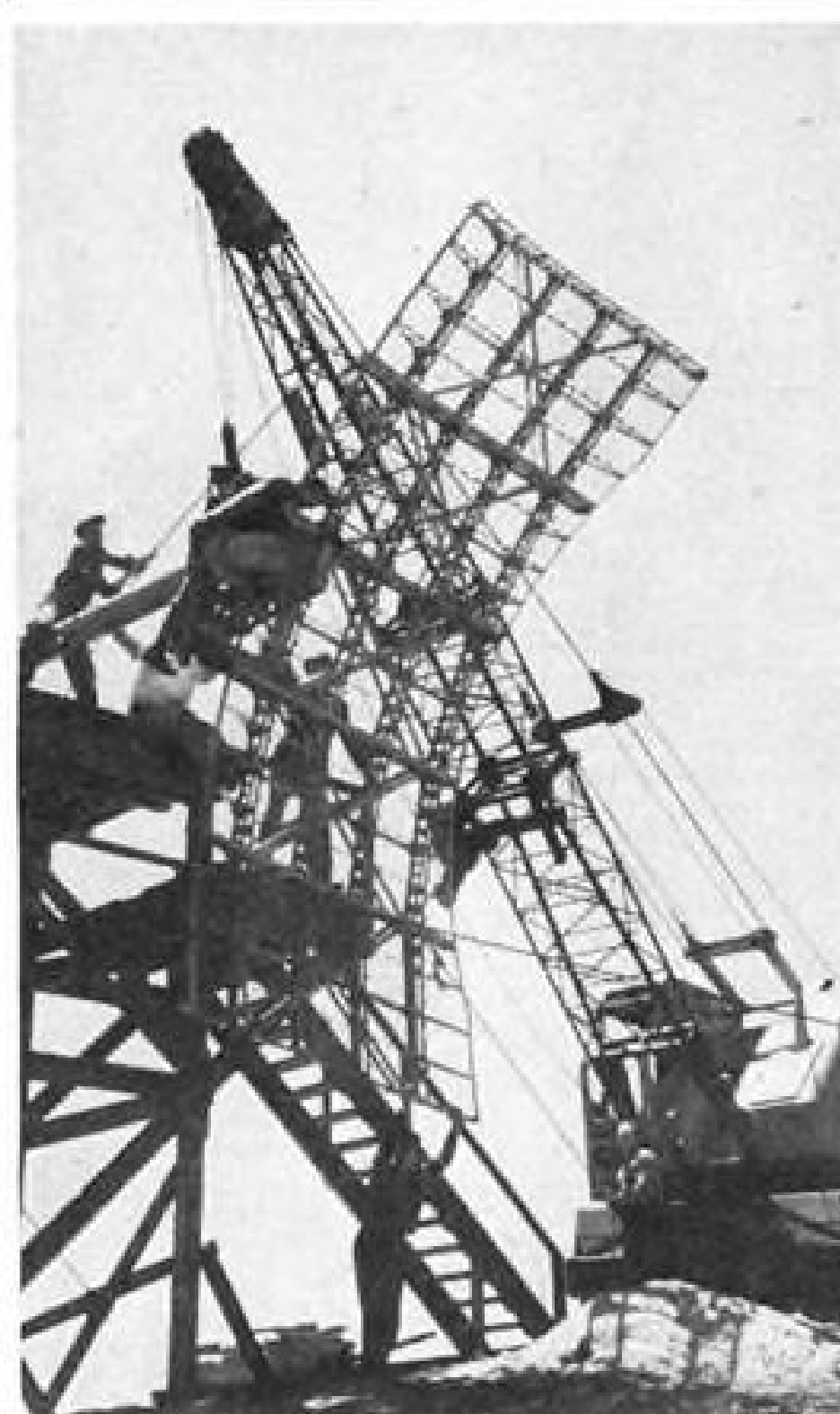
Rear View  
STABILINE Type IE

Bulletin 547 gives you information on this and other Superior Electric voltage control equipment. Write for your copy today.

THE  
**SUPERIOR ELECTRIC  
COMPANY**  
1711 MEADOW STREET  
BRISTOL, CONN.



## AVIONICS



### Surveillance Radar Gets Unique Antenna

Double curvature is the unique feature of a new airport surveillance radar antenna designed by Airborne Instruments Laboratory, Mineola, N. Y.

Reason for the added structural complication of double curvature is to get better distribution of the vertical beam radiation energy from the antenna. The beam emitted by such an antenna will more nearly approach the idealized rectangular pattern.

► **Constant-Strength Signal**—The idea behind shaping the vertical beam is to get a return signal of uniform strength from an aircraft flying at a constant altitude toward the antenna. With the present lobed shape of beams, a plane flying in toward the antenna at an altitude above the tangent to the lobe shows on the surveillance radar scope as a pip of first increasing, then decreasing, strength.

With a flat-topped beam pattern, the signal strength reproduced on the scope is unvarying with the aircraft's distance from the antenna.

And that's what this new antenna does—it emits a beam which has a flat top.

Antenna is of the half-dish type, with paraboloidal sections in a horizontal plane. In vertical planes, the sections are slightly reflexed to give a shallow S-shape.

There are some major advantages to the new design that offset its structural

complexity. These include a simpler feed system—involving only one electromagnetic horn—and a smaller size.

► **Hoisted for Tests**—The antenna shown is mounted at 90 deg. to its proper attitude. This is a test stragem only. It is much more convenient to use ground test stations for measuring beam patterns, so the vertical beam (which is the one really being worked over) is rotated into the horizontal pattern by the simple device of rotating the antenna.

Normal attitude places the right-hand side (as pictured) at the top.

Material of the antenna is mostly stainless steel, with some small use of aluminum alloy. Structural design and fabrication of the first unit was done by the ITE Circuit Breaker Co., Philadelphia, Penn.

### Low-Cost "Brain"

A new low-price electronic analogue computer offering wide utility in solving dynamic problems in aeronautical engineering research has been designed and built by Boeing Airplane Co. Estimated cost of the device, according to the company's chief engineer Lysle A. Wood is between \$4000-5000.

Patterned after a more complicated Boeing-developed computer used in its guided missile program, the new device—designated BEAC—is capable of solving lateral and longitudinal rigid body flight equations of an airplane and its control surface actuators simultaneously.

Five BEACs already are in service in Boeing's aerodynamics, structures, powerplant, mechanical equipment and acoustics-electrical departments.

The unit's time-cutting potential was demonstrated in a recent Flying Boom dynamic study in which problems were solved by one man in one week, which normally would require more than a year's time for one man with a desk calculator.

The computer requires only five basic operational components—coefficient potentiometers, integrators, limiter, two voltmeters and volt box. For its six-variable capacity, it uses 12 integrators and 24 coefficient potentiometers.

For solution of a typical problem, a set of differential equations is set up describing the dynamic system under study. The reactor units are interconnected to satisfy this same mathematical description. Since the computer is then analogous to the dynamic system, it reacts to any stimulus as would the dynamic system.



## ANOTHER GREAT AIRLINE JOINS THE DC-6 FAMILY!

**P**urchase by Pan American of a fleet of DC-6Bs again focuses world attention on this advanced Douglas air transport with its heritage of more than 13 billion passenger miles of dependable service. This brings the number of major airlines in the illustrious DC-6 family to nineteen.

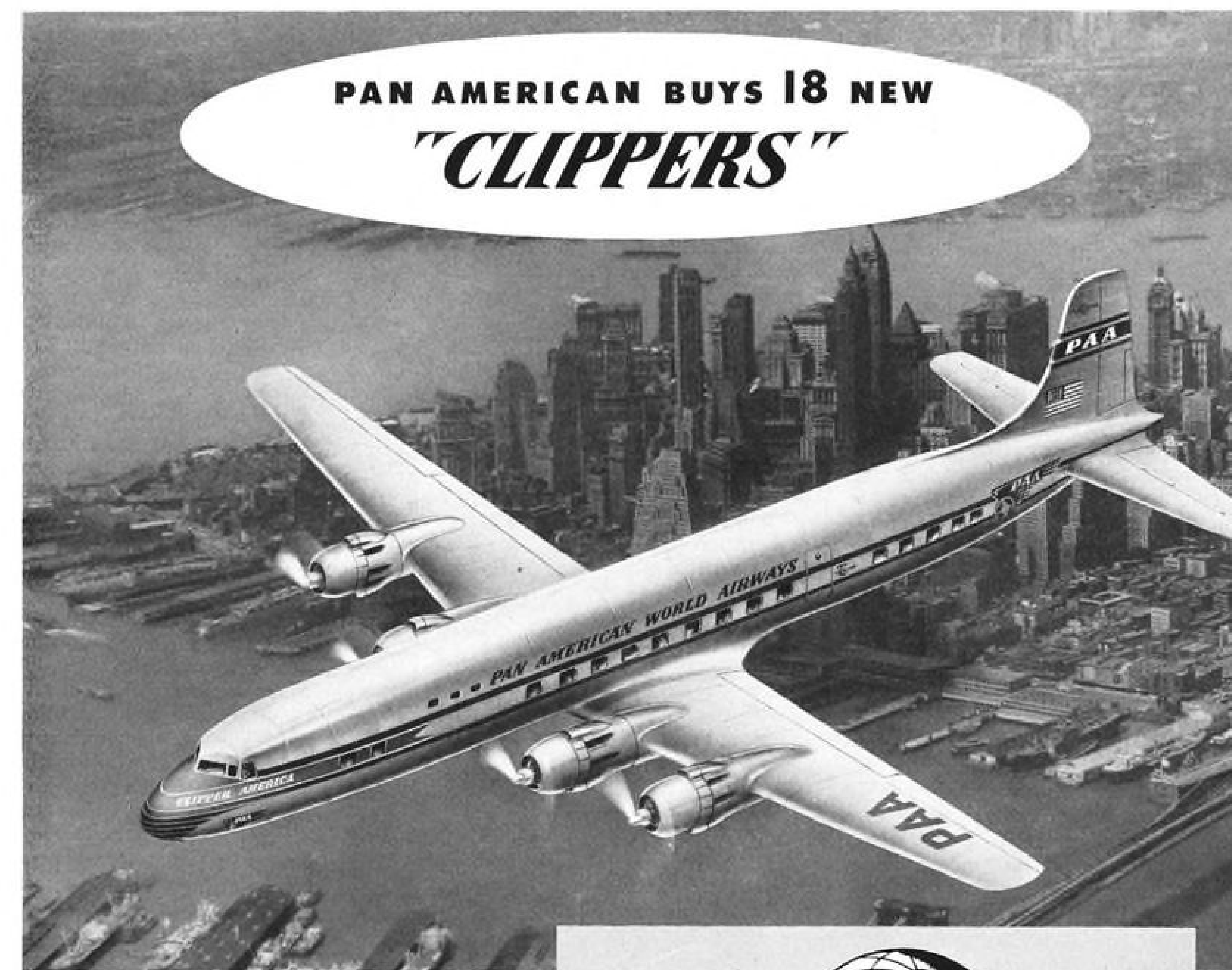
Longer, heavier, more powerful than the standard DC-6, the DC-6B was selected by Pan American because engineering and operations studies convinced them it was the finest in its class for their international requirements.

High performance with low operating costs, superior take-off and cruise performance with four Pratt & Whitney R2800-CB 17 engines, and pressurization for flight up to 25,000 feet are features of this new transport.

Cabins feature a private stateroom forward of the wing. Quick conversions can be made to a 44-passenger sleeperette, 58-passenger standard, or 84-passenger high density model.

DOUGLAS AIRCRAFT COMPANY, INC., SANTA MONICA, CALIFORNIA

## PAN AMERICAN BUYS 18 NEW "CLIPPERS"



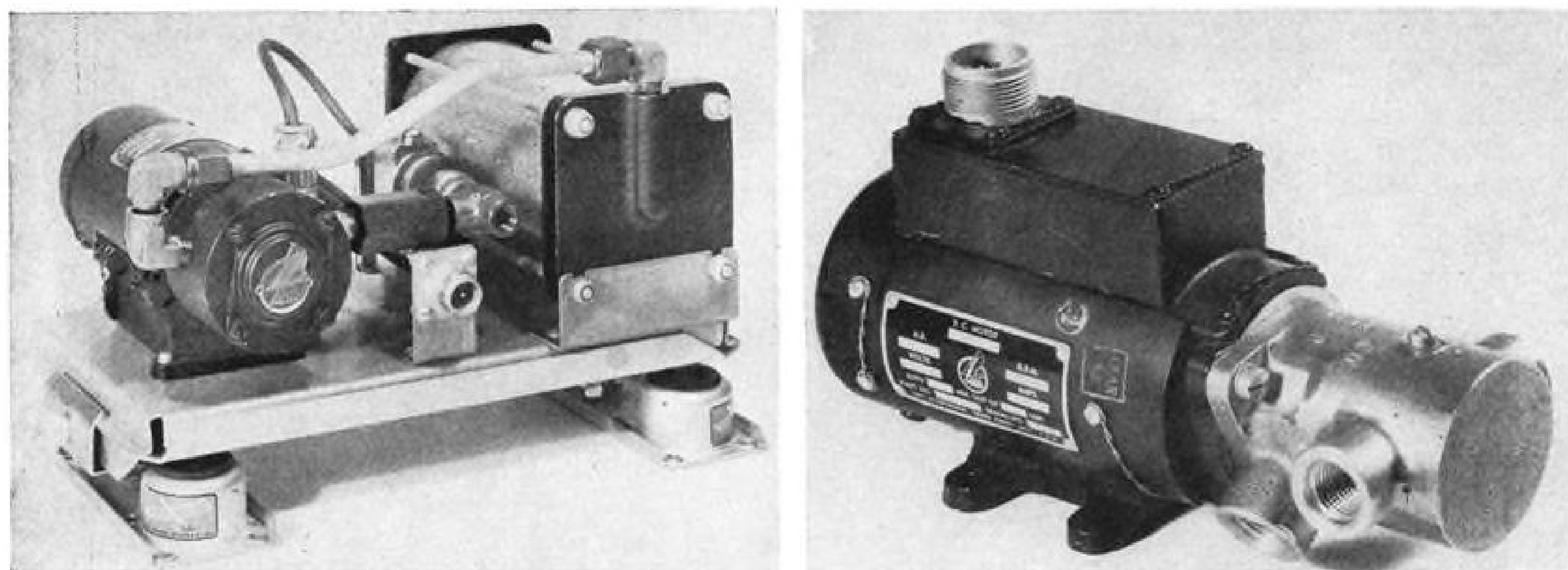
# DEPEND ON DOUGLAS

30<sup>th</sup> ANNIVERSARY YEAR





## EQUIPMENT



RADAR pressurization kit (left). Air is drawn through dessicator at the right. Airborne fuel scavange pump and motor (right).

