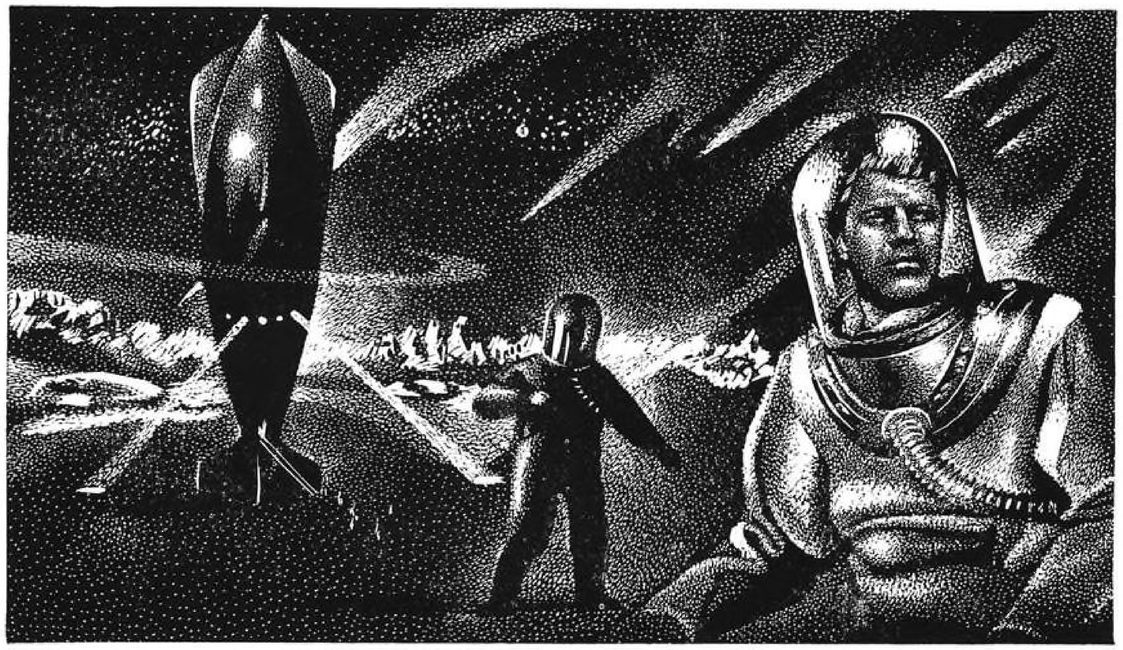
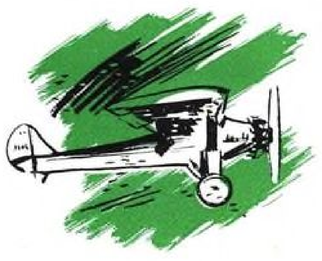
AVIATION WEEK

A McGRAW-HILL PUBLICATION

AUGUST 8, 1949



Racing Man's Imagination to the Moon



No, the scene above isn't from a comic strip. More likely, it might be the illustration from a Pesco ad of 19XX . . . you insert your own guess as to the exact date.

Fantastic? No! The only thing that approaches the fantastic aviation-wise is the tremendous progress the industry is making. In a few short years, speeds surpassing sound and almost unbelievable heights have been reached.

Aviation's engineers and scientists have been hard put to keep pace with man's space-conquest imagination. But they are doing it. And since Pesco manufactured its first hydraulic pump 16 years ago, our engineers have worked side by side with aircraft engineers helping to create many of the vital accessories for jet and reciprocating engines and aircraft that are making faster speeds and greater heights attainable.

Reach the moon . . . reach other planets? It may not be long now!

Pesco PRODUCTS DIVISION
BORG-WARNER CORPORATION
11610 Euclid Ave. · Cleveland 6, Ohio

The fighter whose shoes wouldn't fit

THIS all-weather fighter, North American's F-82, had to have heated propeller shoes for ice protection. But because of a hump at the base of the propeller blade, no shoe made would fit!

B. F. Goodrich engineers tackled the problem. They started with electrically-heated rubber—a thin, tough rubber pad with a core of resistance wires—and developed a special shoe.

Instead of running the resistance wires *lengthwise* throughout the shoe, they ran them *across* at the root to permit stretching. With its built-in stretch, the new shoe fitted smoothly and tightly over the propeller's leading edge, hump and all.

B. F. Goodrich electric rubber can be designed to do any anti-icing job that has ever come up. It can be made to fit any size, any shape airplane part and is easily bonded. It can be adapted to any adequate power supply. It simplifies design, saves weight and is the most efficient method of supplying spot heat.

Here are a few of the tested and proved applications: engine cowls, spinner domes, antenna and pitot masts, control surfaces, jet diffuser cowls, air scoops, hydraulic lines, water tanks. There are many others.

If you have an icing problem, why not get the expert help of B. F. Goodrich engineers? Write to *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

B.F.Goodrich
FIRST IN RUBBER

Vol. 51, No. 6

AVIATION WEEK

August 8, 1949

McGRAW-HILL PUBLISHING CO., Inc., James H. McGraw (1860-1948), Founder. Publishing Office, 99-129 N. Broadway, Albany, N. Y. Editorial and Executive offices: 330 W. 42nd St., New York 18; 520 N. Michigan Ave., Chicago 11; 68 Post St., San Francisco 4; Aldwych House, London, W.C. 2; National Press Bldg., Washington 4, D. C.; Architects Bldg., 17th & Sansome Sts., Philadelphia 3; Hanna Bldg., Cleveland 15; 2980 Penobscot Bldg., Detroit 26; Continental Bldg., St. Louis 8; 1427 Statler Bldg., Boston 16; Rhodes-Haverty Bldg., Atlanta 3; 621 South Hope St., Los Angeles 14; 738-39 Oliver Bldg., Pittsburgh 22. JAMES H. McGRAW, Jr., President; CURTIS W. McGRAW, Vice-President and Treasurer; EUGENE DUFFIELD, Senior Vice-President, Publications Division; NELSON BOND, Vice-President and Director of Advertising; JOSEPH A. GERARDI, Secretary; J. F. BLACKBURN, Jr., Vice-President and Director of Circulation . . . Aviation Week, 330 W. 42nd St., New York 18. Published weekly, price 50¢ a copy, 50¢ in Canada. Allow at least ten days for change of address. Address all communications about subscriptions to Director of Circulation, 330 W. 42nd St., New York 18, N. Y. Subscription rates—United States and possessions, $6 a year, $9 for 2 yr., $12 for 3 yr. Canada, $7 for 1 yr., $11 for 2 yr., $14 for 3 yr., payable in Canadian currency at par. Pan American countries, $10 for 1 yr., $16 for 2 yr., $20 for 3 yr. All other countries, $20 for 1 yr., $30 for 2 yr., $40 for 3 yr. Please indicate position and company connection on all subscription orders. Entered as second class matter July 16, 1947, at Post Office, Albany, N. Y., under Act of March 3, 1879. Volume 51, Number 6. Printed in U.S.A. Cable address "McGraw-Hill New York." Member A.B.C.

NEWS SIDELIGHTS

Runway Strength Survey

CAA plans a detailed survey on airport runway strength, as a result of differences of opinion between runway engineers about pavement requirements for various loads. Current CAA runway strength standards have been under fire and characterized by some engineers as "over-strength beyond reasonable requirements for economy and safety."

Phillips Moore, CAA Airports Director, points out that standards are for pavements designed to take capacity operations of planes of the weight specified without excessive maintenance. He says that most criticisms he has received have cited cases of occasional uses of relatively light pavement by large aircraft without any apparent damage, or cases where investigation shows that a special soil condition exists.

Moore sees a responsibility for large-plane designers in incorporating dual landing gear and dual tandem assemblies, instead of single wheel gears, to reduce the thickness requirements by spreading the load. (Another solution is the caterpillar track landing gear.) While pavements can be designed for any weight airplane, there is a practical limit to the strength of runway which the airport owner can afford to provide.

Subsidy Problem

Senate Interstate & Foreign Commerce Committee may make its own survey and lay down in law service mail pay rates for airline routes.

The committee is now stymied on the issue of separating service and subsidy payments to carriers. Sen. Edwin Johnson (D., Colo.), chairman of the committee, favors legislation granting the Civil Aeronautics Board $300,000 to make the study, and directing that the new system be put into effect July 1, 1950. CAB, however, has vigorously protested the stipulation for an effective date. The Board wants only the $300,000 to make the study.

Members of the House Appropriations Committee, on the other hand, are opposed to giving the Board additional funds, claiming that CAB ought to be able to set services rates for route segments with information it now has on hand.

Radio Operator Fight

CIO Transport Workers Union continues its fight against elimination of radio officers from crews on international flights.

Airlines Fight Back

The air transport industry is gathering ammunition to fire back at railroads that have been using advertisements, news releases and appearances before congressional committees to turn public sentiment against the airlines.

R. B. White, president of the Baltimore & Ohio Railroad, asserted recently that the railroads carry 94 percent of the mail and receive less pay for it than the airlines do for carrying the remaining 6 percent. J. H. Parmelee, vice president of the Assn. of American Railroads, attacked the airlines' "uneconomic form of competition" in testimony before the Senate Interstate and Foreign Commerce Committee.

The airlines challenge statements that the railroads are unsubsidized and assert that government aid to air carriers has been greatly exaggerated by the rails. Moreover, the airlines have compiled statistics showing that railroad freight shippers are heavily subsidizing rail passenger operations which, with few exceptions, are conducted at a loss.

Latest maneuver is the sending of letters by CIO Secretary-Treasurer James B. Carey to CAB Chairman Joseph J. O'Connell, Jr., as chairman of the Air Coordinating Committee, and Secretary of Commerce Charles Sawyer, calling attention to the Inter-American Telecommunications Treaty of 1938.

According to the letters, Article 16 of the treaty makes it compulsory for all commercial aircraft to carry radio apparatus and a licensed operator on flights between American countries.

Carey charged that the Civil Aeronautics Administration was jeopardizing human lives by permitting airlines to drop radio officers. He asked Sawyer to take "direct action" to correct the situation.

Wary Mexicans

After repeated unsuccessful attempts to negotiate a bilateral air transport agreement with Mexico by the direct method, the U. S. recently tried the indirect approach—and failed again.

Mexico has been dickering for a $400 million loan to develop its oil industry. U. S. officials indicated $400 million was too high, but that this country might go along with a $100 million loan under certain conditions, one of which included the signing of a commercial air agreement.

The Mexicans decided there were too many strings attached to the oil loan deal and refused the U. S. proposition. Eastern Air Lines, Braniff Airways and Western Air Lines have been certificated for routes to Mexico but have been unable to activate them because of breakdowns in pact negotiations.

Closer Separation

Defense Secretary Louis Johnson sent a concurrent memo to secretaries of the USAF, Army and Navy, pointing out that "establishment of the armed services as separate departments should not impede the integration of the three departments."

The memo came at the same time as Johnson's recent signing of the last of a series of 40 transfer orders establishing the Air Force as a separate department of the National Military Establishment (AVIATION WEEK, Aug. 1). The orders and joint Army-Air Force adjustment regulations issued as a result of the orders, for the first time now gives the Air Force a legal basis for its operations comparable to that of the two older departments.

Which Stalling Speed?

Part 3 of Civil Air Regulations sets an approved stalling speed for non-transport aircraft at 70 mph. Recent CAB decision approving use of single-engine aircraft for contact flight scheduled operation, refers operational procedure for single-engine operations to the CAA for regulation.

So CAA comes forth with a manual of procedure for air carrier operating certificates for local areas, which limits the stalling speed to the lower figure of 56 mph. Then in effect it makes exceptions in case of non-dangerous terrain, the only kind of terrain the single-engine planes are supposed to fly over anyway. It also makes exceptions in favor of older planes under other hypothetical conditions.