## Romec Expanding Line of Aircraft Pumps

Elyria, Ohio, concern tooling up for production of fuel booster units; keeps an eye on future needs.

By George L. Christian

Elyria, Ohio—Romec, long known as a builder of aircraft fuel and vacuum pumps, will soon expand its line to include fuel booster pumps.

A. F. Haiduck, vice president and general manager of the firm which was acquired by Lear, Inc., two years ago, told AVIATION WEEK that engineering and design are going forward on a centrifugal, submerged type of booster pump. Capital has been approved for the purchase of necessary equipment and testing facilities and hiring requisite man power to undertake this newest endeavor. First units are expected to be ready by spring, 1951.

► **Pumps for the Future**—Also under consideration is the construction of a double-ended fuel booster pump for use in fighter aircraft. A turbine at each end of the drive motor's shaft would scoop up the fuel in the tank regardless of the ship's attitude. Romec also has ideas of how to cope with the problem of squeezing a booster pump into the skinny wings of high speed jet planes. The company is investigating the feasibility of using a thin air-driven turbine instead of a relatively long electric motor to drive the centrifugal pump.

► **Pulsationless Pump**—Principle product of the company is a dry-lubricated, vane type vacuum pump embodying these interesting features:

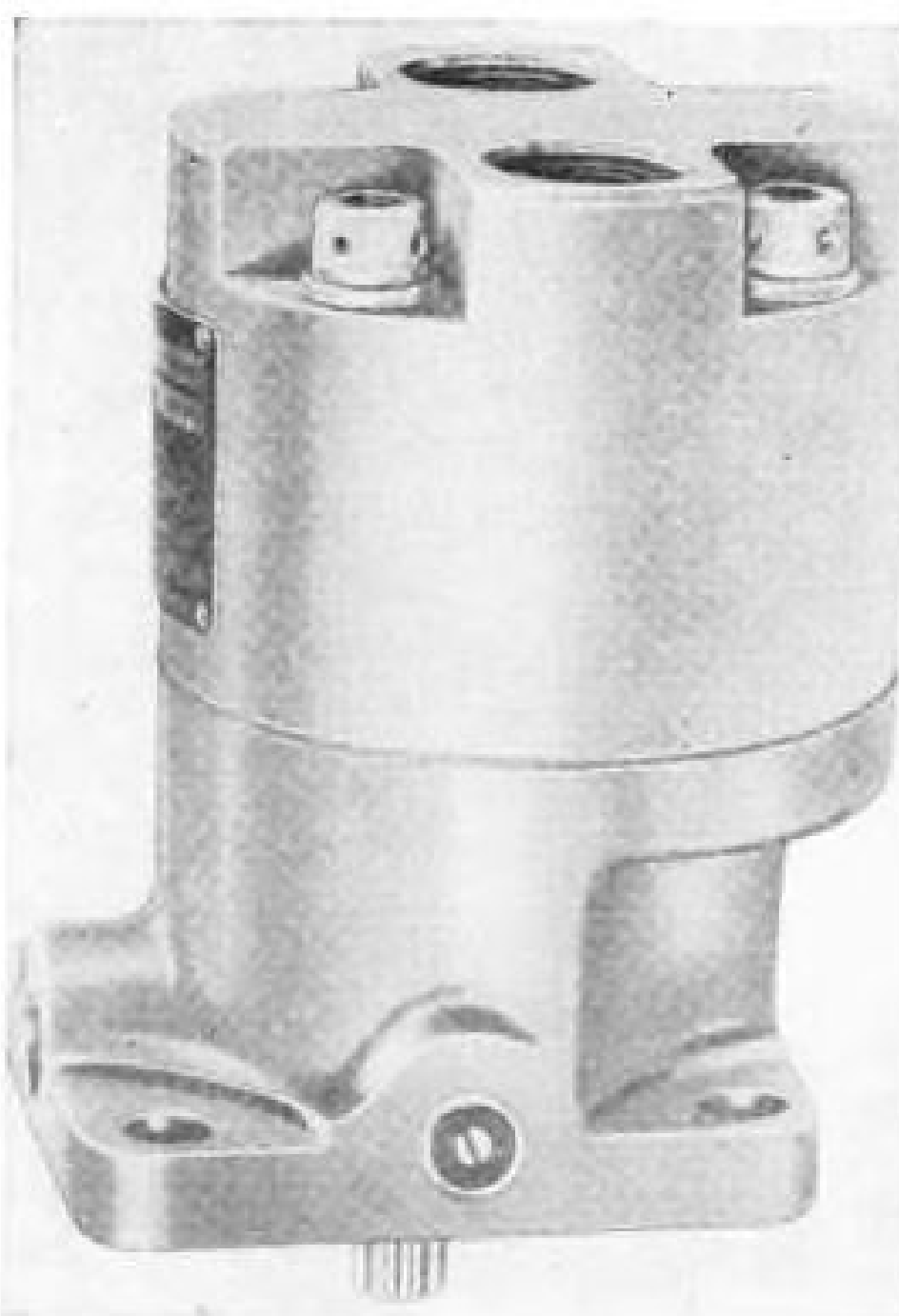
- Patented, off-set, developed bore in which the vanes are housed is responsible for the elimination of pulsation of

the pump, a highly desirable feature.

- Vanes are made of Graphitar (a compressed carbon-graphite substance), which eliminate the need of lubrication.

Other advantages attributable to the developed bore design, according to L. R. Barr, assistant chief engineer of the firm, are that a 45 deg. sealing arc is provided instead of internal seal depending on a single point of tangency; large pumping capacity for small overall size; lightness in weight.

Barr said that a big trick in the de-



EMERGENCY canopy-opening air motor

sign of this pump was taking into consideration the great expansion and contraction of the various components incurred by wide temperature variations. He added that a great asset of the pump was the ease with which it was maintained and repaired.

► **Versatile Uses**—Among its important applications, the pump can be used to:

- Pressurize radar installations on high flying aircraft. Used in Romec's newly developed RG-8990 pressurizing kit (the only one of its kind, according to Haiduck), the pump, driven by a Lear electric motor, draws air through a dessicator to assure perfect dryness, then forces it into the radar units or electronic plenum chambers. The importance of oil-free air is obvious.

The kit includes an absolute pressure switch which maintains the pressure between 28 and 32 in. hg. up to 50,000 ft. Some units include gauges to give a constant indication of pressure within the radar gear. The manufacturer claims that the lack of lubrication allows the pump to give non-sticking, positive starting operation in temperatures as low as -67 deg. F.

- Provide required vacuum for operation of camaras in high altitude reconnaissance planes. The largest vane type pump built by Romec is harnessed to this type of job in the RB-36D.

- Pressurize hydraulic tanks. In some installations, radar pressurization pumps are also used to supply pressure to hydraulic tanks to reduce the possibility of hydraulic pump cavitation.

► **Packing to Pumps**—The company was born in Elyria with the name "The Metallic Packing and Manufacturing Co.," a title changed in 1931 to "Romec

Pump Co.," short for "Rotary Mechanical Engineering Corp."

An historical outline of the firm's activities asserts that Romec was the "oldest company to furnish vacuum pumps to the aviation industry" and built "the first (aviation) fuel pump to travel around the world."

Since coming under Lear's management, the firm has been revitalized and is producing an ever-expanding variety of pump types for both military and civilian use.

Romec says, for example, that its engine-driven fuel pump, type G-18,

100 gph unit has been adopted as standard equipment for Army "puddle-jumper" liaison planes. The pump is designed for fuel systems in the 2½ - 20 psi range and weighs 1.94 lb.

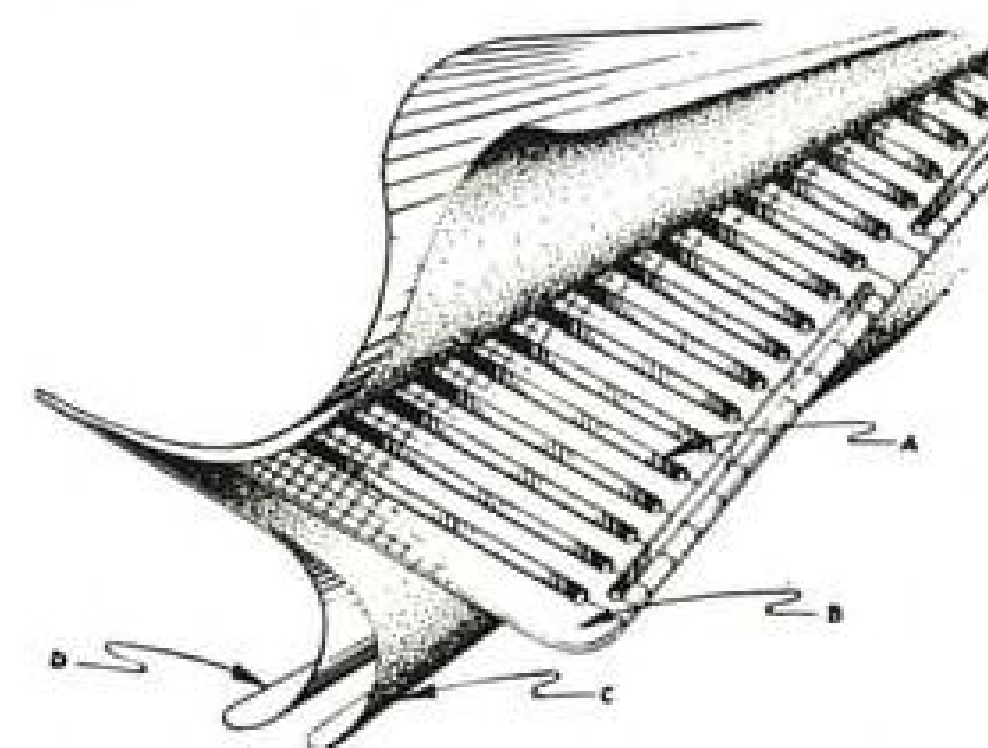
► **New Designs**—Among its newest products, Romec points to:

- **Pneumatic motors.** Of the rotary gear type, these motors are used to provide positive opening of pilots' canopies in case of emergency. Operation is from a 1500 psi. air bottle. Features are high starting torque which is practically proportional to input pressure, and escape plugs for venting air leakage away from

drive shaft, thus obviating need for shaft seals.

- **Fuel scavange pumps.** A quantity order has gone to Romec for these units, the manufacturer states. Units are used to pump away fuel left in the intake manifold of bomber aircraft after mid-air refueling.

Haiduck averred that it was his company's willingness to custom-design pumps for a particular application, plus its successful development of the dry-lubricated pumps were responsible for boosting the company's sales to \$1,500,000 last year.



## Heating Pad De-ices Flaps on B-36 Jets

That extra burst of speed provided the B-36Ds by their pod-mounted jet engines is insured in part by a new type of electric heating pad, recently developed by the Connecticut Hard Rubber Co., New Haven, Conn.

This rugged heater combats the high altitude cold and ice, warming the frostbitten noses of the jets so the pilot can retract the intake flaps and start the engines. Without its ice-removing powers, exposed flaps might stick in the extended position—preventing operation of the jets, since air would be blocked from the intake ducts. Flaps close off ducts to cut drag when the engines aren't being used (AVIATION WEEK July 24).

► **It's Cold Outside**—The heater is designed to de-ice the shut-off flaps at temperatures down to a frigid -100 F. Now that it has performed satisfactorily in actual service for several months, military aircraft manufacturers are showing interest in using it for other purposes. For example, it might be employed to thaw out openings through which flight refueling gear is extended.

The unit is a standout not only in its ability to deliver heat, but in its resistance to an extremely wide range of temperatures—for this kind of equipment—running through a spread of 600 F., say engineers who developed it. They give a respectful nod to the stiff requirements they had to meet in the specifications drawn up by Consolidated

Vultee Aircraft Corp. The heater not only has to resist temperature peaks as high as 500 F., but must remain flexible at -100 F. so that it won't crack if the doors bend.

The firm says ruggedness of the heating pads can be credited to the use of specially developed silicone rubber-coated Fiberglas materials. This also accounts for lightweight and thinness of the units—only 0.050 in. thick.

The heating pads are cut to the shape of the individual flaps and are fitted to the inner surfaces, providing enough heat to penetrate through the metal and melt ice on the outside.

Installed in the B-36, the heater can operate steadily at 300 F. with a heat output of 3 watts/sq. in. Engineers estimate this could be raised to a maximum of 15-18 watts/sq. in. with a maximum element temperature of 400 F.—limitation of the wattage rating being determined largely by how fast heat can be transferred from the element.

The sketch above (lower right) shows how the heater is assembled. Resistance wires (a) are wound around a dielectric form (b). This relatively rigid form is made of a silicone-resin-Fiberglas laminate. It is covered by a rubber-coated Fiberglas insulating cover (c), which in turn is enclosed in an outer material (d) of the same type.

## Pan Am's New Life Vest

A new life jacket, selected after careful study of past operational experiences and extensive tests in competition with other types in Florida waters, has been ordered in quantity by Pan American World Airways.

Called the MV-104 "Strato-Vst," the life preserver is an inflatable, open-front, vest-type jacket made by McLean Mfg. Co., Sussex, N. J. It carries special features added by the firm in collaboration with PanAm's engineers, and will be standard equipment on the airline's Atlantic, Latin-American and Pacific-Alaska divisions.

Major advantages of this jacket over older life vests used by the carrier are

that it is less apt to be put on wrong by passengers and can be tied more securely in front. Here are some of the reasons PanAm gives for switching to the new jacket:

- **It is reversible** so that passengers can put it on either way and get correct support in the water. Non-reversible vests formerly used floated the body improperly and were hard to tie in front when mistakenly worn inside out.

- **It will carry an adult and infant**—open front vest can be wrapped around baby, placed high on adult's chest, and secured to desired tightness by tie-strings.

- **It is simple**, and with armholes like those in man's vest, and should stay on the passenger even if he jumps in the water with front strings untied.

- **There are no straps that go between the legs** as in Air Force jackets once used by the airline.

- **It can be loosened** in front if uncomfortably tight around the neck.

- **It is priced lower** than any other jacket which might have fitted PanAm's requirements.

► **Fits Best**—PanAm engineers emphasized to AVIATION WEEK that many of the other jackets tested at Miami performed very well. The Strato-Vst was chosen because it best fitted the airline's particular needs.

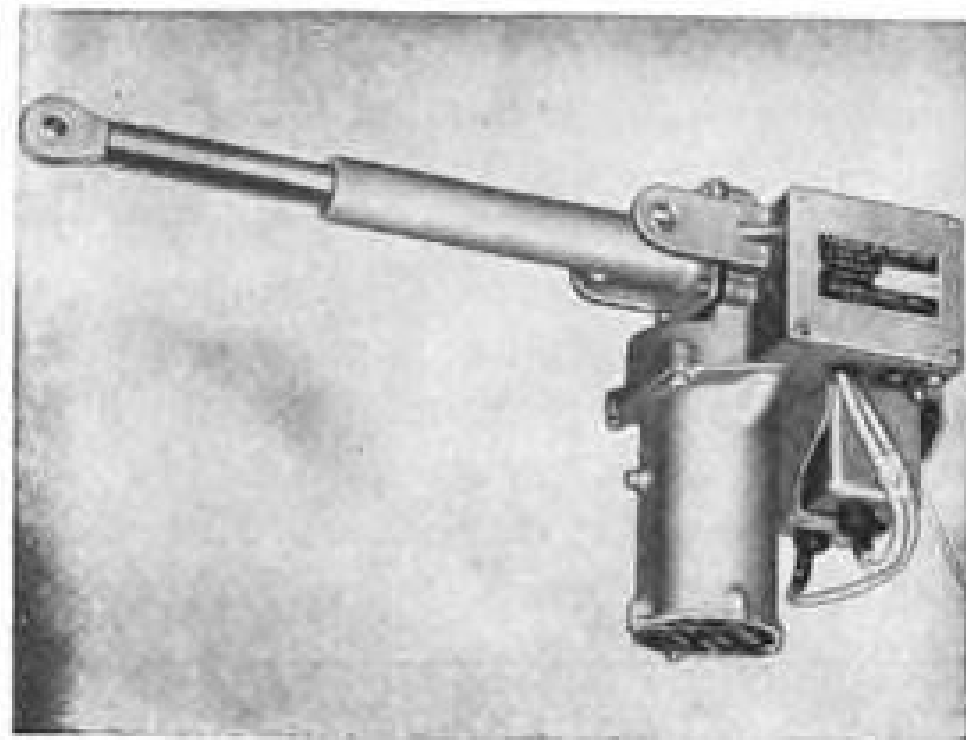
Several changes were made in the original vest as a result of the Miami tests and discussions between PAA engineers and the designer, Ernest Guizzetti, vice-president and engineer of McLean Mfg. Co. An upper tie-string now gives more positive support of the head out of water and better secures an infant to an adult.

Another complaint with old vests was that the oral inflation tubes, which pointed inward, often gave the passenger's neck a nasty surprised dig when he yanked the CO<sub>2</sub> inflation cord. Now, oral inflation tubes normally remain outside of the chambers and cause no discomfort.

The jacket weighs 19 oz., takes up 1/10 cu. ft. of stowage space and costs \$13.75 or less, depending on number ordered.



## NEW AVIATION PRODUCTS



### Valve Minus Chatter

Smooth operation with "complete elimination of chatter" is promised in a new balanced outlet relief valve designed for use in aircraft hydraulic systems operating at pressures up to 3000 psi.

The valve has been built so that the crack to full flow relationship is very narrow, the maker says. For example, in a valve of  $\frac{1}{2}$ -in. tube size, there is only a 4.5 psi. pressure drop at a flow of 8 gpm. when the unit opens. If set to crack at 1500 psi., the device will fully open at 1504.5 psi. It is made by Vinson Mfg. Co., 8044 Woodley Ave., Van Nuys, Calif.

### Unit Runs at -105F.

Hydro-Aire, Inc., has announced development of an electro-mechanical, linear actuator capable of operating at temperatures below -100 F.

The unit, one of a series being developed by the firm for various low-temperature uses in aircraft, already has found a place in the B-36 and B-47 and other craft, according to the company. Final qualification tests for Air Force and Navy approval now are being completed, it says.

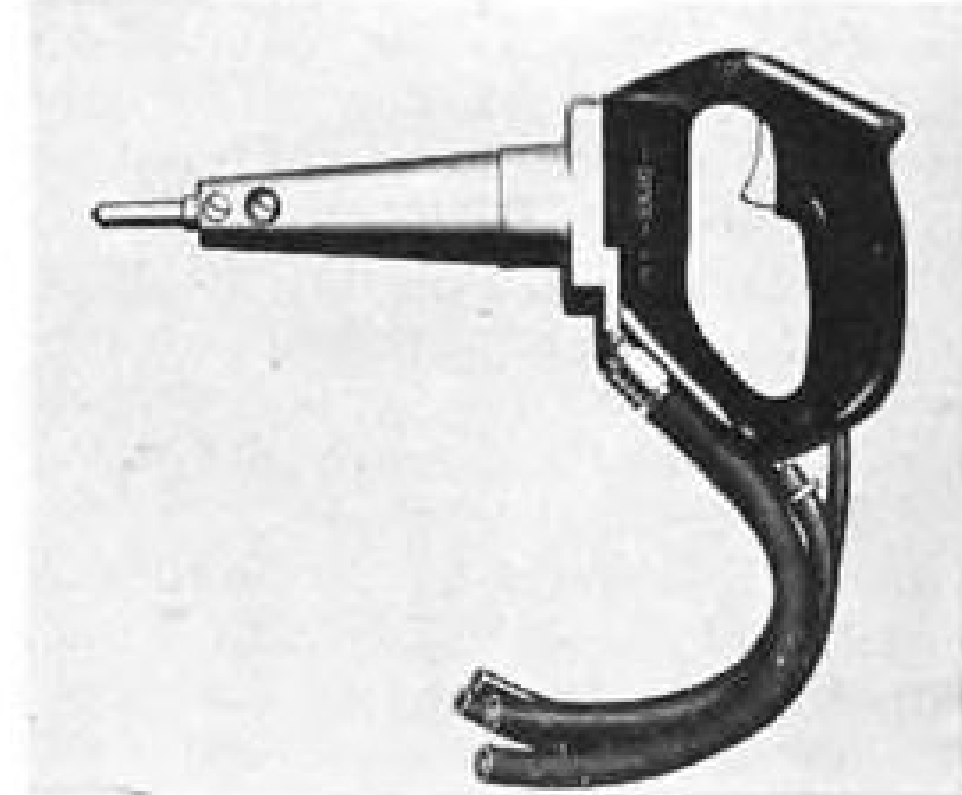
The device is designed for operation of carburetor pre-heat valves, trim tabs, air duct doors, anti-icing controls, inter-cooler air shutters and similar applications. It can handle a 200-lb. axial compression load and a tension load of 100-lb. The actuator has a squirrel-cage, induction motor, running on 115v. a.c., 400c., single-phase current.

Here, according to Hydro-Aire, are some of the design factors permitting operation of the unit at temperatures as low as -105 F and as high as 165 F.:

- Use of a plating and friction reducing process developed by the firm.
- Careful selection of materials which can be subjected to extreme ranges of temperature without creating thermal expansion problems.
- Maintenance of very rigid tolerances for all moving parts.

The actuator is equipped with positive, non-jamming stops and adjustable load limit switches. Stroke is 2.31 in., but with a new adjusting device, it can be reduced to  $\frac{1}{2}$  in. An integral brake stops overtravel under full load within 0.02 in. after power has been shut off. The unit has a duty cycle of one minute on, 15 minutes off; a maximum current drain of 15 amps.

Present users of the equipment, according to Hydro-Aire, are Consolidated Vultee Aircraft Corp., McDonnell Aircraft Corp., and Boeing Airplane Co. Price of this actuator, designated No. 9507, is about \$130, depending on amount ordered. Address: 3000 Winona Ave., Burbank, Calif.



### Explosive Rivet Gun

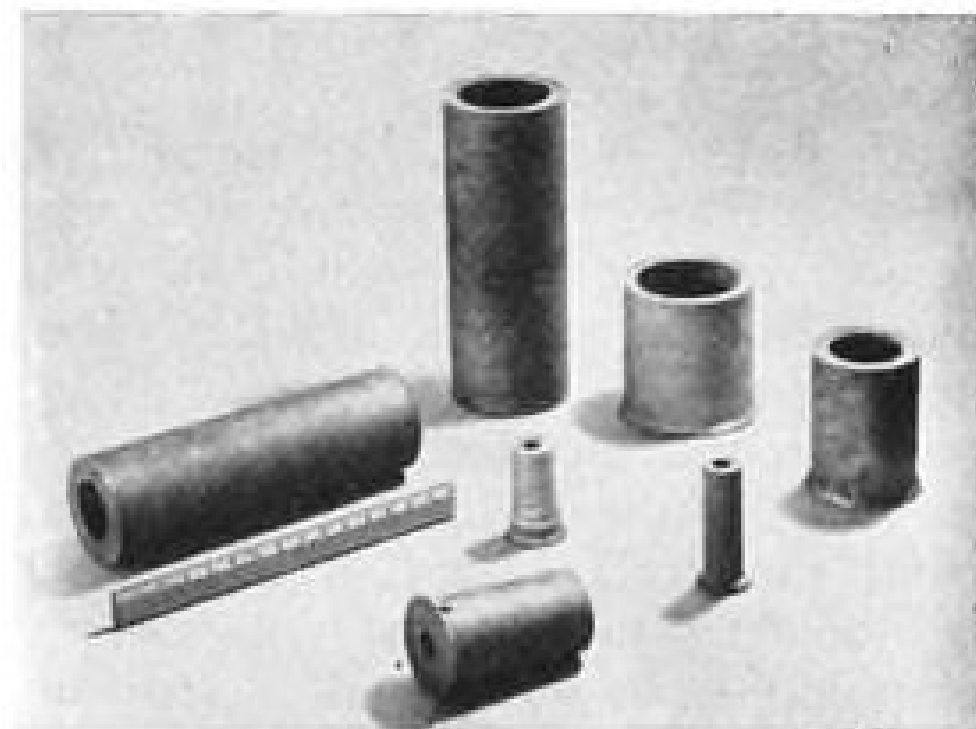
A lightweight gun for setting du Pont explosive rivets, designed, among other things, for easy handling by women workers in aircraft and equipment plants, is being produced by the Ripley Co., Inc., Middletown, Conn.

With this unit, a single touch of the switch, conveniently mounted on the two-piece, phenolic handle, will set a rivet in less than two seconds, says the maker. The tips are made of Nichrome steel welded to a bronze base. The unit has been built for easy manipulation on heavy production work.

### Non-Metal Stampings

A wide variety of stampings, made of phenolic resins, vulcanized fibers, plastics insulation paper and other non-metal materials, now is available in short-run orders from Federal Tool and Mfg. Co.

The firm will supply parts made of these materials in any quantity from only three pieces up to 2000. Stampings for radio or electronic unit frames, insulators, spacers, panels, gaskets, cams and other parts are available in sizes up to 9 x 12 x  $\frac{1}{2}$  in. Address: 3600 Alabama Ave., St. Louis Park, Minneapolis, Minn.



### Larger Castings

American Non-Gran Bronze Co. has extended its production facilities, enabling it to turn out larger centrifugally-cast parts. It will produce bronze-alloy parts up to a maximum outer diameter of 12 in. and length of 13 in.

Aircraft and equipment manufacturers and engine firms now can get centrifugally cast liners, sleeves, rolls, rings, bushings and other parts in the new sizes either rough or machined. Address: Berwyn, Pa.

### ALSO ON THE MARKET

Pilot's sun glasses are designed to give better protection to eyes with impact-resistant, heat-treated lenses. Available with either green lenses for clear days or yellow ones for foggy days. Made by: Willson Products, Inc., Reading, Pa.

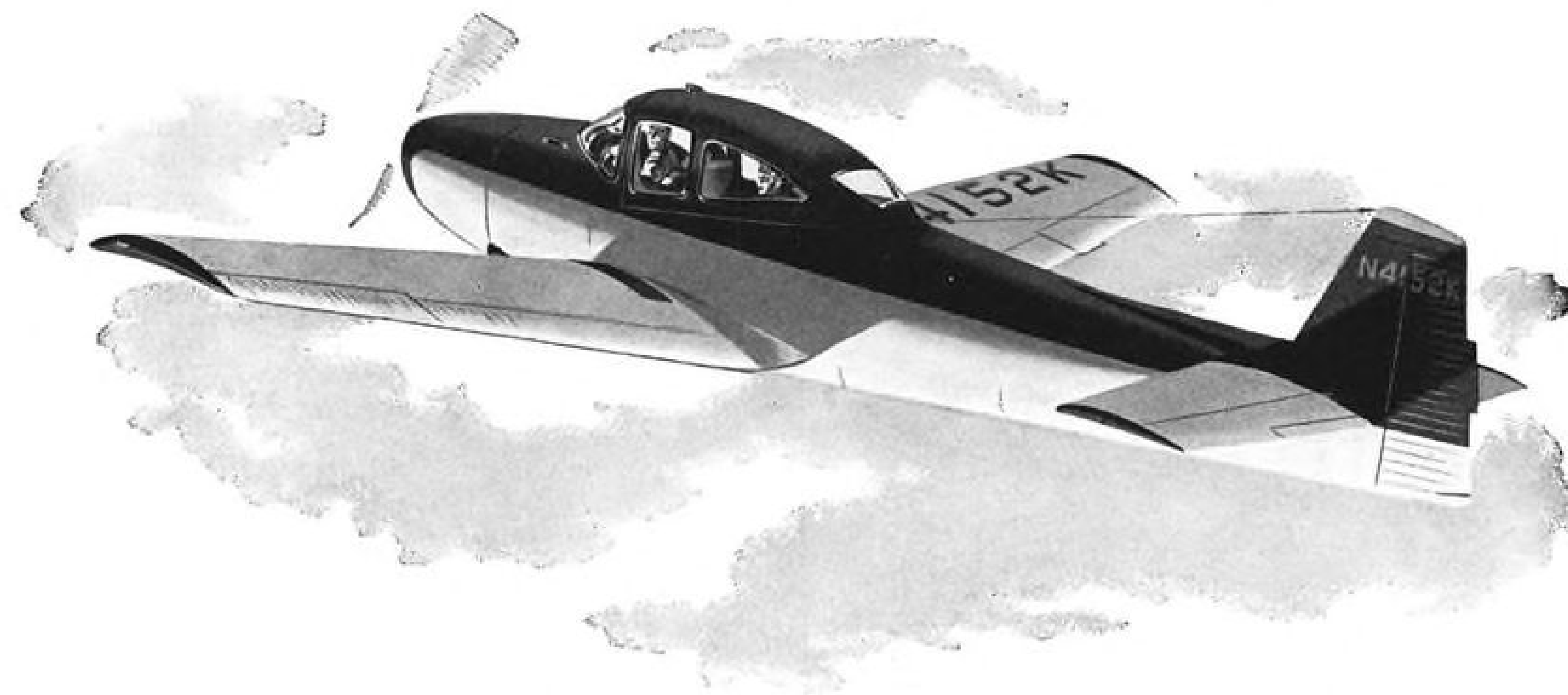
Combustible gas indicator for determining gas-free condition of tanks "cannot be poisoned by tetra ethyl lead," says maker. The instrument, Vapotester Model M-1, Type L, is described by the firm as the only indicator approved so far for use on "leaded stock" by Underwriters and Factory Laboratories. Made by: Davis Emergency Equipment Co., Inc., 45 Halleck St., Newark, N. J.