Result is a considerable confusion among the groups seeking to operate, and a need for clarification of the CAA manual. One industry source reported last week that a preliminary study showed only one of the four-, five-place single engine postwar planes, the Beech Bonanza, would meet the 56-mph. stall requirement.

AVIATION CALENDAR

Aug. 6-14—1949 West Coast soaring championship, Palmdale Airport, Calif.

Aug. 7-14—Second annual southwestern soaring contest, NTAC airport, Grand Prairie, Tex.

Aug. 22-23—ARTC, western division meeting, Boeing plant, Seattle, Wash.

Aug. 23-26—American Institute of Electrical Engineers, Pacific general meeting, Fairmount Hotel, San Francisco.

Aug. 25-28—Flying Farmers national convention, Fort Collins, Colo.

Aug. 29-Sept. 1—Aeromedical Assn., annual meeting, Statler Hotel, N. Y.

Sept. 1-7—International conference of Federation Aeronautique Internationale, Wade-Park Manor, Cleveland, Ohio.

Sept. 3-5—1949 National Air Races, Cleveland, Ohio.

Sept. 6-8—Annual spark plug and ignition conference, sponsored by Champion Spark Plug Co., Hotel Secor, Toledo, Ohio.

Sept. 7-11—10th Society of British Aircraft Constructors flying display and exhibition, Farmborough Airfield, Hampshire, England.

Sept. 9-12—Clinic on maintenance of industrial instruments, Instrument Society of America, Statler Hotel, St. Louis.

Sept. 18-20—International Northwest Aviation Council convention, Spokane, Wash.

Oct. 3-8—Twentieth anniversary meeting, Ninety-Nines, Waldorf-Astoria, New York.

Oct. 5-8—SAE national aeronautic meeting and aircraft engineering display, Biltmore Hotel, Los Angeles.

Oct. 7-8—American Air Mail Society exhibition and convention, Edgewater Beach Hotel, Chicago.

Oct. 12-15—Air Reserve Assn. convention, Long Beach, Calif.

Oct. 30—Third annual San Francisco Air Fair, sponsored by Junior Chamber of Commerce, San Francisco Airport.

Oct. 30-Nov. 2—Annual convention, National Assn. of State Aviation Officials, New Orleans.

Nov. 9-11—Seventh annual meeting Aviation Distributors and Manufacturers Assn., French Lick Springs Hotel, French Lick, Ind.

Jan. 13-15, 1950—All-American Air Maneuvers, Miami.

PICTURE CREDITS

12, 13—De Havilland; 16—INP; 24—NME; 37—NWA; 38 (bottom), 39—IATA.

NEWS DIGEST

DOMESTIC

Douglas Super DC-3 flew from Los Angeles to San Francisco in 1 hr. 37 min., clipping 10 minutes off the scheduled flight time of the fastest twin-engine transport in service.

Aeronca Aircraft Corp. board of directors re-elected John A. Lawler, president; Edmund H. Wideman, vice president, and S. J. Kuderer, secretary-treasurer. Maynard E. Simond was re-elected chairman of the board.

Raymond L. Ward, 52, assistant treasurer and comptroller of Curtiss-Wright Corp., died of a heart attack in the company's offices in Wood-Ridge, N. J.

TEMCO received an initial order from the Ecuadorian Air Force for approximately $10-million worth of C-47, PT-19 and AT-7 spare parts. Order raises TEMCO's 1949 volume in military and transport aircraft spares well over the quarter million dollar mark.

National Airlines has proposed a "family plan" for international air travel, to become effective next month. National would extend a 50 percent reduction for family members accompanying one full-fare adult, from midnight Sunday to midnight Wednesday, on its routes between Havana and Miami, Tampa, Washington and New York.

Civil Aeronautics Board last week was holding a public hearing to determine the probable cause of the Seattle crash of an Air Transport Associates, Inc., C-46.

National Mediation Board met last week with Air Line Pilots Assn. and National Pilots Assn. representatives to determine who can vote if election is held to select a collective bargaining agent for NAL cockpit personnel. NPA, formed by non-union pilots last year during National's strike, challenges ALPA's status as bargaining agent. ALPA has charged National kept NPA members on its payroll unnecessarily after ALPA pilots returned to work.

Luscombe Airplane Corp. reorganization may hinge on a $600,000 Reconstruction Finance Corp. loan applied for last week. Plane manufacture at Luscombe has temporarily halted. About 65 employes are working on military contracts and subcontracts from Boeing and Consolidated Vultee. Heavy postwar plant investment in expectation of larger immediate production left the company short of operating capital. Findings show assets of $915,273.03 and liabilities of $692,363.48.

First Joint Fellowships, awarded by the aviation industry, Cornell Aeronautical Laboratory, Inc., and Cornell University, included grants from Curtiss-Wright Corp., Fairchild Engine and Airplane Corp., Grumman Aircraft Engineering Corp., and Republic Aviation Corp. Fellowships are good for study at the university and laboratory.

Howard Rinehart, 64, onetime chief test pilot for Orville Wright, was found dead in Hattiesburg, Miss.

FINANCIAL

Republic Aviation Corp. reported net income after taxes of $317,883 for first six months of 1949. Sales for the period totalled $17,779,302 and backlog now stands at $56,500,000. Republic is currently conducting a test flight program with the XF-91 jet interceptor.

Standard-Thomson Corp. showed a net profit of $510,309, after charges and taxes, for fiscal year ended May 31, 1949. Profit is equal to $1.02 per share, compared with a net profit of $338,453, or 68 cents a share, in the preceding fiscal year. Consolidated sales for the year through May, 1949, were $7,690,289, compared to $7,073,696 for the previous fiscal year.

Robert Gair Co., Inc. showed a consolidated net income for the quarter ended June 30, 1949, of $803,399 after taxes, equal to 40 cents per share on 1,779,888 shares of common stock. Consolidated income for the first six months of 1949, after taxes, was $1,859,985, equal to 94 cents per share of common stock.

INTERNATIONAL

Britain unveiled a ten-engined, 140-ton flying boat of the Princess class, which the manufacturer—Saunders-Roe, Ltd.—says will fly in 18 months. Craft was ordered by British Overseas Airways Corp.

SAS carried 1866 passengers from New York to Europe in June, for a 99.6 percent load factor and a new record for the carrier. For the first six months of 1949, SAS carried 8009 passengers to and from the United States.

Guatemala passenger service was resumed after a four-day interruption when commercial flights to and through the country were suspended by a revolutionary outbreak. TACA and Pan American Airways were affected.

WHO'S WHERE

Aeronca Aircraft Corp. has named **Walton B. St. John** general sales manager of its aircraft section. Selection promises an interesting competitive situation. St. John was with Piper Aircraft Corp. as sales manager through the postwar boom, and **J. W. "Jake" Miller,** once his second-in-command, has succeeded him there.

Ryan Aeronautical Co. has promoted **Colin A. Stillwagen,** controller since 1946, to new position of director of materiel and contract administration. **Walter O. Locke,** assistant to the president, becomes also special assistant to the executive vice president. **L. L. "Jeff" Underwood** was elected assistant treasurer and will direct the controller's office.

Stanley Aviation Corp. has added **Richard H. Frost** to its staff as senior project engineer. Frost, formerly an engineer for Pan American, also has been test pilot and project engineer for Bell Aircraft Corp., and chief engineer of the Arens Controls Co.

Republic Aviation Corp. has named **Tom A. Murphy** assistant general manager in charge of manufacturing, inspection and industrial relations. Murphy is a former general manager of Sikorsky Aircraft division of United Aircraft Corp.

New assistant to the general manager of Standard-Thomson Corp., automotive and aviation parts manufacturer at Dayton, is **James P. Malmstrom,** who recently established the company's electronics and aircraft equipment division.

Lockheed Aircraft Service has appointed **Kenneth V. Sampson** manager of MacArthur Airport Base. He was assistant manager.

Three additions to Fairchild Aircraft Division's engineering staff are **Ilia I. Islamoff,** formerly of TWA's international division; **Robert A. Darby,** formerly of Curtiss-Wright Corp., and **Ernest J. Greenwood,** formerly of Chance Vought.

Karl F. Kellerman leaves his post as executive director of the Committee on Guided Missiles of the Research and Development Board, which he helped set up, to head a new Washington branch of the Brush Development Co. of Cleveland, electronic and electro-mechanical products designer and manufacturer.

OTHER CHANGES

The position held by **Ken MacDonald,** manager of San Francisco chamber of commerce aviation dept. and author of its weekly newsletter, has been discontinued . . . **Robert C. Blatt,** former editor of Airports and Air Carriers, is associate editor of Electrical World, a McGraw-Hill publication . . . **Marshall F. Bannell,** director of public relations of Waterman Steamship Corp. and affiliated companies, including TACA, has resigned without announcing future plans . . **John J. "Jack" Woods,** widely known in the air transport industry, will become deputy commissioner of transportation in New York City, a $15,000-a-year post . . . **A. L. "Al" Emery,** formerly of American Airlines, has become Colonial Airlines' regional sales manager in New York State with headquarters at Albany. His territory includes all of the state except New York City.

INDUSTRY OBSERVER

► **Chance Vought Aircraft will establish a flight test base for the F7U Cutlass and the F6U-1 Pirate jet fighters at Ardmore, Okla., Air Base, recently vacated as a training center by American Airlines. Approximately 80 persons will conduct the operation, established because of the 7200-ft. runways at Ardmore. Workers and planes may be ferried to Ardmore daily for tests from Chance Vought plant at Grand Prairie, Tex.**

► Armstrong-Siddeley has taken over testing and production phase of the newest British turbojet engine, the Sapphire, from Metropolitan-Vickers, which had charge of the initial development phase.

► **The Mark IV de Havilland Goblin turbojet is rated at 3600 lb. static thrust as compared to 3300 lb. for the Mark III Goblin.**

► Rolls-Royce Clyde Mark III, which uses both centrifugal and axial flow compressors, produces 4000 shaft horsepower. The two compressors are not geared together.

► **Bristol Proteus develops 3200 hp., using two compressor driving turbines and one propeller driving turbine. Proteus uses a variation of the somewhat outmoded reverse-flow system: Air enters an aft intake, passes forward through the 12-stage axial compressor, then turns and moves aft through the combustion chambers and out through the turbines.**

► Curtiss-Wright production of a new and heavier propeller hub (C632S-B) is expected to make possible complete equipment of all American Airlines DC-6s and Convair 240s with this new installation Oct. 1. New hub is replacement for one designated C-632A-S now in service. Replacement program followed reports of cracks in the blade retaining area, found in some of the lighter units.

► **Hamilton Standard is checking for cause of similar propeller blade cracks discovered in routine inspections on Pan American Boeing Stratocruisers recently. Pan American followed the discovery by ordering a fleet-wide check. In two cases the cracks were reported on No. 4 blade, running longitudinally from shank to tip. One crack was 2½ in. and the other 4½ in. long.**

► Piper Aircraft engineers say new propeller installations on the four-place Piper Clipper kick the cruising speed of the 115-hp. plane up to 120 mph. Plane has recently been approved for installation of the new Sensenich all-metal fixed pitch propeller, the Aeromatic automatically variable pitch prop and the Sensenich two-position Skyblade.

► **Although Sikorsky's new hydraulic power control for helicopters adds about 25 lb. weight to the S-51 demonstrator helicopter, engineering changes now make it possible for the control to be designed without weight penalty by substituting a lighter push-pull control system for the heavier jack screws and chains in the existing control system.**

► French SE 2410 originally planned as an attack bomber is now being used entirely for research on a large jet bomber project. The SE 2410 features a pair of Hispano-built Nene turbojets in a staggered (fore and aft) mounting with one on top of the other and a boundary layer bleed air intake on top of the fuselage. A humped nose accommodates the cockpit and according to wind tunnel tests does not impede flow of air into the fuselage intake. Wing has leading edge flaps as well as double trailing edge flaps. Tail surfaces are sweptback with an extremely low mounting of the horizontal stabilizer and elevators.

►**Slick Airways is studying a project for developing feeder freight routes into its main lines using smaller single-engine freighters, preferably of Noorduyn Norseman or similar type.**

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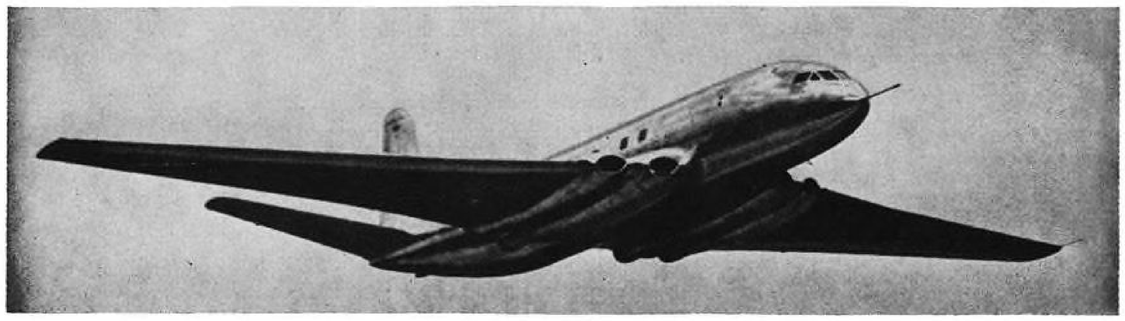


British Jet Transport Makes First Flight

Comet gives Britain wide edge over rest of the world in jet transport design.

By Robert McLarren

When the world's first designed-for-the-purpose jet transport, the 36-passenger British de Havilland DH-106 Comet successfully completed its first test flight July 27, it opened a new era in commercial air transportation, and put the United States and the rest of the world at least three years behind technologically in this field.

Chief test pilot John Cunningham, at the controls of the prototype Comet during its 31-minute flight heading a crew of four, took the four-jet plane up to 10,000 ft. and performed shallow maneuvers to test its stability and control. Then he made a confident low-altitude "buzz" flight about 100 ft. off the Hatfield, Hertfordshire, airport before coming in for an easy landing.

▶ **Three Years More**—It will be about three years (late 1952 or early 1953) before production Comets will be ready for introduction on the British Overseas Airways Corp. trunk services. But it is not expected the Comet will be introduced on a London-New York nonstop service initially, despite prestige value of such a schedule. Development of the turbojets to make possible a slightly longer range than the 2000 miles now quoted must come first.

The prototype took the air less than three years from the decision to "go ahead" on the project taken by de Havilland on its own initiative in September, 1946. A remarkable example of the confidence of the test pilot and crew is the fact that the plane flew only 48 hours after having been rolled from the factory, in contrast to the weeks of ground testing common for such a large and complex project.

▶ **Ghost Turbojets**—Outstanding attributes of the Comet are its clean lines and facile installation of the four de Havilland Ghost turbojet engines, which develop 5000 lb. static thrust each. The new transport has a cleaner appearance than current U. S. jet bombers and obviously great attention has been paid exterior finish and workmanship to insure maximum flight efficiency. Generous use has been made of the British Redux method of metal-to-metal bonding, which not only permitted a smooth surface finish but simplified air-tight design of the cabin.

The low monoplane wing has only moderate sweep of about 30 degrees, most of which is along the leading edge, indicating greater interest in stability than in increase in critical Mach number. Tail surfaces are not swept-back.

▶ **Slow Landing Speed**—Careful attention was paid to landing characteristics of the Comet. Generous wing area reduced the loading to below that of recent piston-engine U. S. type; half-semi-span leading edge automatic Handley-Page slots are used; three trailing edge flap panels extend under the fuselage and outboard to each aileron, and four sets of air brakes above and below the trailing edge all combine to give the Comet a landing speed of well under 100 mph. Despite these panels, however, great care has been exercised in their fitting tightly in the closed position to insure low drag for high cruising speed.

Fully retractable tricycle landing gear is used, the nose gear folding aft into the lower fuselage and the main gear units folding outboard into the outer wing panel, where they are covered by large doors. The nose gear is fitted with dual wheels but large, single wheels are used on the cantilever main gear legs. These wheels necessitated a formed blister on the wing upper surface to accommodate their tire width. de Havilland plans eventual installation of four-wheel main gear units, however, to permit operation of the Comet from medium-size airports and to eliminate the wing blister. A retractable tail skid mounted in the aft fuselage affords protection in nose-high landings.

▶ **Clean Installation**—Power plant installation is an exceptionally clean job in view of the fact that the wing profile is thin and the Ghost has a centrifugal compressor and a consequent overall diameter of 53 in. The engines are located well aft between the spars. Air intakes proceed through cutout in the web. The engines are canted downward slightly, necessitating a lower fairing forward and an upper fairing aft. The wing-fuselage juncture is generously faired due to the dihedral and, although this adds area drag, serves to stabilize the airflow over this region. Under-wing fuelling inlets are provided. The Comet will carry most of its fuel in integral wing tanks.

Empennage is simple cruciform layout with dihedraled stabilizer to clear the jet exhaust wake. The small area of the vertical surfaces is causing considerable controversy among engineers.

De Havilland engineers point out that the high speed of the airplane plus the close-in location of the powerplants minimizes the asymmetric loads that must be accommodated. However, U. S. engineers confidently predict added fin area in the not too distant future if adequate control during landing and takeoff is to be assured.

▶ **Pressure Problems**—The 40,000-ft. cruising altitude of the Comet accentuated cabin pressurization problems. A pressure differential of 8¼ psi. had to be designed for, a figure substantially greater than any used by current U. S. transports. The entire fuselage is pressurized, including freight and mail compartments, for simplicity's sake. Two test sections of the fuselage were given pressure tests in the altitude chamber at Hatfield and also subjected to underwater tests. Because of dryness of air at operating altitude, air conditioning equipment is provided.

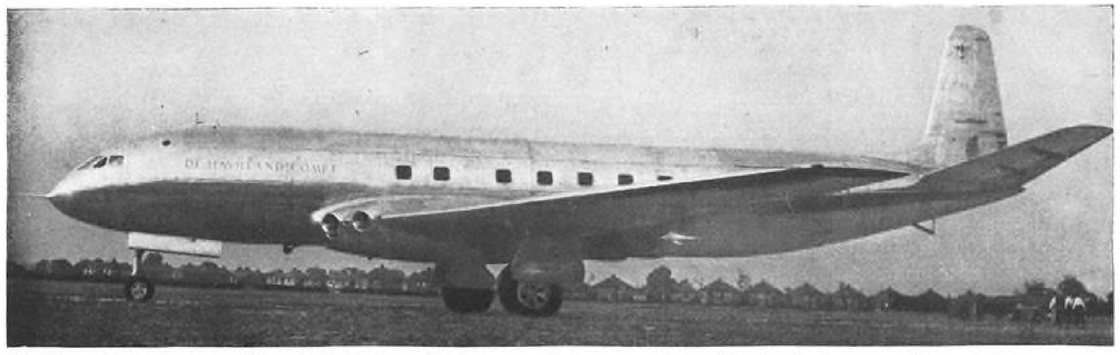
Although first flight test was accomplished considerably ahead of schedule neither de Havilland nor the government expect the new transport to go into actual service for about three years. In addition to the usual time-taking shakedown of the airplane, considerable effort is planned on development of the power plant units with major emphasis on reduction in specific fuel consumption in order that the endurance of the airplane can be improved to meet traffic control requirements.

DH-106 Comet

Engines	4 D. H. Ghost—5000 lb. thrust
Approx. Span	106 ft.
Approx. Length	85 ft.
Cruising Speed	500 mph.
Cruising Altitude	40,000 ft.
Crew	4
Passengers	36
Cruise Range	2000 mi.
London-New York	6 hr.
On order	2, Ministry of Supply; 14, BOAC

DE HAVILLAND GHOST TURBINES, giving 5000 lb. thrust, being installed . . .

. . . THEN TEST RUN on the Comet. Engines are same type as power the Vampire.



POISED ON THE RUNWAY at Hatfield, England, the jet-propelled transport is shown before its first successful test flight.

Prototype Transport Bill Revived

Congress seeks means to help U. S. builders develop liners in order to capture lead held by new British craft.

Great Britain's advance in high-speed jet transports has spurred congressional interest in legislation authorizing a government-financed air transport prototype program to assure the United States commercial aviation leadership.

There were these developments last week:

• **Sen. Owen Brewster** (R., Me.) introduced a new prototype bill revising the Brewster-Hinshaw measure which barely missed enactment last year. Changes in the new bill were recommended by the informally-organized Inter-Departmental Prototype Committee, under the direction of Civil Aeronautics Administrator Delos Rentzel, which has been making a study of this subject for the past year.

• **Sen. Edwin Johnson** (D., Colo.), chairman of the Senate Interstate and Foreign Commerce Committee, said that his group may take up prototype legislation within the next few weeks. Johnson's original plan was to postpone action until a report outlining the national defense requirements of commercial aviation is completed, probably by September. Defense Undersecretary Steve Early is directing this study of requirements.

• **Aircraft Industries Assn.** polled its members on the new Brewster bill. Manufacturers antagonized Air Transport Assn. last year by opposing prototype legislation. Possibility that U. S. airlines will look to British firms for new type planes within the next five years, Brewster believes, will prod manufacturers into a change of position. Lockheed Aircraft Corp. and Douglas Aircraft Co. have recently indicated to Brewster that they now favor a prototype program.

Indications are, however, that the majority of manufacturers will urge that the Air Force undertake cargo and transport development. A sizeable segment of Congress sides with this position on the grounds that when the government is paying for plane developments the primary consideration should be military use.

Airlines, on the other hand, support a civilian-controlled program, as proposed in both the new Brewster bill and last year's Brewster-Hinshaw bill, under which commercial adaptability would be the first consideration in new prototypes. The program would be directed by a five-man board of two military and three civilian agency members representing the Air Force, Navy, National Advisory Committee for Aeronautics, Civil Aeronautics Administration, and the Civil Aeronautics Board.

▶ **Changes**—Following are changes from the Brewster-Hinshaw bill embodied in the new Brewster bill:

The board is designated "Aircraft Development Board" instead of "Civil Air Transport Evaluation and Development Board."

It is organized in the Air Force, but remains independent.

A seven-member "Aircraft Development Advisory Committee" representing the public, manufacturing industry, scheduled airlines, irregular carriers, and aviation labor (three representatives), is established to assist the board. The old bill set up a six-member industry advisory committee and did not designate representation.

A stipulation is added that the board undertake only transport developments "which the aircraft industry would not otherwise develop" and "foster the optimum freedom of design and construction for maximum efficiency." This is aimed at meeting manufacturers' objection that under the old bill private initiative would be wiped out, with the industry building planes blue-printed in Washington.

Another provision is added that "to the extent feasible, the cost of . . . research, experimentation and development shall be shared" by the manufacturer.

The Secretary for Air, upon the recommendation of the board, is authorized to recover developmental outlays—probably by an assessment on each sale when a plane is in production. Under the old Brewster-Hinshaw measure, the secretary was merely directed to recommend to Congress ways and means of recovering government investments for development.

The Secretary for Air is given tight control over patents resulting from government-financed developments. The old bill made no mention of the subject.

It is "declared to be the policy of Congress that the Reconstruction Finance Corp. shall participate in the financing" of leases and sales of aircraft developed under the program. The old bill contained no provision for financing sales.