Electrical outlet box is portable unit with eight receptacles for connection of standard Edison line cord plugs. An answer to makeshift outlets, it has a switch to turn off both legs of all receptacles and a light to indicate power flowing through switch. Also included are two fuses with fuse extractors. Made by: Sun Radio & Electronics Co., 122-124 Duane St., New York, N. Y.

Rubber housings secure microphones to all types of masks. Housing is buttoned to opening in mask and cemented in place. Made by: Scott Aviation Corp., Lancaster, New York.

"Impakdriver" is hand tool which translates impact from hammer blow into torque to turn screws, bolts or nuts. Device is available with steel bits and sockets in different combinations. Made by: H. K. Porter, Inc., Somerville, Mass.

## NOW...The Better-than-Ever SUPER 260 NAVION for '51

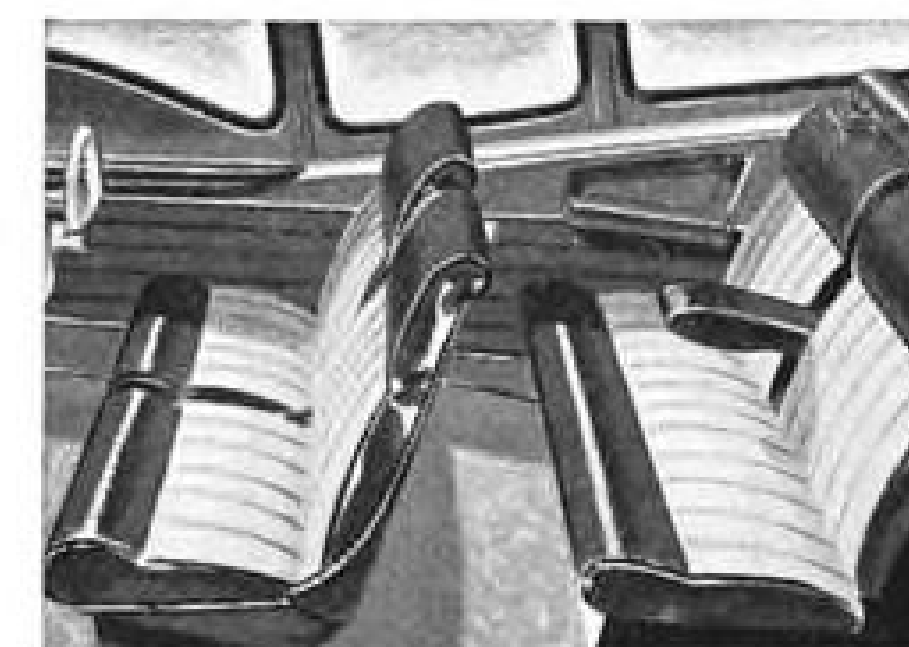


Want the performance thrill of your life? Fly the new, better-than-ever Super 260 Navion for 1951! Feel the surging power of the 260-hp Lycoming engine... relax while the *exclusive* inter-connected control system practically flies

the 170-mph Navion for you. Yes, flying's more fun in the new Super 260 Navion. It outcruises, outclimbs, yet lands shorter than other planes in its class. And, for '51—look at these brand new features:

### • NEW...More Beautiful Interior Styling

Luxurious interiors styled by Charles of California. Beautiful, harmonious colors and fabrics with generous leather trim. Upholstery is extra-thick foam rubber. And the new "reverse flow" ventilating system brings plenty of bracing fresh air into the comfortable, roomy cabin.



### • NEW...Exterior Baggage Door

The new Navion Luggage Master makes baggage a cinch to load and unload. No need to climb in and out of plane while loading... do it all from the outside. Luggage Master is equipped with a sturdy lock for complete protection. Folding rear seat affords easy access to baggage in flight.



### • NEW...All metal selective pitch Hartzell propeller... push-button starter on the dash board... beautiful, new two-tone exterior enamel finishes... sun-visors and curtains for pilot and passengers.

*Ryan Navion*

NO OTHER PLANE COMBINES SO MANY FEATURES SO WELL

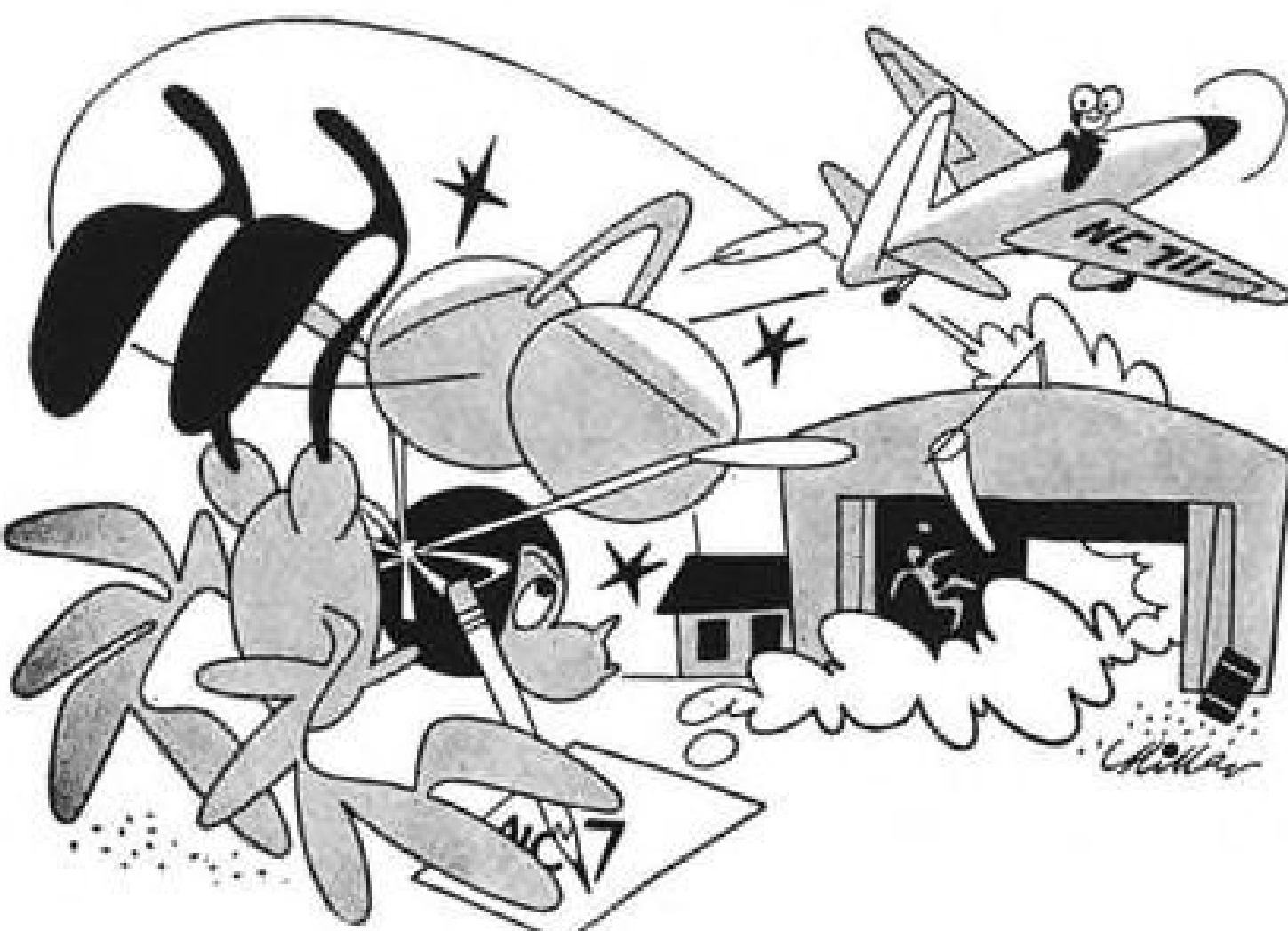
*Rely on Ryan* RYAN AERONAUTICAL COMPANY, 411 LINDBERGH FIELD, SAN DIEGO, CALIFORNIA



# The Birdmen's Perch

OKAY—so we're boilin' mad!

Just read some CAB figures on "buzzing" accidents and they're just too sickening to repeat. All of which makes us



wonder why that super-idiotic category known as "buzz-boys" don't become *Kamikaze* pilots. They'd stand a better chance.

"Buzzing," taking chances at low altitudes, is by all odds the stupidest, most dangerous thing a pilot can do. You not only risk your own life, but the lives of others, your plane, and damage to other property!

In short, the so-called "buzz-boy" is a menace—arch enemy No. 1—to the perpetuation and advancement of aviation and all that it stands for.

As a flyer or aviation enthusiast, you've

got a duty to perform. Report "buzzing" airplanes immediately. If necessary, testify in court to make the charges stick! Get those "buzzers" out of aviation and out of your hair!



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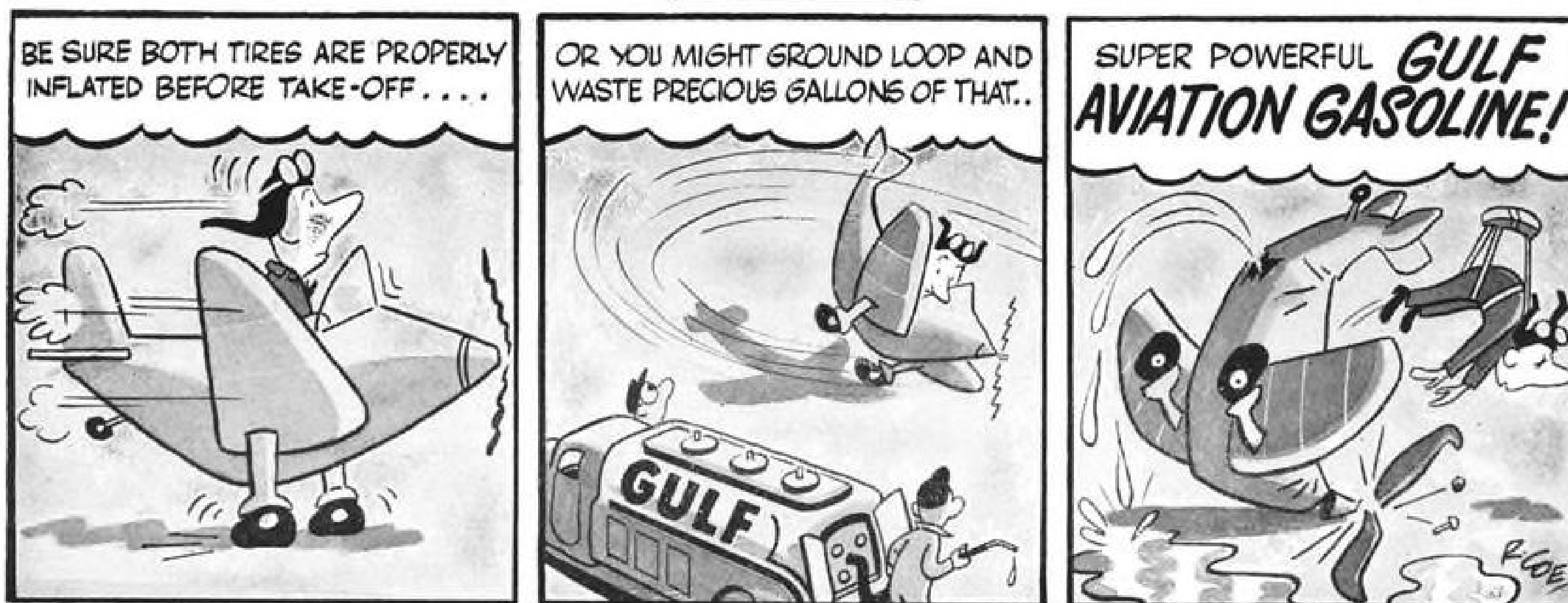
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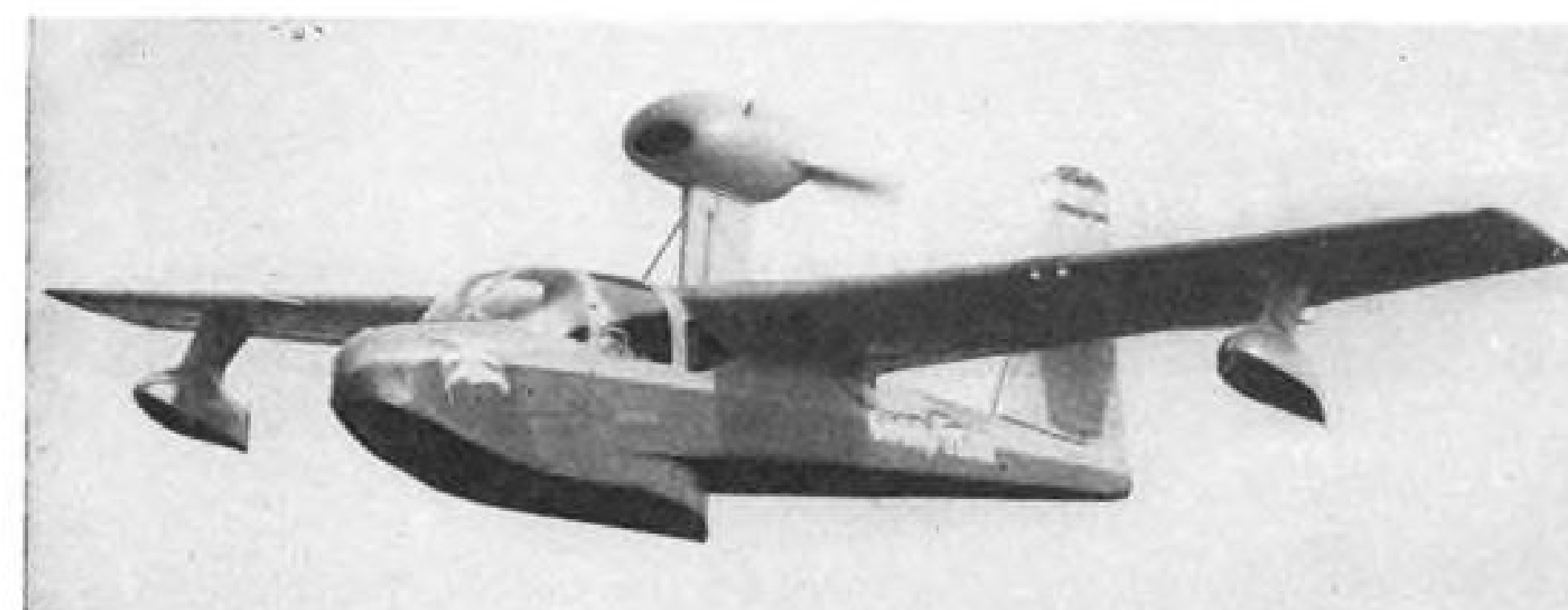


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## SALES & SERVICE



PLANING-TAIL HULL design of new Goodyear GA-22 amphibian helps water-handling.