Airlift Decreases

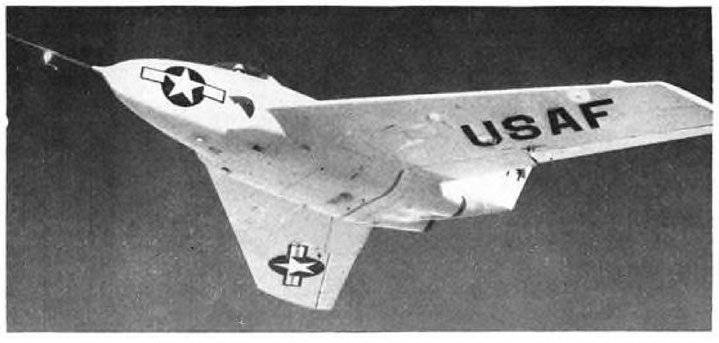
The Berlin Airlift started on the road to gradual demobilization last week by slicing more than in half its daily hauls to the German capitol.

"Operation Vittles" came up to the retirement mark in full stride with 920 British-American flights flying in 8497.6 tons of cargo July 31.

The new schedule, started Aug. 1, requires only 3700 tons per day to be airfreighted to Berlin, still almost double the tonnage which was shipped this time last year.

Shipments will be reduced further to 2100 tons daily in September, and finally to 1000 tons per day in October. This reportedly will be the last month of the airlift which started almost 14 months ago.

Air Force expects to send the first group of airlift personnel home in September.



NORTHROP RESEARCH PLANE FLIES

First flight photo of the Northrop X-4, subsonic research airplane, reveals flat underside and stubby fore-and-aft appearance. Although flying since June 7, 1949, this is first flight photo released. Craft is designed to test swept-wing tailless configuration at near-sonic speed and to determine handling characteristics of such types in the complex transonic zone. No. 2 airplane has now joined the prototype at Muroc for flight tests. Northrop test pilot Charles Tucker, former Thompson Race pilot, has handled all X-4 flying to date. Two 1600-lb.-thrust Westinghouse 19B turbojet units carry tiny craft to 650 mph. speed at 10,000 ft., its maximum design speed.

Freight Case

CAB reaffirms opinion; grants certificates to four carriers.

Sticking to its tentative opinion of three months ago, the Civil Aeronautics Board last week issued a final decision granting five-year certificates to four airfreight lines.

Transcontinental all-cargo routes went to Slick Airways, San Antonio, and the Flying Tiger Line, Burbank, Calif. U. S. Airlines, St. Petersburg, Fla., was granted a north-south system east of the Mississippi; and Airnews, Inc., San Antonio, received authority to operate between San Antonio and the Rio Grande valley.

▶ **Board Split**—As in the preliminary decision (AVIATION WEEK, May 9), CAB chairman Joseph J. O'Connell, Jr., vice chairman Oswald Ryan and member Russell Adams favored certification of the all-cargo carriers. Members Josh Lee and Harold Jones again issued strong dissents.

Major change in the final opinion was the proviso preventing the airfreighters from carrying property shipped by Railway Express Agency. In the short run, at least, this restriction may seriously affect the revenues of the all-cargo lines, who had counted on handling a sizable portion of REA's profitable air express traffic.

▶ **Willis Loses**—CAB again decided that certification of two carriers for north-south service east of the Mississippi would so dilute traffic as to make operations uneconomical for both. The Board reiterated that U. S. Airlines is better equipped financially to weather the initial economic difficulties of establishing the new service than Willis Air Service, Teterboro, N. J., which waged a last-ditch fight for the routes.

The three-man CAB majority in its final opinion took special note of charges by the passenger-carrying lines, the Post Office Department and the Board minority that the all-cargo carriers would continue to lose money under their certificates and would ask for mail pay and RFC loans to bail them out.

▶ **Subsidy Issue**—"We have found," the majority emphasized, "that the public convenience and necessity do not require certification of the all-cargo lines for carriage of mail, and have specifically stated that one important factor in our decision is that mail pay support will not be given the freight carriers. Any speculation that at some other time we might arrive at another conclusion has no relevance to the issues of the present case."

The Board's majority again voiced disbelief that certification of a few all-cargo carriers will inflict destructive traffic diversion on presently-certificated airlines. Inferentially, the Board advised the passenger-carrying lines to concentrate on filling the unused cargo space on their combination planes rather than on extension of all-freight services.

Presently-certificated carriers have in their passenger traffic a type of carriage which by its character and size should provide ample opportunity for profit under honest and efficient management, CAB declared. "There seems little logic in believing that a monopoly of air-freight would make bulk of their business—passenger carrying—profitable."

▶ **Yardstick Role**—The all-cargo carriers, operating without mail pay, will provide a valuable yardstick for measuring the alertness and efficiency of passenger-carrying lines which also handle freight, the Board continued. "They will also provide a continuing spur of competition for presently-certificated lines."

CAB recognized that the all-cargo carriers are likely to continue operating in the red during the initial phases of their certificated service.

B-36 Probe Set To Open Aug. 9

Floyd Odlum, president of Atlas Corp., and Robert Lovett former Assistant Secretary of War for Air, will be lead-off witnesses in the House Armed Services Committee investigation of the B-36 bomber. It is now scheduled to open Aug. 9, Rep. Carl Vinson (D., Ga.), chairman, announced last week.

The investigation will also cover cancellation of the Navy's 65,000-ton supercarrier and other aerial warfare issues. It was voted following a House speech by Rep. James Van Zandt (R., Pa.), a Naval Reserve captain. He reported "ugly rumors" that political influence of Defense Secretary Louis Johnson, a former director of Consolidated Vultee Aircraft Corp., manufacturer of the B-36, figured in the Air Force's decision to concentrate procurement on the plane.

Atlas Corp. controls Consolidated. Lovett served as Assistant Secretary of War for Air during the early war years when the B-36 was first projected.

Raise in Sight for Aircraft Workers

Aircraft Industries Assn. concedes pay boost is justified and suggests 80-95¢/hr. minimum; unions want $1.15.

Increase in the minimum hourly wage to at least 95 cents an hour for work on government aircraft contracts of more than $10,000 appears likely within a few months as a result of the recent Washington wage hearings.

Such an increase may seriously upset labor relations in plants not primarily engaged in aircraft work, resulting in two wage scales for aircraft work and non-aircraft production, spokesmen for these manufacturers testified at the hearings.

▶ **Union Proposal**—Verl E. Roberts, chief of wage, hour and public contracts wage determination section, who presided at the hearings, expects to complete his findings in about a month. The hearings were called on the proposal of the CIO United Automobile Workers and the International Assn. of Machinists (Ind.) that the minimum wage of 50 cents on such government aircraft contracts, in existence since 1938, be raised to the new rate of $1.15 an hour.

Wage hour chief William R. McComb will forward Roberts' findings and his own recommendation to Secretary of Labor Maurice J. Tobin.

Tobin, under authority of the 1936 Walsh-Healey Public Contracts Act, then will fix what he finds to be the "prevailing minimum wage" for the industry. It will go into effect 30 days later.

▶ **AIA Brief**—A higher minimum was virtually assured when the aircraft industries conceded, in a brief submitted by the Aircraft Industries Assn. that a raise was justified, but asserted that it should be to between 80 and 95 cents, instead of the $1.15 sought by the unions.

That the new minimum will be at least 95 cents was suggested by Tobin in calling the hearing. He said at that time that a survey by the Bureau of Labor Statistics last November showed that less than one-half of one percent of the 165,000 aircraft employes working on government contracts earned less than 95 cents.

▶ **Iron And Steel**—In a number of recent cases, Tobin has granted the full increase proposed by the union. The latest was in the iron and steel industry, in which Tobin raised the minimums to $1.08½, $1.19 and $1.23, depending on the region of the country. The old minimums ranged from 45 to 62½ cents an hour.

The aircraft industry's brief was submitted by Admiral DeWitt C. Ramsey, AIA president. Legal, technical and statistical points were made by Henry G. Hotchkiss, AIA counsel; C. Wilson Cole of Fairchild Engine & Airplane

Corp., and George Lewis of Consolidated Vultee Aircraft Corp.

▶**Two "Proper" Methods**—AIA contended that there were only two "proper and reasonable" methods for determining the prevailing minimum wage in the industry, and both indicated the figures should be between 80 and 95 cents an hour.

One method is to examine the starting rates paid to unskilled employes in the industry, the industry's brief pointed out.

"Only the rates of the unskilled employes should be examined and not the rates of all employes in the entire wage structure since the Walsh-Healey Act is concerned solely with 'prevailing minimum wages rates,'" the brief continued. "The entrance rates paid to unskilled employes are the true minimum rates of the aircraft industry. A survey of these rates shows the prevailing minimum wage rate to be 95 cents or less an hour."

The other method, AIA asserted, is to examine the minimum rates of wage structures provided for in collective bargaining agreements in the industry. A survey of the minimum rates of these wage structures is reported to show the prevailing minimum to be between 80 and 95 cents an hour.

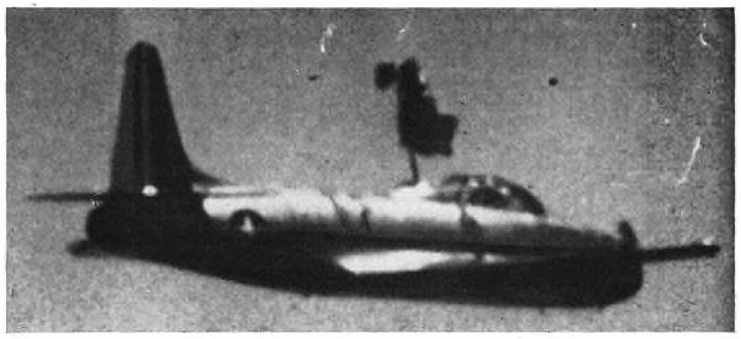
▶**Union Argument**—The unions argued that the average wage in the aircraft industry is $1.55 an hour and that only "a few straggler corporations" pay less than $1.15.

Government orders make up about 90 percent of the industry's work. Bureau of Labor Statistics figures show that between Jan. 1, 1947, and June 17, 1949, the industry did $1,293,350,679 worth of business with the government.

• **A breakdown of government purchases:**

Airplanes	$650,534,600
Engines	381,457,421
Propellers	36,303,292
Parts and accesories	195,674,419
Helicopter and related equipment	18,696,339
Specialized servicing tools and specialized testing equipment	10,684,608

▶**GE And Westinghouse Protest**—Protest against an increase in the prevailing minimum was submitted by 18 companies not primarily engaged in aircraft manufacturing. They asserted that it would upset labor relations in their plants if they have to raise wages on aircraft work when they have a lower rate for non-aircraft production.



BAIL-OUT AT 555 MPH.

Capt. Vincent Mazza, USAF Materiel Command, shoots out of the rear seat of a Lockheed TF-80C at 555 mph. in a demonstration of a new ejection seat blown clear by a 37-mm. cartridge. When free of the plane, the seat is stabilized by fins and a small drag chute. After the seat decelerated, Capt. Mazza was automatically disconnected, and his own chute opened. The TF-80C's canopy had rear portion removed for the test. No ill effects were said to have been caused by the ejection.

Defense Plan

USAF strategic bombing receives high priority as program crystallizes.

Collective Western Defense program as blue-printed by the Joint Chiefs of Staff calls for increased emphasis by the United States on long-range strategic bombing—utilizing its ace weapon, the atomic bomb.

Army Chief of Staff, Gen. Omar Bradley, outlined the program last week to the House Foreign Affairs Committee before taking off with Adm. Louis Denfield, Navy Chief of Staff, and Gen. Hoyt Vandenberg, Air Force Chief of Staff, for overseas discussions with European military leaders.

The committee is considering the President's $1,450,000,000 foreign armament program, involving:

• Aid to North Atlantic Pact countries (United Kingdom, France, Belgium, Netherlands, Luxembourg, Norway, Denmark, Italy, Portugal, Iceland, Canada), $1,100,000,000.

• Assistance to Greece, Turkey, Korea, Iran, and the Philippines, $350,000,000.

• Reimbursable loans to South American and other non-Communist nations for purchases of U. S. military equipment for the purpose of strengthening their defenses.

Specialized roles of the 12 nations under the program, as disclosed by Bradley, are:

"(1). **The U. S. will be charged** with the strategic bombing. We have repeatedly recognized in this country that the first priority of the joint defense is our ability to deliver the atomic bomb.

"(2). **U. S. Navy and the Western Union** (England, France, Belgium, the Netherlands and Luxembourg) naval powers, will conduct essential naval operations, including keeping the sea lanes clear. Western Union and other nations will maintain their own harbor and coastal defense.

"(3) **We recognize** that the hard core of the ground power in being will come from Europe . . .

"(4). **England, France,** and the closer countries will have the bulk of the short-range attack bombardment and air defense. We, of course, will maintain the tactical air force for our own ground and naval forces and U. S. defense . . ."

The program, Bradley said, is based on "assumed principles" which will be followed by the Defense Council provided for in the North Atlantic Pact. Organization of the council is one of the main points in the discussions between the joint chiefs and European military leaders now underway.

There is considerable speculation in Washington as to changes in the U. S. armed forces which may result from the collective defense program. Among prospects are:

• **The Air Force's concentration** on strategic bombing would be further increased. An increase in size appears doubtful, however, in light of the AEC report that one plane with one atomic bomb can accomplish the destruction of 20,000 tons of TNT which would require about 2000 bombers to deliver.

• **U. S. ground forces would be reduced,** and along with this, the tactical air support.

• **Universal military training** would definitely be "out."

Fairchild Starts Staff Reorganization

Fairchild Engine & Airplane Corp.'s aircraft division at Hagerstown went on vacation Aug. 1 and employes will see new faces and miss some old ones when they return next week.

The new management has been busy preparing to carry out one part of its promises to stockholders: Top management would be moved to Hagerstown from New York. To many of Fairchild's employes in New York this would probably mean new jobs—but with other firms.

President Richard Boutelle told AVIATION WEEK that, at the most, not more than three or four persons would be left in New York. But, Boutelle emphasized, many of the employes whose jobs would be terminated are not leaving because their work has been unsatisfactory.

He said that some employes do not care to move to Hagerstown from New York.

▶**Lineup**—This will be the "top management team"—another promise to stockholders—when Hagerstown comes back to work:

President Richard S. Boutelle replaces Lawrence B. Richardson. For the present Richardson is continuing with Fairchild as a consultant.

Vice president, comptroller and treasurer Arthur Flood replaces Webb Wilson, former treasurer, and William H. Schwebel, former secretary-comptroller. Wilson and Schwebel probably will not remain with Fairchild.

George F. Chapline, Ranger division vice president, remains at Farmingdale, N. Y., and Turner A. Sims, NEPA division vice president, remains at Oak Ridge, Tenn., where the respective divisions are located. Myron B. Gordon remains operations vice president. Paul S. Cleaveland becomes secretary.

Richard C. Palmer, formerly assistant to J. Carlton Ward, Jr., now becomes assistant to Boutelle. He stays in Washington.

In Fairchild's aircraft division, no one has been named to replace Boutelle as vice president and general manager. Acting assistant general manager is Willard Landers, replacing Kenneth Bowen, now on leave of absence.

Floyd Bennett, formerly manager of the accounting department, is now division comptroller. Simon T. Mulrooney becomes manager of the accounting department.

▶**Public Relations**—Fairchild's publication "Pegasus" will move to Hagerstown where all public relations will be headed by Warren Smith. F. D. Walker, Pegasus editor and Joseph E. Lowes, Jr., probably will not be included in any public relations plans.

The export division, under Robert Kinkead, will move from New York to Hagerstown, but how long it will continue to operate and whether Kinkead will remain hasn't been decided.

Auditors have been kept busy at the Rockefeller Plaza offices of Fairchild in preparation for the management switch. New York office personnel were being interviewed individually about their futures with the corporation. New management assured employes that severance pay would accompany all dismissals.

Colonial's Stand Strongly Supported

Heavy pressure has been thrown behind Colonial Airlines' demand for new routes to make its system economically sound and compensate for the estimated $1,000,000-a-year loss in passenger traffic the carrier will sustain as a result of the Canadian bilateral agreement.

Forty-nine senators—a majority of the Senate—protested, in a letter to the President, that the agreement has resulted in "serious damage to U. S. air carriers, one airline especially," and urged that "you take the necessary steps to assure that the agreement is not implemented until such time as a method has been devised to remedy damage to U. S. air carriers." The only strong opposition to the agreement has been Colonial's objection to the award of a Montreal-New York route to Trans-Canada Air Lines, paralleling Colonial's most lucrative operation (AVIATION WEEK, June 13 and June 27).

Sigmund Janas, president of Colonial, told AVIATION WEEK that his carrier would be "satisfied" if this Trans-Canada operation were postponed until Civil Aeronautics Board grants Colonial's new routes. It has filed for New York-Washington and New York-Buffalo-Syracuse-Toronto services.

The senators' letter objected that the Canadian agreement involved "the granting of very substantial rights to Canada in return for rights which are of little or no value to the U. S." and estimated that "an inevitable result . . . will be a considerably increased subsidy burden on the treasury of the U. S." It denounced the "secrecy" of the negotiations under which "U. S. carriers were deprived of valuable property and other rights without opportunity to be heard."

The agreement was termed "a flagrant example" of how the procedure followed in transacting executive air agreements can result "in unjust and unsound discrimination against U. S. companies, their employes and stockholders."

▶**Administration Supporters**—Senate Interstate and Foreign Commerce Committee has approved legislation requiring that all future air agreements take the form of treaties, subject to Senate ratification.

The number of sponsors of the protest to the President indicates that the measure will be overwhelmingly passed when it is brought up for Senate action.

Among the signers were the Administration's strongest supporters on Capitol Hill—Sen. James Murray (D., Mont.), Sen. Francis Myers (D., Pa.), Sen. Brien McMahon (D., Conn.), Sen. Warren Magnuson (D., Wash.), Sen. Robert Kerr (D., Okla.), Sen. Dennis Chavez (D., N. Mex.).

In addition to the Montreal-New York route, Canada obtained traffic rights at Honolulu on a Vancouver-Australasia route, and traffic rights at Tampa-St. Petersburg and a through route to the Bahamas and Caribbean points under the agreements. The U. S. obtained continued traffic rights at Gander on the North Atlantic route, a New York-Toronto route, and traffic rights at Edmonton on Northwest Airlines' North Pacific operation.

FINANCIAL

Airline Earnings Improve Credit

Securities yield of American, United and Northwest shows how traffic upsurge aids market standing.

Airline credit is currently undergoing a consistent improvement in investment standings. Record breaking gains in traffic and earnings have materially improved the airlines' financial outlook.

A reflection of this improving investment status is found in the steadily rising market quotations for senior airline securities.

▶**AA Debentures**—American Airlines 3 percent debentures, due June 1, 1966, have been selling into new high ground recently and have been accorded quality investment standing by a number of groups. With current quotations around 87, the indicated yield on these debentures is around 3.5 percent.

These debentures, in the amount of $40 million were marketed in June, 1946, by a syndicate headed by Lehman Bros. at a price of 102 to the public. The underwriters are known to have taken a large loss in this financing, as the price of the debentures declined almost immediately. A low of 70 was established for this issue during 1947. For 1948, these debentures fluctuated in price from a new low of 67 to a top of 78. At the start of this year, these debentures were quoted around 77 and have shown consistent improvement in reaching their present market levels.

▶**UAL Pulled Up** — Interestingly enough, the debentures of United Air Lines, are being improved marketwise as a result of the higher valuation being accorded the American bonds. United, early in 1947, placed an original debenture issue in the amount of $12 million with two insurance companies, $10 million to the Metropolitan Life and the balance with the Mutual Life. As these bonds have no public market, the National Association of Insurance Commissioners are known to have accorded the United debentures the same quotation as established by the AA issue.

Less fortunate is the Equitable Life Assurance Society of the United States which was recently directed by the same regulatory agency to carry its $38 million of TWA debentures, presently outstanding, at 50 cents on the dollar despite the outstanding recovery in earnings being made by that carrier. The Equitable also owns $20 million of the American debentures.

▶**Preferred Shares**—The improvement in airline credit standings, also has improved the positions of senior equities of the carriers as represented by their preferred shares.

Late last year and at the outset of 1949, there was a considerable question in the minds of many investors as to the continuation of dividend payments on most of these outstanding issues. It is also known that a number of conservative directors of the airlines involved were inclined to favor omitting dividend payments when current earnings simply did not exist to support such disbursements. In all cases, however, unbroken dividend payments were maintained.

Certainly, this unbroken dividend record can be construed as a favorable factor at this time in the higher market valuation being accorded these airline preferred shares.

American Airlines has 400,000 shares of a $100 par value 3½ percent convertible preferred issue outstanding. Issued to the public in June, 1946, the price of these shares declined almost immediately, giving the underwriters and the initial purchasers a very uneasy time. A low of 47 was established for this issue in the late 1948 tax trades.

As the improvement in the fortunes of American became more evident, a steady gain in market valuations took place this year with current prices around 64. At this level, the indicated yield is around 5.5 percent, the lowest for any of the major airline preferreds.

In other words, this is another sign of the market's opinion that there may be less uncertainty, relatively, as to the continuation of dividend payments.

▶**Recovery**—The United preferred has made a substantial recovery marketwise thus far this year. These shares, about 95,000 outstanding, were marketed around $105 per share in January, 1947. As doubt began to appear as to its credit standing, a steady deterioration in market prices developed with quotations establishing a low of $57.50 late in 1948.

Aided first by added mail pay and subsequently by an improvement in its own operations, the company's outlook assumed a more favorable atmosphere. As a result, the market price of the United preferred made a rapid recovery to present levels of around $72. At this price, the indicated yield is around 6.2 percent.

▶**NWA Comeback**—Northwest Airlines has the newest issue of preferred shares among the major lines. A total of 390,000 shares of 4.6 percent preference shares were marketed at $25 per share in April, 1947. Probably the greatest apprehension surrounding continued dividend payments was evidenced on these shares. This is evident by the decline to $13.625 per share recorded for this stock earlier this year.

Aided by two separate mail pay increases and a recent spectacular increase in operating revenues, better credit has been imparted to the company's securities. With the preference shares now quoted around $17.50 per share, a current yield of about 6.55 percent is indicated, the highest among the senior airline equities.

With record-breaking traffic and earnings reports being released for the summer months, there has been little doubt as to the continued dividend disbursements on all three issues during this period.

Should earnings go into reverse, however, for any of the carriers involved, it is obvious that doubts as to continued dividend disbursements will reappear.

On the other hand, a strong continuation of current traffic and earnings for the airlines involved can be carried forward to reflect a further improvement in airline preferred market prices.

▶**Attraction**—A latent attraction in all three preferreds is the conversion feature. Convertible into common stock, interesting speculative appeal is attached to these senior equities in periods of rising markets. Each share of American preferred is convertible into common at $21 per share or about 4.6 shares of common for each share of preferred. One share of United preferred has a call on four shares of common. Each share of Northwest preference stock is convertible into one and one-half shares of common.