CROSS-WIND LANDING GEAR installation tucks into shoulder-high wing in two folds.

## Goodyear Shows GA-22 to Services

Military orders for new four-place amphibian could drop price to level attractive to sportsmen pilots.

A trim new four-place amphibian has been dodging driftwood on the Potomac River in neat water landings making demonstrations from Washington National Airport. The demonstrations are aimed at selling the craft to the military services for utility and rescue work.

While no definite military price has been fixed for the plane, estimates are that it could be offered at a price of around \$20,000 if an order for as many as 100 were placed.

Designated GA-22, the new plane is the latest in the Goodyear Aircraft Corp. series of small amphibian developments which began about the close of World War II. Now, with more military emphasis on small liaison-type fixed-wing and rotary-wing craft, Goodyear is probing the military market for a water-and-land plane that offers higher performance than anything previously offered in its class.

► **Come a Long Way**—A demonstration flight for two AVIATION WEEK writers showed that the GA-22 has come a long way from the earlier GA-2 amphibian, in which one of the writers had flown at Akron more than three years ago. Despite the fact that the new plane carries four persons instead of three, it has been slicked-up aerodynamically. Cruising speed and top speed are improved considerably at the expense of little additional power.

Goodyear now quotes a 133-mph. top speed, and 119-mph. normal cruising speed, as compared to 125-mph. top and 110-mph. cruising speed for the earlier plane.

An alternate version, using the Continental E-225-8 engine rated at 225 hp. at 2650 rpm, instead of the 205-hp. version of the Continental E-185, is expected to cruise at 130 mph. and make a top speed of 144 mph. These figures

presumably were quoted to Air Force, Army and Navy plane shoppers.

The proposed plane would have a 1085-ft./min. rate of climb, and 18,300-ft. service ceiling, would take off to clear 50 ft. obstacle in 1050 ft. on land, and make a 23-sec. water takeoff run, of about 1200 ft.

Landing gear retracts into the roots of the wing, in a double-folding operation, which needs to be faster than it is. But once the retraction is made, the GA-22 is an extremely clean airplane.

Visibility is exceptionally good with the cabin placed well forward of the wing, and with the engine installed in a nacelle on a pedestal on wing top.

► **Design Features**—Other design niceties of the all-metal amphibian include: NACA planing tail hull, leading edge wing slots, and slotted flaps; excellent water taxiing maneuverability with the aid of a Hartzell reversible pitch propeller and a sea-rudder which forms a fairing about the tailwheel, and is steered on water as the tailwheel is steered on land; Goodyear castoring crosswind landing wheels which are becoming increasingly popular on small business and personal planes; and a cabin arrangement which makes possible a quick conversion from all-passenger to all-cargo, or to litters for rescue.

Goodyear surveyed the personal plane market potential of the earlier GA-2 amphibian, and decided not to build it for a commercial plane market. But if it could write off enough of the development costs of the GA-22 in military contracts, the Akron manufacturer would have a very attractive commercial sales item that a lot of sportsmen pilots would like to own.

## BRIEFING FOR DEALERS AND DISTRIBUTORS

► **New Field Rating Scheme**—In an effort to boost appearance and service of New England private airports, the New England Council is setting up a rating plan to reward cooperating operators annually on the basis of physical appearance of their fields and adequacy of service.

► **Plane Versatility**—That the airplane is a busy sales and service tool is shown in new CAA listings of some 2000 firms doing industrial flying, over 100 companies doing general charter work with planes of over 12,500 lb., and over 2500 firms handling general charter and transportation services.

► **New School Appointments**—Aviation Activities Co., Dallas, has negotiated with Maj. W. F. (Bill) Long to operate Dallas Aviation School at Love Field. W. L. (Cuz) Ross is the school's new managing director.



## EXPERIENCED AND JUNIOR ENGINEERS

THE ENGINEERING DIVISION of the Boeing Airplane Company is presently accepting applications for long-term employment in the following and allied fields of the engineering profession: *Mechanical, aeronautical, electrical, electronic, civil, acoustical, and structural, as well as physicists and mathematicians.*

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The history of the Boeing Airplane Company is synonymous with the development of the aircraft industry. The initial concept of the company, based on the sincere belief that "our job is to keep everlastingly at research and experiment," has been proved by its accomplishments. The results have set an unparalleled pace for research and development in this industry.

Please direct inquiries and requests for application forms or the brochure, *As the Twig Is Bent*, to the Engineering Personnel Unit, Boeing Airplane Company, 7752 E. Marginal Way, Seattle 14, Washington.

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## AIR TRANSPORT

### Scheduled Passenger Copters for N.Y.?

**Examiner backs bid of New York Airways; service would include mail and property.**

The first regular helicopter passenger service in the nation may begin at New York in another 18 months if the Civil Aeronautics Board accepts recommendations made last week by one of its examiners.

Examiner Ferdinand D. Moran gave New York Airways, Inc., the edge in a two-way competition for the right to carry persons, property and mail on scheduled copter flights in the New York metropolitan area, with emphasis on service between the major New York airports.

Only two other such areas—Los Angeles and Chicago—now have helicopter mail and cargo service. And they probably will not get passenger helicopter service before the New York route is opened.

Moran's report does not mean that NYA has won, yet, but it does give the recommended applicant a strong inside position for the Civil Aeronautics Board's final decision.

National defense arguments in favor of the service were never as strong as now. Commercial helicopter experience and high utilization gives the military vital maintenance and cost information it can't develop on its own copters. Military copters seldom operate on anything close to a schedule, and usually stand idle except in occasional emergencies. National defense and civil defense also would gain from having efficient commercial helicopter operations available for any emergency.

Moran and many other proponents of this New York service say commercial helicopter service will eventually replace all fixed wing planes on feeder-type routes.

The examiner picks NYA over Metropolitan Air Commuting, Inc. NYA is given preference because it is financed entirely by common stock and its backing is strong. Other than the financial difference, Moran says the companies are alike in potential ability to give the required service.

Examiner Moran recommends that the Board give NYA a temporary (five year) certificate of public convenience and necessity covering:

- **Metropolitan area**, including LaGuardia, N. Y. International (Idlewild) and Newark Airports and a Manhattan heli-

port, plus four clover-leaf segments going out of LaGuardia and Newark airports to serve 35 suburban points. The four suburban routes cover 397 miles, the three shuttle routes 43 miles.

- **Any point within 50-mile radius** of LaGuardia and Newark airports. This gives NYA flexibility to make frequent changes in the "air mail experiment." Los Angeles Airways got the same exemption giving it this flexibility so it wouldn't have to file with CAB for every change needed by the Post Office or other users.

- **Passengers shuttle service** between LaGuardia, N. Y. International and Newark when mail and property service has gone on for long enough to assure proper handling of passengers. This would be the first time that scheduled passenger helicopter service was permitted although Los Angeles Airways has filed for it also.

Examiner Moran favors the route and service pattern proposed by NYA as being simpler than MAC's and flexible enough for study and operation of the experimental service.

► **NYA Finance Backing**—NYA proposes

to finance entirely by common stock, except a convertible \$85,000 note going to President John L. Senior. Of the \$1,100,000 sought to be raised by NYA, more than \$900,000 had been subscribed at the time of the hearing.

Among NYA's stockholders are Laurance S. Rockefeller, Sr., William A. M. Burden, Mesmore Kendall, Charles A. Dana, Jr. and Robert W. Dowling.

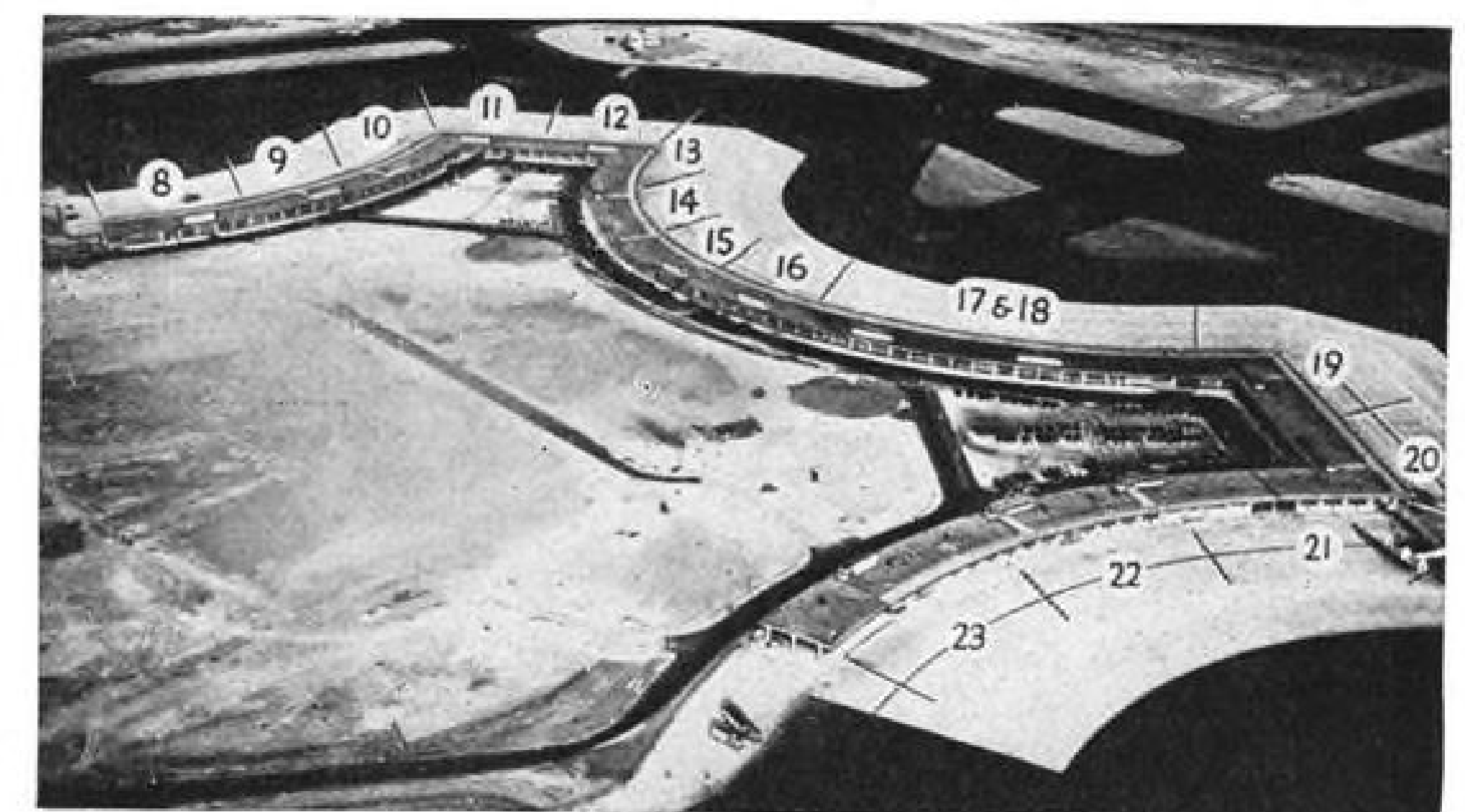
The investment banking firm handling this capital by private stock subscription is Smith, Barney & Co., which states that it anticipates no trouble in raising the comparatively small amount of capital still required.

NYA's pro forma balance sheet shows liabilities and capital stock of \$223,500, plus capital surplus of \$985,000. Assets are \$1,100,000 plus an C-51 helicopter.

Senior is NYA's original promoter and present president. He first considered financing the whole company himself. But counsel and he decided to bring in a small group of investors.

Concludes Examiner Moran: "By comparison with MAC, NYA appears to be more strongly sponsored company financially and for this reason it is concluded that the comparative public interest requires the selection of NYA."

► **MAC Finance Scheme**—After going over the complex capital structure and



**BOSTON'S NEW FACILITIES**

This aerial closeup of the new apron building dedicated at Boston's Logan International Airport locates airline and other facilities featured at the new terminal. The numerals correspond to the building's gate positions. Gates 8, 9, 10—International passenger area; 11—Trans Canada offices, Allied

Maintenance, Pan American; 12—United Air Lines; 13—Trans World Airlines; 14—Northeast Airlines; 15—bank, photographer, state police, snack bar; 16—barber shop, snack bar, coffee shop, newsstand; 17, 18—American Airlines; 19—restaurant; 20—Eastern Air Lines, Wiggins; 21—offices; 22—express; 23—P.O.



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proposals of Metropolitan Air Commuting, Moran says "because of the vagueness of MAC's financial plans it is difficult to envisage what the financial condition of that company would be subsequent to completion of its financing. And by reason of the merger of Air Commuting with Metropolitan it is also difficult to judge what future investors in MAC would get for their money."

Moran points out that MAC has only \$304,425 of new money capital (prior preference stock) definitely committed by 17 subscribers. Estimated capital cost to set up MAC's radial route proposal would be \$2,378,000 or for its clover leaf proposal, \$1,563,000.

MAC's balance sheet of Aug. 31 last year showed book value (capital) of \$40,779, and working capital of \$683. Assets included \$13,471 of helicopter extension and development.

Subscribers to the prior preference stock at a final \$100 a share would get for each 50 shares a right to purchase 15 shares common stock at \$1 a share. In other words, for the commitment of approximately \$5000 the subscriber could for \$15 buy 15 more shares of common valued at \$750. This extra right is only a standby commitment, however, and even if exercised would supply only a part of the money needed to launch the company properly on either of its proposed systems.

MAC proposes to raise the rest of its equity by public offering of equity securities up to one-half of its capital requirements. This offering is a commitment by investment houses Burnham & Co. and Bear, Stearns & Co., if MAC gets CAB certification. The rest of the financing would depend on an equipment loan, probably from the Chase National Bank.