This conversion feature is of great importance in cases where earnings begin to accumulate very rapidly and become available to the common stock in an increasing measure. Under such circumstances, the market quotations for the common shares are quick to reflect their improved outlook. As dividends income on the preferred shares are fixed at a stated amount, participation in a greater distribution of income that may be made available through increased dividend payments on the common is possible only through conversion of the senior equity into common shares.

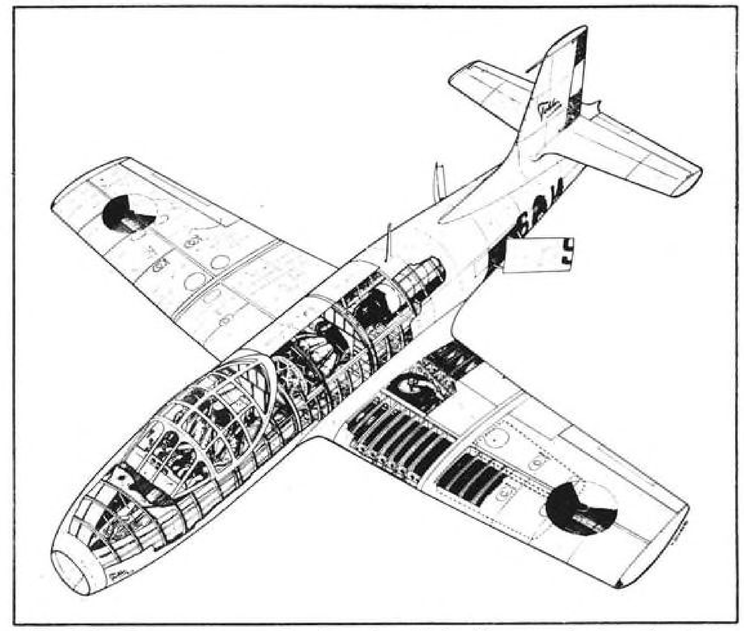
This development would unquestionably please the airline managements having preferred shares outstanding.

In the final analysis, the status of airline obligations and equities will be determined by the earnings outlook of the individual carriers.

—Selig Altschul

Fokker Has Broad Production Program

Includes jet and piston-powered fighters and training craft.



Fokker S.14, Derwent-jet-powered trainer, has side-by-side seats, fuselage dive brakes.

After Britain and France, Holland is the most significant Atlantic Pact air power on the Continent. Although its industry is small it is highly organized, and on the showing of its remarkable postwar recovery from near destruction by the Germans, is capable of rapid expansion.

Main Dutch design and production unit is the Fokker concern, with De Schelde and Aviolandia doing little at the moment except for repair work.

These three companies were grouped in 1947 at Government dictation. Although the joint concern was legally inaugurated, in effect the three participants went their own ways and the Government has finally sanctioned the demise of the short-lived United Dutch Aircraft Factories group.

► **British-Dutch Plan**—One of the biggest moves yet towards the integration of air defense between the European members of the Atlantic Pact is the arrangement between the British and Dutch Governments whereby the latter will build a large number of Gloster Meteor Jet interceptors of a new type for their own air force and for the Belgians. These will supplement the Meteor 4s already supplied by the British to both air forces.

Actual production arrangements are between Gloster Aircraft Co. and Fokker of Amsterdam for several hundred Meteor 8s to be built in Holland. Jigs are already being installed in the Amsterdam factory, with assembly of the first 50 machines from parts sent by Gloster slated to commence before 1950.

Remainder of the order is expected to be built entirely by the Dutch and should start coming off the line in early 1952.

The Belgians should receive half of the total batch and will supply Rolls-Royce Derwent 5 jet engines from one of their own national arsenal factories under a license being negotiated.

Latest report from Amsterdam states that the Dutch Government has placed an order for 300 Gloster Meteor twin engine jet fighters with Fokker. This is the largest order ever obtained by Fokker and will enable it to continue its planning for a new type of civil aircraft. It is also the first example of Benelux industrial coordination and promotes standardization of West European air power.

► **Training Phases**—Two Dutch fighter squadrons are already using British-made Meteor 4s, and to make an easy transition from Dutch Harvards to the jets, several Meteor 7 two-seat trainers are also being supplied.

The Meteor 8 is a still peppier version of the Mk. 4 and should do even better than the latter model which, with a 7350 fpm. rate of climb and a 47,000 ft. ceiling, is already one of the best interceptors in quantity service anywhere.

Further Meteor squadrons will form up as planes and crews become available, but, as in Britain, recruiting for the Dutch Army Air Force is still a problem. Also, at the war's end only a small core of RAF-trained Dutch veterans and the remnants of the pre-war Dutch air services existed and these have had to train a large number of raw personnel into qualified aircrews and ground technicians.

This training is still going on and in fact forms the major part of present Dutch air service work.

With an overlarge jet fighter component planned for its air force, Dutch role in an assault upon the Atlantic Pact nations would be mainly defensive and coordinated with other Continental Pact members to form a protective fighter screen about the arsenals and main offensive bases of the United Kingdom.

► **Fokker Activity**—Apart from their Meteor contract, Fokker is engaged on some interesting work of its own. Under Air Force direction they are committed presently to the design and production of new training aircraft. Fokker chief designer Beeling feels that after experience in building and testing the Meteor, the company will be able to come up with something of its own in this field.

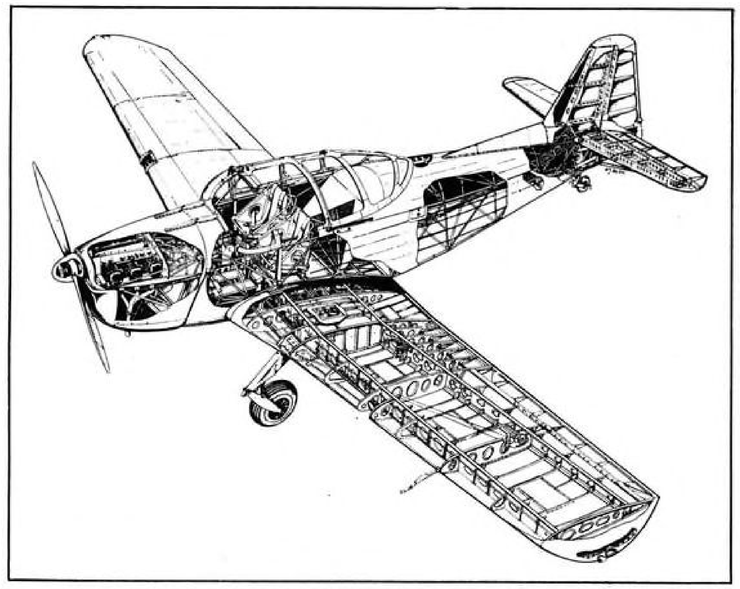
Meanwhile, various transport and freighter design proposals have been submitted to KLM but so far have no concrete backing.

The speedy F. 26 Phantom twin-Nene jet airliner is shelved for the time being—the design was far too radical to arouse more than passing interest from airlines.

► **Specific Craft**—Present Fokker production is as follows:

• **S.11 Instructor.** One hundred of these primary trainers are on order for Frits Diepen, Dutch sales organization for Fokker lightplanes.

The Army Air Force is at present ne-



Lycoming-powered S.11 trainer also has side-by-side seats. Nose wheel version is S.12.

gotiating for 10 of these for service testing, 10 will go to civil schools and another 10 to the Dutch East Indies.

The S.11 was designed with recent British trainer ideas and experience in mind in that it features the side-by-side seating with provision for a rear third seat (AVIATION WEEK, June 6, 1949). In step with current American and British practice, performance is better and equipment more comprehensive than prewar-vintage primaries.

In the hands of British test pilots at Hullavington, RAF experimental training base, the S.11 came out with a top score, and many hinted it would have been a better choice for the RAF Volunteer Reserve than the tandem-seat, Canadian-designed Chipmunk.

The flat-six Lycoming O-435-A is an excellent choice of engine, since the cowling lines flow naturally into the wide cockpit, but, dollars being scarce in Europe, foreign buyers may specify the alternative Cirrus Bombardier or French Mathis G.8.R.

• **S.12.** This craft is the S.11 with a nose wheel. Idea behind introduction of this model is that a training organization can use both planes and teach nose wheel and tail wheel landing techniques with the same basic type.

The S.11 and S.12 are not readily convertible one to the other, however. To provide for adaption of both undercarriages would mean an increase in structure weight, and in any case would be bad business. As it stands, an organization using S.11s, also wanting to teach nose wheel technique would either have to have some of its aircraft factory-converted or order S.12s outright.

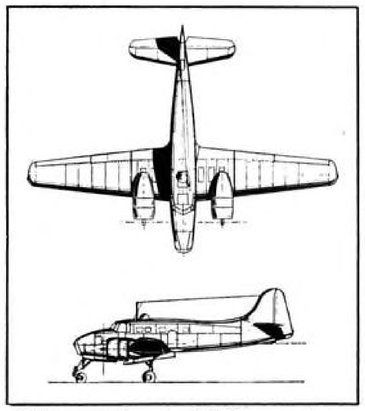
In either case, duplication of spares would be avoided, since both types are otherwise identical.

• **S.13.** This plane is being built for the Army Air Force to replace British Ansons and Oxfords as crew trainers, and provides better single-engine performance, range, load, and crew capacity.

The Pratt & Whitney-powered prototype is nearing completion and should undergo vibration tests in September.

• **F.25.** The last batch of Promoter four-seat pusher personal planes were on the line in May. Partly because the American engine had to be bought in short-supply U. S. dollars, sales of this sophisticated little aero-limousine have been slow.

• **Sea Fury.** Twenty-five Sea Fury Navy fighters are slated to be built for the Naval Air Service, first of which should be ready in mid-1950.



S.13 crew trainer has P&W powerplants.

Parts are already being made, and the batch will eventually find its way to the Light Fleet Carrier "Karel Doorman" or other carriers under construction in Dutch Navy yards.

• **S.14.** This craft is probably the first turbojet trainer designed from the start to incorporate latest RAF trainer ideas. The British Athena and Balliol are turboprop trainers and, in any case, are in a different power and performance category.

Designed specifically for advanced jet pilot training, the S.14 has a de-rated Derwent 5 and should operate at about 350-450 mph.

Extremely high performance is not desirable during advanced tuition, but Fokker is not overlooking the possibilities of a hotted-up model for night fighting and other purely military roles.

Fokker submitted their original design to the British Ministry of Supply for suggestions and have incorporated most of the ideas in the RAF-type specification they received in return, perhaps with an eye towards RAF custom if the S.14 is successful.

► **S.14 Design Data**—The plane is a cantilever low-wing, all-metal configuration with retractable tricycle undercarriage. The tapered wing consists of 4 parts—2 center-sections bolted to the fuselage and two detachable outer panels. Split-type landing flaps are used.

In addition to the fuel tanks in the center sections, two cells are carried in each of the outer panels.

Center-section tanks have electrically driven booster pumps to direct fuel to the engine. Fuel from outer tanks is fed to the engine by air pressure.

Fuselage has a circular cross-section. Makeup is of light-metal construction, with the exception of the engine compartment, where steel is used.

The body is divided as follows:

• **Fuselage nose,** in which the nose-wheel is retracted in forward position. Installed here are armament and compressed air apparatus, valves and cocks of the pneumatic system for the operation of undercarriage and dive and landing flaps.

Air-intake in the nose divides in two channels, running on each side of the retracted nose-wheel.

• **Cockpit,** accommodating a pupil and instructor, seated side-by-side, with dual controls. Behind the two front seats (ejectable) a centrally placed third seat, radio or radar installation can be fitted.

The various levers and handles are fixed to a control box in the center between the two pilots, with the exception of the throttle and dive-brake controls, which are installed on each side.

Ailerons, elevator and rudder can be locked from the cockpit.

Electrical installations, with the exception of the batteries, which are installed on the cockpit floor, are located

beneath the floor and can be easily inspected via skin doors.

Oxygen equipment is installed in the cockpit.

The hood can be opened rearward manually or electrically and is jettisonable.

• **Engine compartment,** situated in the center of the fuselage above the wing, and surrounded by steel walls.

Space between engine and wall allows all engine parts to be easily accessible through inspection openings in the upper and lower fuselage skins.

The engine-driven accessory gearbox mounts a generator, air compressor and vacuum pump.

• **Fuselage rear compartment,** accommodating the jet pipe, which is surrounded by a cooling channel.

The exhaust pipe is mounted on trunions, allowing the pipe to be pushed back for turbine blade inspection.

Dive-brakes are fitted on both sides of the fuselage, behind the wing.

The cantilever stabilizer, fixed on the upper side of the fuselage, is of light-metal, stressed-skin construction.

Elevator, also of light-metal structure, is statically balanced and is provided with a trim lab adjustable in flight.

Vertical fin forms one unit with the fuselage tail.

The light-metal rudder is fitted with a ground-adjustable trim tab.

Mainwheels and nose wheel are levered suspension type with Dowty liquid spring shock-absorbers.

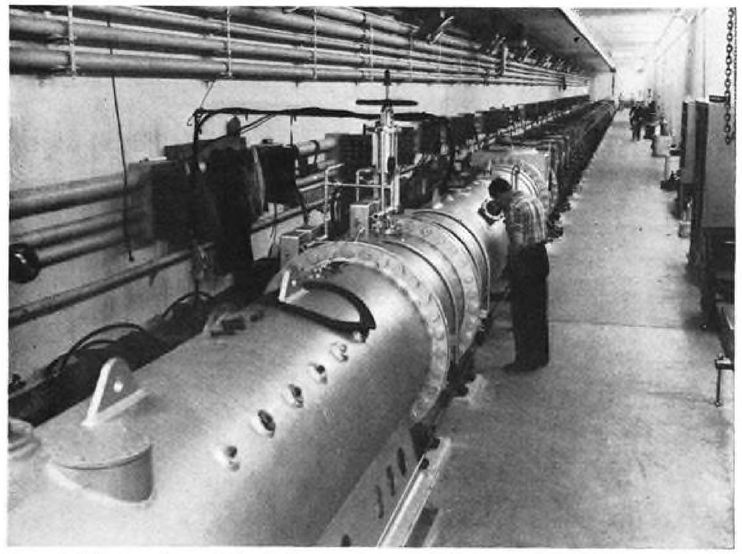
Mainwheels are retracted inwards into the center section, between the main and auxiliary spars.

► **Difficulties**—In step with its extensive and important production commitments, Fokker is building a vast new factory at Schiphol, the Amsterdam airport. First hangar is nearly complete, and piles are being driven for the main building blocks.

However, some serious difficulties are clouding the outlook of Fokker's ambitious program. Due to several circumstances, one of which is failure of the merger with the other aircraft factories, no annual reports for 1947 and 1948 have so far been published. It is believed that substantial losses have been sustained.

Difficulties are said to be mainly of a technical nature. The Promotor executive aircraft, for example, had been equipped with a propeller which turned out to be unsuitable. The Spanish government, which had purchased a number of these aircraft, refused to accept them. Dutch authorities withdrew their certificate for the plane, because of the propeller difficulty. New propellers have been ordered in the United States.

Some difficulties have also arisen in regard to the new S.11 trainer, and orders for this aircraft have remained below expectations.



Pressurized range for model missiles in new aeroballistics facility at Naval Ordnance Laboratory. Successive camera installations along tube's length record projectile's behavior.

Navy's New Aeroballistic Range

Pressurized, 300-ft. tube used for missile study under wide variety of conditions Cameras record action.

By Robert McLarren

Progress in aeronautical research demands, first of all, progress in the design, construction and operation of research equipment. In this respect, the United States is easily a decade ahead of the rest of the world. But this was not so prior to V-E Day, when Germany led the world by a safe margin.

Our scientists are only now beginning to move out ahead of where the Germans were more than four years ago. It has taken that long to improve and, in many cases, to duplicate the equipment and techniques in use or planned by the Nazis.

► **Missile Range**—An important example of such German-conceived equipment is the pressurized acroballistic range recently dedicated at the new Naval Ordnance Laboratory, White Oak, Md., near Washington, D. C.

This device consists, essentially, of a sealed tube three feet in diameter and 300 ft. long, down the length of which a model missile is fired. Along the length of this tube are 25 camera stations which photograph the missile in three dimensions as it progresses down the tube.

Importance of the NOL version of this unit is that it can be pressurized to six atmospheres or evacuated to a pressure of only 0.001 atmosphere, providing a wide range of Reynolds numbers for tests.

► **German Idea**—The basic idea for this new facility was developed by the Germans at the Luftfahrtforschungsanstalt Hermann Göering (LFA) near Braunschweig, Germany. One of the facilities at this fabulous research center was the Höhenkanal, or high-altitude ballistics range, concealed in a building resembling an innocent farm house.

This underground range was 1440 ft. long and 25 ft. in diameter. It could be evacuated to a pressure of 0.02 atmospheres to simulate fire from aircraft at very high altitude. Stationed at intervals along the range were Blitzgebers, or spark apparatus, which were located opposite two cameras (one vertical, one horizontal), which took three pictures at 1-millisecond intervals.

The camera shutters were left open in the darkened tunnel and the sparking provided the light to expose the photographic plates. The sparks were triggered by the missile making contact between two thin sheets of tinfoil as it approached each station.

► **Improvements**—Scientists of the NOL have improved upon this basic idea in several important ways, chief of which is pressure range that can be covered. The importance of this range lies in the ability to produce wide variations in Reynolds numbers, an index to the intensity of aerodynamic action.

There has been considerable discussion among research scientists as to the efficacy of evacuating the LFA range in order to simulate high altitude conditions. The Germans apparently thought that if they used full scale weapons in the range, then evacuation of the tunnel would produce Reynolds numbers equivalent to those encountered when firing the same weapon from an aircraft at high altitude.

While this is, of course, quite true, scientists point out that, since the reduction of the density in the tunnel greatly reduced the intensity of the aerodynamic action, the accuracy of the results was impaired and measurements rendered more difficult.

► **Reason for Pressurization**—This latter line of reasoning prompted NOL scientists to design a range which could be pressurized. Since the tunnel can be pumped to six atmospheres and full-scale speed used, the results are directly applicable to a missile six times as large as the model.

These results can also be used for the design of missiles any given times as large as the model through the use of suitable extrapolation coefficients, but their accuracy varies inversely as the scale of the full-size missile.

The ability to evacuate the range to a pressure of 0.001 atmosphere permits simulation of conditions existing at about 150,000 ft. altitude. Wind tunnel work at this high simulated altitude presents problems in superaerodynamics (AVIATION WEEK, June 20, 1949).

As the density of the air is reduced, the boundary layer grows in thickness until at only moderate supersonic Mach numbers it can completely fill the throat. This boundary layer depends upon the length of the object along which the air is flowing, in this case the tunnel wall.

By using static air within the range tunnel, and firing the missile through it, the boundary layer on the missile will be quite small compared to the tunnel diameter. Therefore, test results can be obtained at much lower densities and much higher Mach numbers. Thus, the new range also has great promise as a means of extending data into the ranges of hypersonic and superaerodynamic flows.

► **Construction**—The 300-ft. tube was built by the Naval Gun Factory and is made up of one-inch-thick rolled steel plate sections connected with flanges. The tube weighs about 100 tons.

The Naval Gun Factory made numerous jigs, gages, etc. that enabled them to hold tolerances equal to those used in guns and machinery aboard ship. The tube is mounted on National Pipe and Valve Co. T-slot supports, enabling the building to expand and contract under the tube, which has only one end fastened to the floor.

The 25 photographic stations consist of a timing, a sparking and a filming device to register the three-dimensional attitude of the model and the time of the picture. Two sheets of photographic film are used, one mounted vertically and one horizontally. The horizontal plates follow the curvature of the earth to within ±0.001 in. as measured from a water table, and are level within 0.001 in. per foot.

All other dimensions, such as the alignment of the vertical plates, distance of vertical plates from centerline, distance of spark from mirror, etc., are held to comparable tolerances. The surface plate holders, mirror mounts and other interior parts were made by the Wilmer Machine Tool Co. and the Balmar Corp. of Baltimore, Md.

► **Photo Apparatus**—Each station is equipped with a source of light and a photoelectric cell on opposite sides of the photographic station. As the test missile interrupts this light, the cell actuates a short-duration spark.

The light from this spark flashes directly across the station to a vertical photographic plate and, simultaneously, upward to a mirror which reflects it down to the horizontal photographic plate on the tube floor. At the same time the spark sends a signal to an RCA counter, which is capable of detecting one ten-millionth of a second.

Each photographic plate holder has a base line and a reference mark which are exposed onto the film by the spark. The attitude of the model in pitch and yaw together with the exact time of the photograph is obtained. Any seven of the 25 stations can be connected into the timing device, permitting either a full-flight record at slightly longer time intervals or a record at very close intervals over a portion of the flight, depending upon the conditions of the test.

In order to establish and maintain the desired conditions within the tunnel, vacuum pumps, pressure pumps, dryer and humidifier are available, thereby permitting stabilization of the desired Reynolds number of the tests.

► **Models**—The test models are machined from solid steel to exceptionally close tolerances, necessary because of their small size and the high Reynolds numbers desired. A sabot secures the model to the rifling of a 20-mm. gun barrel and is removed after firing by a guard slightly downstream of the muzzle.

This gun is a 40-mm. type necked down to a 20-mm. barrel in order to provide extremely high pressures and muzzle velocities.

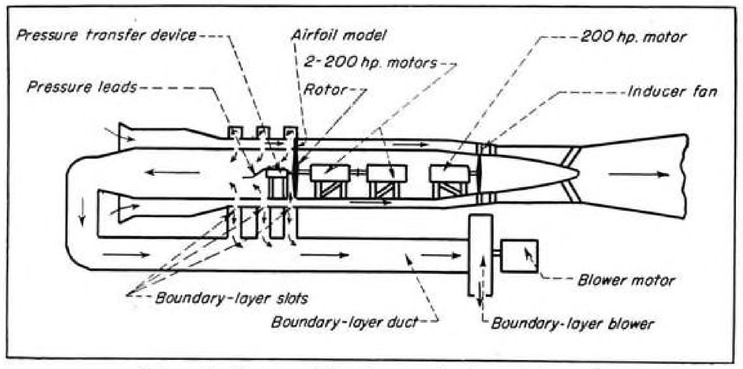
Present equipment can produce an initial model velocity of 6200 ft. per sec. The model drops from a fraction to several inches (depending on its velocity) during its traverse of the range and comes to rest in a sand butt.

► **Supplements Tunnels**—The new aeroballistic range is intended to be used in conjunction with the Kochel wind tunnel now in operation at the Laboratory to check and amplify wind tunnel test results. Its pressure range from a near-vacuum to six atmospheres greatly extends the range of the data to determine exact Reynolds number effects at speeds up to 5000 mph.

The new range combines features of the wind tunnel, the free-fall method and the rocket test method all in a single facility and thereby comprises an important new research tool that complements existing equipment and extends the range of data available into new areas.

COPTER TRAILER CUTS FLIGHT COST

Designed to cut operating costs, this neat trailer designed for Hiller 360 enables crop dusting operators to tow 'copter directly to agricultural area where craft will be used. Tow truck doubles in duty by carrying extra fuel, insecticides, and personnel.



Schematic diagram of Langley annular transonic tunnel.