Examiner Moran concludes, "the ratio of debt to equity that would characterize MAC's capital structure . . . one to one . . . would appear to work against the desirability of such a financing arrangement. . . . The same reasons against a high debt ratio appear equally applicable to MAC's plan for a relatively large preferred stock issue, especially when combined with a prior preference issue. It raises the question of whether the subsequent offering of MAC's common stock would have marketing appeal other than speculative, should MAC exercise its option to issue \$300,000 worth of prior preference stock and obtain a bank loan of \$1,200,000."

► **The Plan**—NYA's proposed service is adopted substantially without change in the recommendation of Examiner Moran. Basic route is a triangular shuttle run between Newark, LaGuardia and N. Y. International, with service also from each direct to a Manhattan terminal. Then there are four clover leaf patterns going into the suburbs, two

from LaGuardia and two from Newark. From LaGuardia there is a loop of 11 towns, going north to Pleasantville, N. Y., east to Bridgeport, Conn., and back southwest to LaGuardia.

Also from LaGuardia there is a round loop of eight cities on Long Island, plus Staten Island.

From Newark, one triangular loop of seven New Jersey towns goes as far south as Asbury Park and west to Princeton. The last loop of nine New Jersey towns is circular, going north to Englewood and west to Morristown.

► **Service Growth**—Here is the approximate timing NYA expects on development of its proposed New York area services:

- **Oral argument** should take place about December or January.
- **CAB decision** might come about March 1951.

- **Operation** of the entire system might be inaugurated by October of next year or later, if CAB's decision comes in March and is in line with the plan presently proposed. Six months from date of authorization NYA hopes to begin services.

- **Mail and Property** might be moving over the entire system by Jan. 1951—allowing for moderate delay in CAB proceedings and company organization.

- **Shuttle Passenger Service** between the three airports might start before the end of next year. That depends on how smoothly the mail and property service goes. By the end of next year or early 1952 helicopter shuttle service may start.

► **Equipment**—Tentatively, NYA proposes to use six Sikorsky S-52-2 three-passenger jobs, plus three Bell 48 10-12 passenger Feederliners or Sikorsky S-55 10-passenger copters.

NYA would start out carrying only mail and property. Probably it would later introduce scheduled passenger



#### CLOSING THE DEAL

Thomas E. Grace (left) Slick Airways' president signs the first contract for delivery of three Douglas DC-6A Liftmaster cargo planes while Nat Paschall, Douglas Aircraft vice president-commercial sales beams approvingly.

service in the S-52 first. (Los Angeles Airways has an S-55 on order and in its passenger proposal to CAB LAA says it would operate the S-55 for a year on mail and property before putting passengers in it.)

► **Examiner's Case**—CAB Examiner Moran makes a lengthy and strong case proving that benefits from an experimental New York helicopter service will outweigh the cost or the operation to the government. He adds that the service is required by the public convenience and necessity.

The cost of helicopter service in Chicago was \$0.0066 per letter when that service had been going less than a year. In Los Angeles, after 2½ years, cost was equivalent to only \$0.0044 or less than half a cent a letter. These amounts, says the examiner, "compare with revenue which would approximate 6 cents per letter."

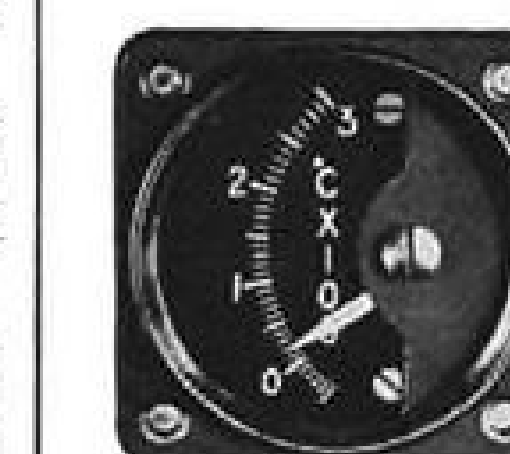
Analyzing data submitted by the Post Office and the applicants, Moran concludes:

- **Air Mail** is useless now for distances up to 300 or 400 miles.

- **But Helicopter Service** the first year of operation at Los Angeles expedited 91.5 percent of the mail carried. In a report to the Second Assistant Postmaster General, it was stated that the "bulk of the 1,510,617 pounds of air mail

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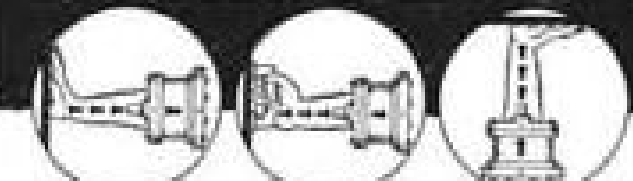
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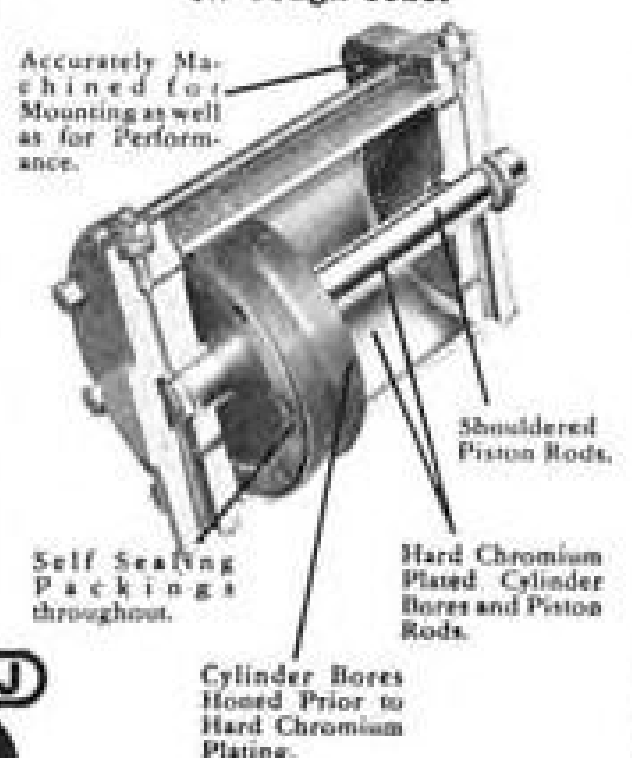
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transported were advanced in delivery from 4 to 19 hours."

Larger, better helicopters are coming. They, together with passenger and freight revenues, "will substantially offset the expenses involved in support of the operation through mail pay," says the CAB Examiner.

No interference with fixed-wing operations would result from helicopter operations, according to a CAB decision in Docket No. 1642 that denied Air Commuting's proposal for inter-airport and airport-to-Manhattan service using fixed wing planes.

## Jets in Traffic

Dayton tests check radar ability to merge jets and piston craft in pattern.

Dayton—The first full-scale test to determine feasibility of mingling jets and conventional planes in the same approach and landing pattern has been concluded at Wright-Patterson AFB.

Observers who watched the operations, held twice a day over a three-day period, felt that results were successful for a preliminary trial.

The initial test presented practical application of basic operating principles for control of air traffic in the terminal area, utilizing radar, with and without airborne beacons, navigational facilities and landing aids.

► **Important Question**—The question of such control has long been considered important by aviation experts, and was discussed at length by airline engineers attending an International Air Transport Assn. symposium at Asbury Park, N. J. last May (AVIATION WEEK May 29).

The recent demonstration was held at the recommendation of the Operational Policy Group (better known as Special Working Group 5) of the Air Traffic Control and Navigation Panel, Air Coordinating Committee. Group 5 has been active for some time in designing the implements and setting up certain operating principles to be used in the "transition period" of the Common System.

Cooperating with the policy group in the display were the Air Navigation Development Board, the Technical Division and Evaluation Center of the CAA, the Navy and All-Weather Flying Division of USAF.

► **Three-Day Tests**—Operations were conducted at morning and afternoon sessions on three days. Actual instrument weather of 500-ft. ceiling and 1-mi. visibility prevailed during the first demonstration. Approximately 20 aircraft were flown in each session. They were a varied assortment of military, commercial, corporation and private-

type ships with pattern speeds ranging from 110 to 180 knots. Included were C-97s, F-80s, C-47s, C-54s and many others.

The aircraft were picked up and identified on long-range radar (AN/CPS-6) and stacked in one of two holding patterns. These stacks were several miles apart and ships were layered at 1000-ft. intervals. The lowest altitude in one was 3500 ft, 4000 in the other. Conventional 75mc. fan markers on range legs were used as holding points, but any radio fix would have served the purpose. The ships were taken off the bottom of alternating stacks and fed into a "gate" or common supply point, at controlled intervals.

The terminal traffic control radar AN/CPN-18 took over the planes at this "gate" and vectored them around the traffic pattern and onto final approach, where they were turned over to GCA. By varying the aircraft tracks in this pattern, correct spacing for final approach was obtained.

► **Mechanical Interlock**—A featured part of the demonstration was a mechanical interlock system installed between the two radar control stations to provide positive and visual separation of aircraft. Planes were assigned flight numbers which appeared alongside the appropriate altitude figures and a system of lights—red and green—indicated occupied or open altitudes. Controllers could tell at a glance the altitude of any ship and which levels were open.

Operators at the radar scopes were CAA personnel normally employed in control towers and traffic centers in Chicago, Washington, New York and Indianapolis. Until recently many of them



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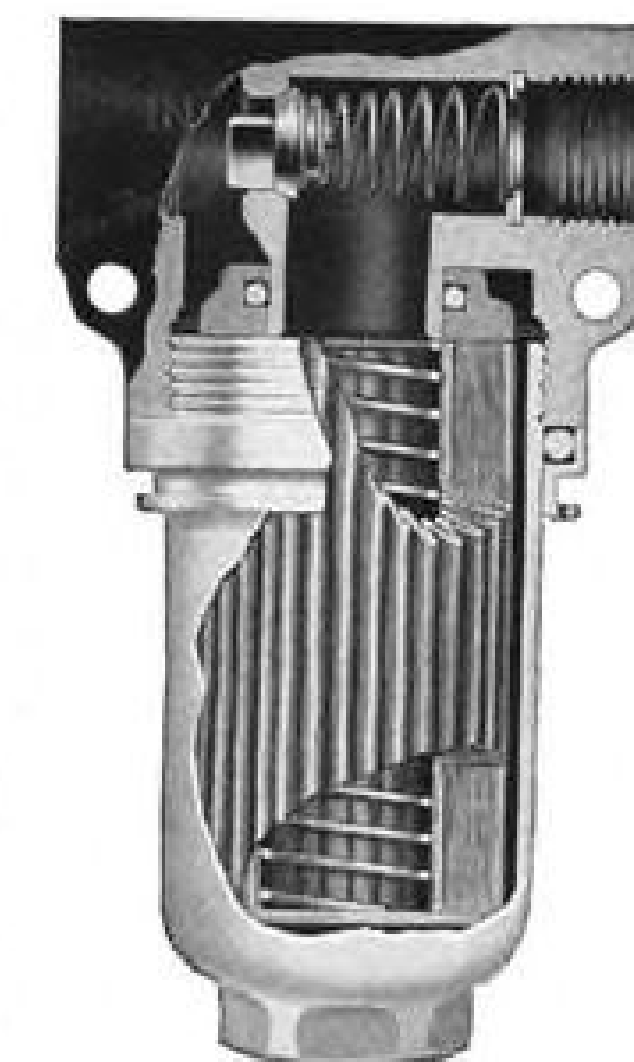
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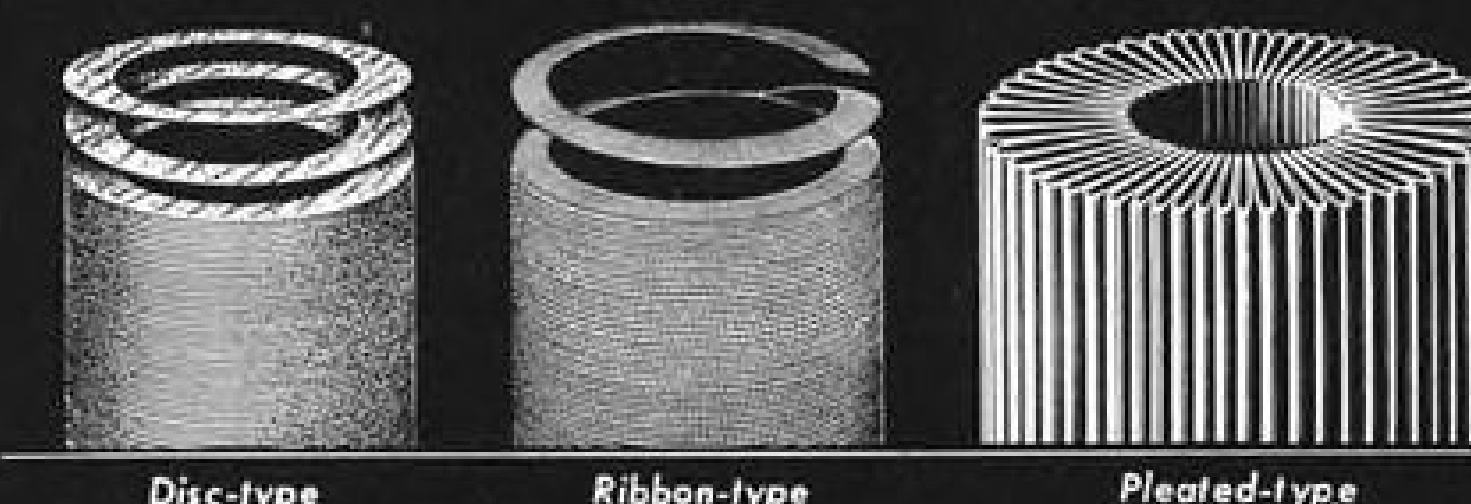
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FASTEST THING IN *Aircraft* FASTENINGS

had had little or no familiarity with radar traffic control. Each man therefore had been given about 50 hours training on the equipment. Use of these people was intended to show the adaptability of center and tower personnel to this type of operation.

The entire operation was recorded with Esterline-Angus pen recorders and Brush recording tape. These records will be tabulated at a later date. Statistics available soon after the tests indicated that aircraft were landed with an average interval of just under 2 min. Occasionally a 4- or 5-minute gap occurred and there were some spacings as close as 20 seconds.

► **Three Methods**—Three methods were available for identification of aircraft:

- Identifying turns.
- Airborne beacons.
- VHF/ADF.

The ADF, actuated by the ship's transmitter, produced a streak of light on the radar scope through the pip of the airplane in question. Several planes were equipped with beacons and these could produce various patterns on the radar scope, eliminating questions of identification.

No attempt was made to proclaim the system a finished product. Those responsible for the set-up were more interested in determining whether the fundamentals were correct and to see where refinements could be made. A critique was held at the end of each day for the purpose of getting the opinions of the observers and also to answer any questions.

Among those responsible for the smooth functioning of the tests were Col. J. Francis Taylor, chief, All-Weather Flying Division, USAF and CDR. A. W. Wuerker, USCG, chairman of Working Group 5, Roys Jones, I. Hilton of the CAA and Col. S. A. Mundell, USAF member of ANDB. The mechanical interlock was worked up by S. P. Saint assisted by Frank White, both of ATA.

## BOAC-SAA Pact Sets Africa Routes

A new agreement between British Overseas Airways Corp. and South African Airways changes the England-South Africa route pattern.

BOAC (which used to fly Solent flying boats down the east side of the Dark Continent to Johannesburg) starts Nov. 7 flying the west side with pressurized Handley Page Hermes. South African, which used to operate a west-side route, now starts operating the east side, using Constellation 749As. Both will fly London-Johannesburg three times a week, with no night stopovers.

The BOAC-SAA agreement calls for

mutual withdrawal of flying boats from this service.

Now that BOAC has dropped flying boats, all its worldwide services will operate out of London, instead of partly from London and partly from Southampton, as formerly.

The new British Overseas route is via Tripoli, Kano, Brazzaville in French Equatorial Africa, and Livingstone (Victoria Falls). New SAA route is via Rome, Khartoum and Nairobi.

By serving Brazzaville, the BOAC Hermes will pick up new traffic from an important central African area.

## New Puerto Rico Airport Planned

(McGraw-Hill World News)

San Juan—The Puerto Rico Transportation Authority has submitted a project to the planning board asking for an allocation of funds amounting to \$750,000 for the construction of a new airport at the city of Ponce, during the next fiscal year. Plans for the construction of this airport will be ready by December 1950, and the project will be financed with federal and insular government funds.

## Qantas Plans New Australian Service

Johannesburg—Qantas Empire Airways expects to start a new direct air service between Australia and South Africa across the Indian Ocean next year. Constellations or DC-6s will start flying from Sydney and will stop at Melbourne, Perth, the Cocos Islands, Mauritius and Johannesburg.

## ACTA Cracks Down On Violators

Two nonsked ticket agencies that advertised heavily, but not always too carefully, may soon be out of business. They are Columbia Air Coach System and the Flying Irishman agency. Several nonsked carriers, members of the Air Coach Transport Assn., had already brought charges against these agencies for alleged credit violations, and misrepresentation to passengers.

ACTA members have refused to accept further tickets issued by either agency, but are still honoring tickets bought from Columbia and Flying Irishman prior to their expulsion from ACTA associate membership.

Meanwhile, the large irregular carriers represented by ACTA are rushing a plan to submit to the Civil Aeronautics Board by Nov. 2. Under it, they

## Hartman 120-volt DC relays take the sting out of electrical problems in Northrop Scorpion



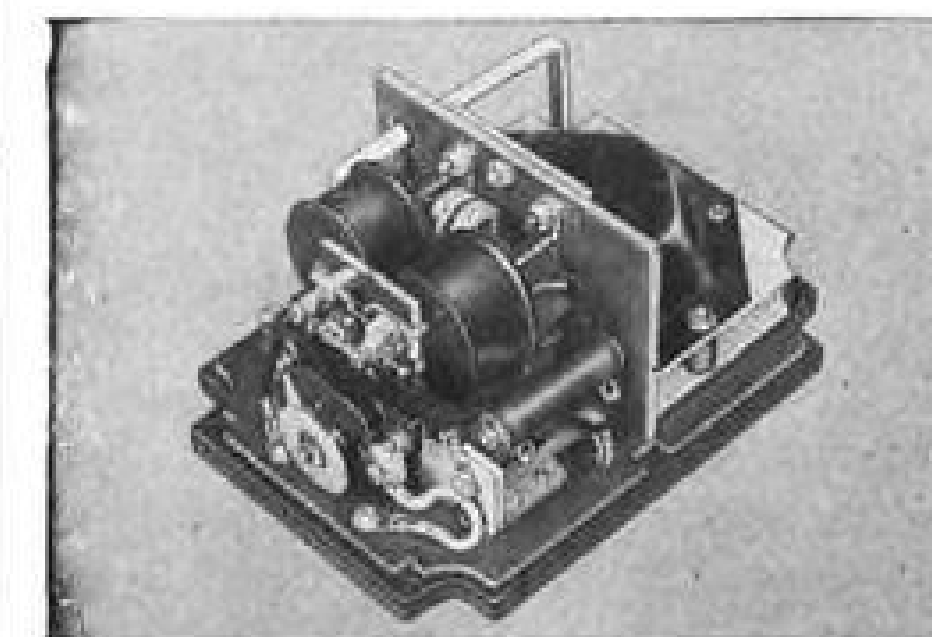
Photo: Courtesy Northrop Aircraft, Inc.

High-voltage electrical systems cut space and weight—all-important considerations in a high-performance aircraft such as the Northrop F-89 Scorpion. But, heretofore, problems in breaking large currents at the higher voltage have prevented use of the more efficient 120-volt DC system.

Solution by Hartman engineers of problems concerning interrupting capacity, operation at altitude, welding of contacts and difficulties of control, has resulted in installation of the improved equipment in the Northrop F-89... the first production airplane to employ a 120-volt DC system. In addition to seven 120-volt relays of four different types, the F-89 is also equipped with six 28-volt Hartman relays of three different types.

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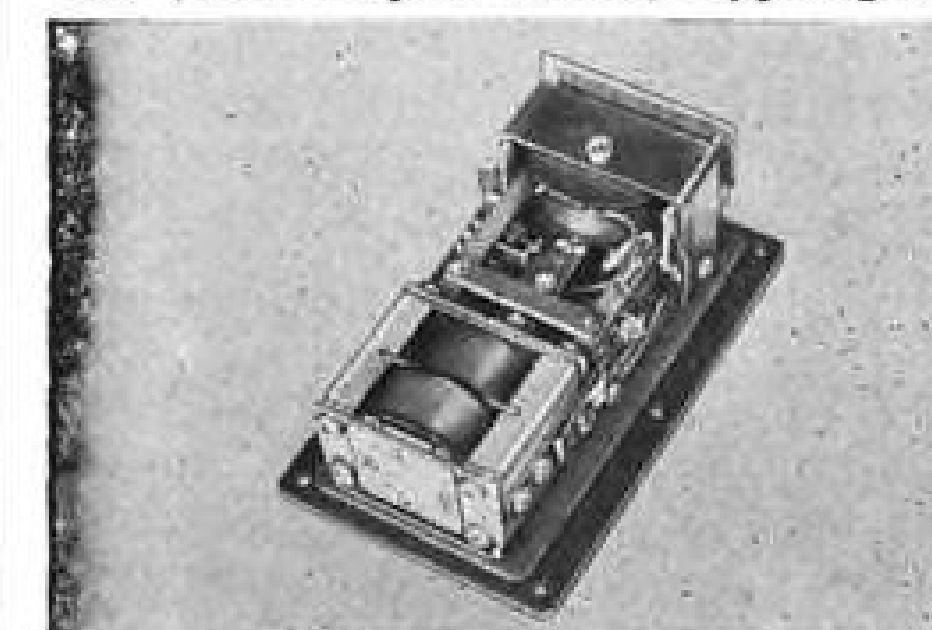
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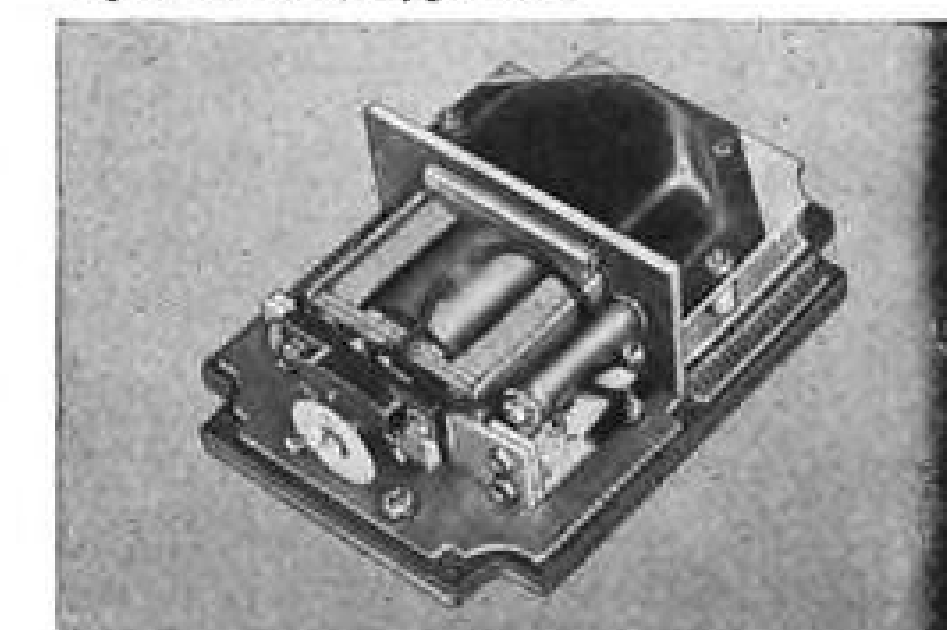
Reverse Current Cutout—250 amp, 120 volts DC (USAF Spec. 32649, Type Q-1)



Overvoltage Relay—120 volts DC (USAF Spec. 32652, Type E-3)



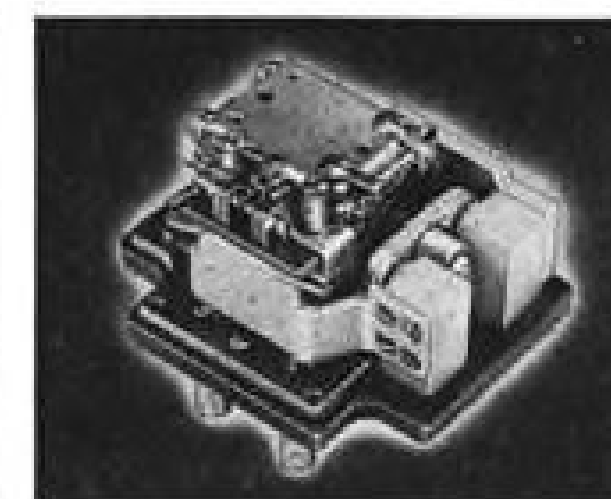
Generator Field Relay—120 volts DC (USAF Spec. 32655, Type M-3)



External Power Relay—250 amp, 120 volts DC (Can break 2500 amps, 120 volts)



Reverse Current Cutout—600 amp, 28 volts (AN3025-2)



Jet Starter Relay—28 volts (AN3391-1)



Overvoltage Relay—28 volts (USAF Spec. 32591, Type E-2)

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MANSFIELD, OHIO



would keep operating on a profitable basis. Under CAB Draft Release 43, these nonskeds would be held to a limit of three trips a month between any two big cities. ACTA has asked CAB to delay the oral argument to a later date, while ACTA members and President Amos Heacock draw up a working system under which CAB would recognize them as a definite group of carriers.

## SHORTLINES

► **Air France**—Carrier, now 100-percent state-owned, may soon sell 30 percent of its stock—15 percent to corporations and 15 percent to individuals. Stock-owners would be guaranteed minimum dividends of 5 percent annually for 15 years. . . . Company has 33 DC-3s, 32 Languedocs, 28 DC-4s and C-54s, 13 Constellations, 3 de Havilland Dominies, 2 Catalinas, and some Junkers 52s on lease.

► **All-American Airways**—Flew 7½ million revenue passenger miles the third quarter of this year, compared with 4½ million a year ago. Number of passengers flown jumped 58 percent to 53,634. Yet AAA reduced its employees from last year's 463 to the present 421. . . . Company has passed the 25-million passenger revenue mile mark since starting operations 20 months ago between 45 cities.

► **British Overseas Airways Corp.**—Starts routing its Europe-South America service via Madrid, Spain, as well as Lisbon, Portugal, this week. Two flights a week will go through Spain, one through Portugal.

► **California Eastern Airways**—Pays off \$140,000 due creditors this week, thus becoming eligible for self-support without court jurisdiction.

► **Capital Airlines**—Directors held their latest quarterly meeting in Detroit, with the next meeting scheduled for Washington and the one after somewhere in the South, perhaps Birmingham. Idea is to meet management and see operations in company territories, as some other lines have started doing.

► **Cuba Aeropostal**—Has permission from the Cuban National Transport Commission to establish a nonscheduled cargo and express service Havana to Guatemala City. Permit is for indefinite duration if used, but expires next Mar. 25 if service is not started. Cuba Aeropostal's permit is contingent on similar permit from Guatemala.

► **Delta Air Lines**—Made a net profit of

\$63,000 in September, compared with \$10,000 a year ago. September is generally a bad month, Delta says.

► **Gulf Aviation Co.**—Is a new airline set up by Arab merchants of Bahrain Island in the oil-rich Persian Gulf. An ex-RAF pilot leads the line.

► **KLM Royal Dutch Airlines**—Will soon place U. S. orders for new planes, according to a statement by Vice President L. F. Slotemaker.

► **Lineas Aereas Costarricenses**—Has a CAB temporary, three-year permit to carry persons, property and mail between San Jose, Costa Rica and Cabez, Nicaragua and Miami, Fla. . . . LACSA is scheduling two passenger roundtrips a week plus as many cargo runs as demand warrants.

► **Northwest Airlines**—Resumed scheduled service to war-torn Seoul, Korea, with a plane leaving Minneapolis 1:30 am. Friday and due to arrive Kimpo Field, Seoul, 1:40 am. Sunday. . . . Company has appointed Robert J. Morgan European sales director. He was formerly the Orient sales manager.

► **Pan American World Airways**—Starts daily tourist fare service to Bermuda Nov. 1 at \$85 a roundtrip. The New York-Bermuda DC-4 run was inaugurated in January on Tuesdays, Wednesdays and Thursdays only. First-class service continues four flights a week. . . . Company has had a 25-percent drop in travel from Latin America to Miami following the freeze on alien passport visas. PAA officials expect the dropoff to last only a few weeks while foreigners bring visas up to date. . . . Company is operating a 100-ton furnishings airlift—this time to the 200-room Hotel Varadero Internacional, San Juan, Puerto Rico.

► **Slick Airways**—Ton miles carried were up 123 per cent in August and 107 per cent in September, compared with last year.

► **Transworld Airlines**—Asks CAB for permission to stop at both Santa Fe and Albuquerque on the same flights. But Pioneer objects, saying its own service would be damaged more than TWA's would gain.

► **Western Air Lines**—Flew 1,432,352 charter revenue miles Jan. 1 to Oct. 21, producing 51 percent more charter revenue than last year. . . . Board of directors had its third-quarter meeting at Portland, Ore., in line with a policy of familiarizing officials with its major territories.

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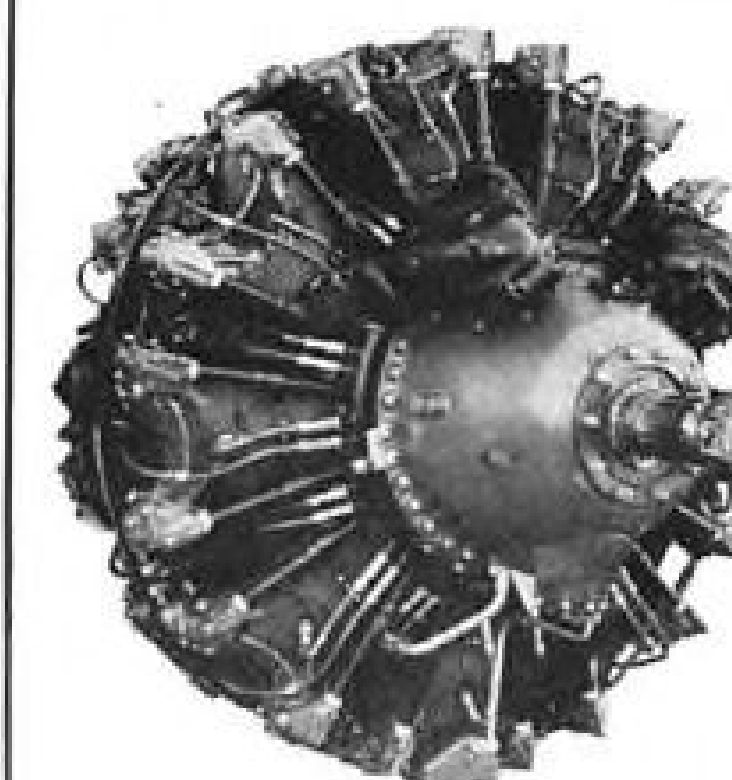
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## WHAT'S NEW

### New Books

In a candid new book, *Air Power: Key to Survival*, Alex de Seversky again takes to the public his case for the "ideal" air force. No doubt many readers will be intrigued with the arguments de Seversky outlines on how much more economically than the present defense program true air power can guarantee the peace or wage any necessary war. The present program, he claims, is based on fighting the next war the same back-breaking way we won the last one.

Much of the arguments presented for an intercontinental air force are reiterations of those made by de Seversky in his previous writings. But they are polished up and made more vivid when related to actual World War II operations. The B-36 is one of the few shining lights in our present procurement, says the author. He sees the plane being refined to cover a range of 15,000 mi. The extreme weight limit in the big bombers, he states, is 500,000 lb., at which point global range will be attained.

An important part of the text is taken up with evaluating the nuclear fission bomb. The author's on-the-spot personal surveys of the damaged cities of Hiroshima and Nagasaki are used to tone down some of the end-of-the-world thinking surrounding use of this new weapon. Air power, says de Seversky, is still the major factor. Without air supremacy, no country can win any war regardless of how many A-bombs it may have; with air superiority the weapon is secondary.

Published by Simon & Schuster, 1230 6th Ave., New York 20, N. Y., 376 pages including index, price \$3.50.  
—E. J. B.

### New Addresses

Gordon D. Brown & Associates, makers of aircraft cargo and passenger fastening equipment, have moved to larger offices at 407 K Commercial Center St., Beverly Hills, Calif. The factory remains at 333 N. Foothill Rd., Beverly Hills.

Frontier Airlines, Inc., at Stapleton Airfield, Denver 7, Colo., is the new correspondence address for the consolidated airlines formerly known as Challenger Airlines Co., Monarch Airlines, Inc., and Arizona Airways, Inc. Officials of the new corporation are: Hal S. Darr, president; Donald A. Duff, vice president, traffic-sales; Ray M. Wilson, vice-president, operations; C. A. Myhre, vice-president-treasurer; H. O. Nelson, regional vice president; and E. N. Levin, secretary.

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AVIATION WEEK, November 6, 1950

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## EDITORIAL

### Those Secret Backlogs

As any one of our readers already knows, we are all for national security, but the military services are going too far toward unreasonable censorship.

The latest example of this trend appears to be an attempt to stifle company backlog figures.

For some reason, plant representatives of both the Air Force and the Bureau of Aeronautics—in the East at least—are quashing requests of manufacturers to release backlog figures to the public.

In several instances which have come to our attention, our requests for aircraft backlogs have been referred by company publicity men to plant representatives of the two services. In each case, these representatives have said no.

An outstanding instance is Grumman's polite refusal to make public not only backlog, but sales figures as well, to the New York Stock Exchange.

This was on orders of the company's BuAer plant representative.

The Stock Exchange has asked the Air Coordinating Committee to investigate.

Unless there is constant vigilance of this creeping trend toward unreasonable censorship of legitimate business information, you can be sure it will continue unabated.

The services, led by the Department of Defense, should waste no more time reaching agreement on what information can be released about our armament program, and then demanding that all government spokesmen follow the same rules, so industry will know where it stands.

### Smart Advertising

Los Angeles newspaper want-ad sections are sprinkled with ads by non-scheduled air carriers.

The certificated, scheduled carriers run their display ad space in other sections of the papers.

Last week, while we were visiting this West Coast nonscheduled airline center we were startled to see one of the classified ads in the bargain travel section reading thus: "Scheduled Air Coach via American Airlines TWA—DC-6 Pressurized Planes, Daylight Flight, 6 hours, 55 minutes to Chicago; 10 hours to New York. Chicago \$85; New York \$110. Be sure you are on a scheduled line. Only TWA and American fly scheduled air coach east."

Who paid the bill for this advertising? Neither American nor TWA. It was National Travel Service, presumably an independent travel agent who operates on the same commission basis every other travel agency receives.

Thus, the bargain travel hunter finds these two scheduled coach carriers plumped right in the middle of the advertising section where the non-scheduled competition advertises. Only coach rates are shown. The first class fares are not mentioned here to confuse the bargain hunter. The potential traveler is given only one phone number to call for both airlines, and this is good because many first riders are timid or ignorant about the process

of making reservations, and both TWA and American transcontinental coaches are so crowded that the passenger is quickly and simply assured of accommodation on the airline that can accept his reservation soonest. The TWA and American telephone loads are eased, too.

It isn't often a travel agency uses such enterprise and ingenuity. The regulations should permit an agency who spends advertising money on one or two airlines' services to get back part of his expenditure from the carriers, in addition to the usual commissions on ticket sales.

### Relax, But Don't Overdo It

The Southern Pacific Railroad has a double-size billboard, brilliantly lighted, that you can't help seeing as you drive into San Francisco from the airport.

It shows a picture of a man reclining in a coach seat with his legs stretched full out. The sole message on the rest of the billboard says:

"Next time, take the train. **RELAX.**"

It was shortly after 8 pm. Pacific Time the other evening as we passed this impressive health admonition in the airport bus into town. We had taken off from Denver about 3:45 pm. Mountain Time. The sign haunted us for days, so we picked up timetables for the two railroad routes between Denver and San Francisco.

We learned that on the Western Pacific we could have left Denver and started relaxing at 8:40 am, instead of 3:45 pm., and at the time we passed the San Francisco billboard we'd still have been relaxing an hour east of Salt Lake City.

Of course, we would have had to relax all of that night on either coach or Pullman and by lunch time the next day, around 12:20 pm., we still wouldn't be any closer to the Southern Pacific's signboard in San Francisco than the beautiful city of Sacramento—if the train was on time, that is. This means that we would have relaxed most of the afternoon hours, too, before we reached San Francisco, at 4:50 pm. Obviously, if the train had been late, we would have had even more time to relax.

The Union Pacific and Southern Pacific together have a joint service, too, between Denver and San Francisco.

The "Pony Express" (no kidding!) leaves Denver at 5:30 pm., about two hours after United Air Lines' popular mid-afternoon DC-6 flight, and reaches Ogden 13 hours later, giving ample time for the passenger to relax.

The resting passenger then relaxes all that day and all of the next night, arriving in San Francisco at 7:35 am. the next morning.

If he started relaxing in Denver on Sunday afternoon, for example, he would complete his relaxation on the Southern Pacific at 7:35 am. Wednesday. But there's also a streamliner leaving Denver at 7:55 am., reaching Frisco at 6:50 the next night.

Not so much relaxing, though.

We believe in relaxing, but urge the busy business man not to overdo it.

—Robert H. Wood



## 1/2 YARD TO Touchdown!

The first team is coming in... via Fairchild Packet... and the Airborne Trooper is headed for a touchdown in the drop zone.

He is carrying the ball now in an assault play that is the culmination of the most carefully planned teamwork imaginable.

For behind this hard-driving trooper are thousands of hours of training and practice and co-ordination with countless other well-trained experts: pilots, plane crews, ground technicians

and a host of other U. S. Air Force and U. S. Army strategists and tacticians.

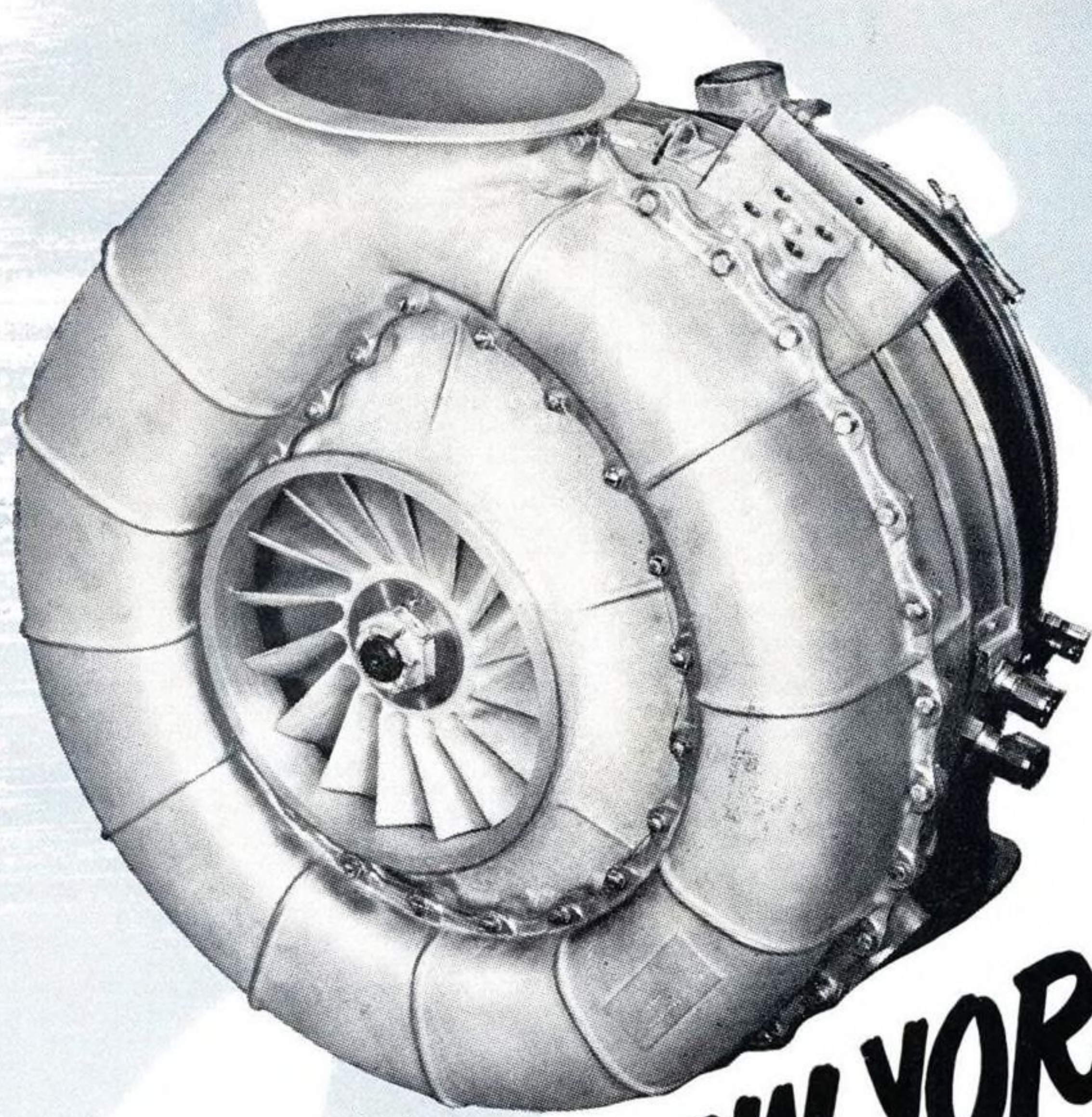
Tracing the team members back even further than that, there are the engineers and designers who planned and created Fairchild's C-82 and its larger, more powerful sister ship, the C-119... transports that bring the Trooper to his goal.

Together, they make a winning combination... resulting in successful touchdown after touchdown... in the Air Age.

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# LONDON TO NEW YORK. NON-STOP WITH AN INCREASED PAYLOAD!

*In Today's Transport Aircraft*

Yes, this flight against normal headwinds can now be made by today's transport aircraft equipped with the new G-E CH9 turbosupercharger. It is possible because the CH9 injects extra miles and extra power into today's piston engines—extras which spell longer ranges and heavier payloads.

The CH9 was developed by General Electric as a component part for the Pratt & Whitney Aircraft R-4360-C engine. This new powerplant has been subjected to grueling tests under difficult conditions.

In addition to increased power for cruising, this development makes possible more takeoff power and lower fuel consumption.

Shorter takeoffs, more speed and much heavier payloads are the resulting advantages of this new powerplant.

Vastly simpler than any other compound engine now on the market, the new powerplant eliminates troublesome geared superchargers, clutches, gearings and fluid disks that waste energy and add expense. There are no mechanical connections between the engine and the turbo.

In the present configuration, the CH9 is fitted to the R-4360-C. It can be adapted to any piston engine of similar size. For further information, call your nearest G-E sales representative or write Apparatus Dept., General Electric Co., Schenectady 5, New York.



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