First Successful Transonic Tunnel

NACA research facility uses rotating arm to carry model, eliminates troublesome "choking" condition.

Research engineers have been frustrated since shortly before World War II by the seeming impossibility of attaining accurate wind tunnel data at the speed of sound.

As Mach number 1.0 is approached closely in a wind tunnel, a normal shock wave is formed across the most restricted area of the throat, which is usually directly across the model, since its presence in the throat reduces the free area to a minimum. As this "choking" condition occurs, shocks bounce from the model to the tunnel wall and back to the model, destroying the accuracy of the data being recorded.

► **Solutions Vary**—To obviate this condition, scientists have evolved a number of expedients, some simple, some very elaborate, all of which involved extra-tunnel techniques, including free-drop, wing-flow, and rocket-body systems.

One thing could be done in the tunnel itself: the "bump", which provides highly localized regions of sonic speed and in which data may be obtained provided the tunnel is very large in relation to the model.

► **Stack's Plan**—It was at a time when the most renowned aeronautical scientists of the world had resigned themselves to such methods of obtaining data at sonic speed that John Stack, NACA research scientist and 1947 Collier Trophy co-winner, evolved the system shown in the accompanying schematic diagram.

By mounting the model on an arm, which rotates in a free-stream, he avoided the chronic "choking" effect and made possible the first accurate recording of data smoothly through the transonic zone.

Development of large-scale transonic throats for wind tunnels (Aviation Week, June 20), will give even better results than Stack's device by enabling tests of larger models. But Stack's system, as the first practical solution of a research bottleneck, is worthy of study for other possibilities.

► **Operation**—The tunnel consists of an internal cylinder which creates an annular space through which air is drawn by a 200 hp. inducer fan. The model is mounted within this annular space on an arm which rotates about a longitudinal axis.

The model follows a helical path with respect to the airstream, and this makes it possible to attain sonic speed in a subsonic air stream. Because of this latter fact, no problems of tunnel choking are presented, although data at the speed of sound actually is being obtained.

► **Boundary Layer**—Since the region in which the model is operating is restricted, boundary layer problems are more serious than in the case of a small model in the center of a large airstream. Therefore, boundary layer suction is used along the inner and outer walls of the tunnel forward of the location of the model.

The problem of sucking away this boundary layer required the use of an internal duct, the flow in which is created by a blower. The air is drawn forward from the slots, carried out the inlet bell of the tunnel, and routed down and rearward, where it is exhausted through the blower.

► **Only 600 Hp.**—The model is rotated by two 200-hp. motors geared to a single shaft and the entire tunnel requires only 600 hp. for operation. However, this small power, together with the comparatively small size of the tunnel and model, permits two-dimensional testing only at low Reynolds numbers and, therefore, limits the effectiveness of this particular installation.

One of the problems posed by this tunnel configuration was that of balances. This was solved by an ingenious pressure transfer device which carries manometer pressures from the model surfaces down through the whirling arm and into the shaft. It is taken from the shaft through a series of pressure-tight transfer rings and thence to the manometer board.

The tunnel has been in operation at NACA Langley Aeronautical Laboratory at Langley Air Force Base, Va., for more than a year.

Fiberglas Blades Pass Flight Tests

Molded Fiberglas helicopter rotor blades have been successfully flight tested at Wright-Patterson Air Force Base, Dayton, Ohio, by the Air Materiel Command. Installed on a Sikorsky H-5 helicopter, results indicate increased lift and reduced power requirement. The blades were developed by Cornell Aeronautical Laboratory, Buffalo, N. Y., under AMC research contract.

The blades have a 20-in. chord and are about 22 ft. long. Molded in a single operation, they use a lightweight balsa core.

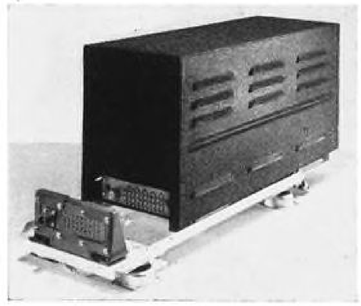
High pressure permits the maintenance of an extremely smooth aerodynamic surface finish.

► **Molding Process**—First step in the process is to carve a blade from balsa wood with dimensions only slightly less than the finished blade. The balsa is then wrapped with Fiberglas cloth saturated with a liquid plastic. The wrapped blade is then placed in a metal mold and heat and pressure are applied. The 230-deg. F. temperature hardens the plastic and the 140-ton pressure molds the plastic cover into a smooth, aerodynamic shape.

► **Improves Performance**—The greatly improved fairness and rigidity of the new blades reduce drag, thereby increasing L/D ratio and making possible increased payload. The airfoil section is kept to very close tolerances, thereby improving performance. Reduction in blade flexing due to increased rigidity preserves the aerodynamic form of the blade segments, also contributing to increased performance.

Cornell laboratory is continuing its research with emphasis on a new core honeycombed with Fiberglas cloth. It is said that these new blades, upon completion, will be even lighter than the present balsa core blades but will retain the same degree of aerodynamic efficiency.

NEW AVIATION PRODUCTS



Prop Synchronizer

Improved propeller synchronizer designed to meet requirements of latest military and commercial multi-engine aircraft, is announced by **Curtiss-Wright Corp.**, Caldwell, N. J.

While retaining operational features of previous Curtiss rpm-synchronizers, new design facilitates installation and servicing by enclosing mechanism in standard radio-rack type metal case supported by new shockproof mount.

Between permanent mounting and removable synchronizer case is plug-in electrical and mechanical connection. To install synchronizer, it is only necessary to slide metal case into place after setting cockpit control lever in takeoff position.

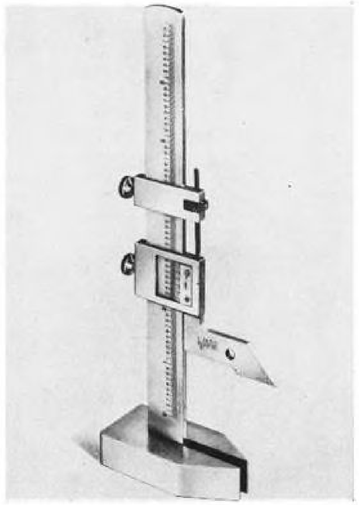
Built-in filter eliminates need for conduit connection between synchronizer and separate filter component. Provisions also have been made for use of standard engine tachometer, calibrated to indicate precise synchronizer rpm., instead of special tachometer previously used. Dimensions are 8¼ × 12½ × 23½ in.

Abrasive Wheels

For heavy grinding, light sanding and for certain types of cutting, deburring and finishing operations, resin-bonded "Fibrex Red" wheels made from laminated sheets of cotton fibre filled with abrasive grain, are offered by **Simonds Abrasive Co.**, Tacony and Fraley Sts., Philadelphia, Pa.

Wheels are supplied in 7 and 9 in. dia. depressed center type for portable disc sanders and right angle grinders, and in 6, 8, 10, and 12 in. dia. x ⅛ in. thick straight discs for cutting and general use. Material is said to permit certain amount of side pressure without risk of breakage, to cut fast and clean without tearing at edges.

Wheels are claimed to be especially suitable for weld grinding on stainless steel and for cleaning rough surfaces on structural steel work, fabricated metal parts, etc. They will cut BX cable, Transite, Celotex, Masonite hardboard, plastics, asbestos as well as most metals.

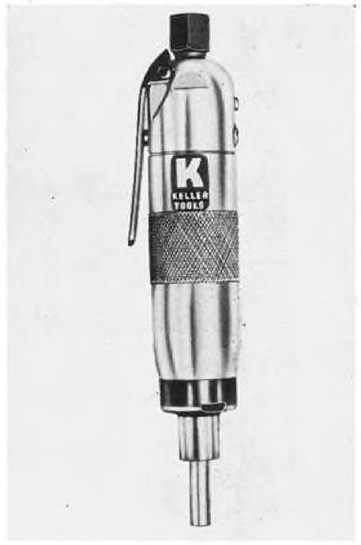


Measuring Device

Designed to speed work of tool makers, inspectors and bench workers, Vernier height gage has slotted base which permits direct readings from 0-6 in., and eliminates necessity for computations and consequent possibility of errors.

Made by **Vard, Inc.**, 2981 E. Colorado St., Pasadena 8, Calif., scale is adjustable and zero setting can be maintained at all times. Unit incorporates scriber point on jaw for direct layout on parts and hole in jaw permits quick attachment of indicators for all types of inspection.

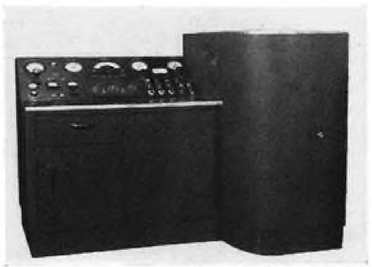
All gaging surfaces are hardened tool steel. Use of beryllium copper leaf springs in contact with beam prevents beam wear. Unit is satin-finished to eliminate glare and is small enough to fit average tool box.



Small Rivet Tool

For light riveting operations with soft-metal tubular and standard rivets, "Pin Riveter," offered by **Keller Tool Co.**, Grand Haven, Mich., is also claimed to be useful for setting small drive screws and for light peening and scaling on thin sheet-metal, Bakelite.

With ¼in. stroke, it has speed of 9000 blows/min. Device weighs 13 oz., is 6⅛ in. long and has piston dia. of 19/32 in. Tool is supplied with blank rivet set.



Tests Prop Governor

Improved "Governmatic" for airline service, made by **Greer Hydraulics, Inc.**, 454 18th St., Brooklyn 15, N.Y., features larger cabinet, bigger variable speed drive, and larger feathering pump circuit.

New unit makes possible testing late model prop governors having greater output and higher operating pressures. Drive power has been increased from 5 to 7½ hp. Feathering circuit has 2 hp. motor and 3 gpm. pump, instead of ½ hp. motor and ¾ gpm. pump previously used. It is claimed improvements on device permit testing governor in less than 10 min.

Lay-out Aids

For laying out work, checking flat surfaces and general shop use, close-grain, cast-iron surface plate, made by **South Bend Lathe Works**, South Bend 22, Ind., is represented to have high resistance to wear. Plate is heat-treated to prevent distortion, has precision-ground surface and machined edges. Bottom is heavily ribbed and incorporates three point support. Dimensions are 12 × 17 × 3 in. with a ¾ in. thick top.

V-blocks, offered for use with surface plate, are made of hardened steel and are precision ground. Supplied in matched pairs only, blocks have clamps with knurled screws which are cross-drilled for tightening with rod. They are 2⅛ in. wide, 2¼ in. long and 1⅛ in. high. Capacity of blocks for round work is ¼- 2 in.-dia. material.

Speeds Welding

"Eutec-Hand-Omatic" electrode, offered by **Eutectic Welding Alloys Corp.**, 40 Worth St., New York 13, N. Y., is pressed against metal to be welded and drawn like a pencil on the surface without back or forth motion.

Represented to permit greater welding speed and to save up to 50 percent in electrode material, tool automatically lays beads smoothly and regularly. After welded joint cools, slag is said to lift by itself, leaving weld clean and unoxidized.

For use with a. c. and d. c., electrode has tensile strength of 70,000-80,000 psi. and comes in several models and sizes: No. 1 for all position welding, 3/32, ⅛, and 5/32 in.; No. II for flat and horizontal fillets, ⅛, and 5/32 in.; No. III for under water use, ⅛, and 5/32 in.

Portable Arc Welder

For small fixed base shops and maintenance crews, portable a.c. transformer arc welding machine, offered by **Air Reduction Sales Co.**, 60 E. 42 St., New York 17, N. Y. has rated maximum output of 200 amp. and is completely self-contained.

Unit has these features:

Two ranges of current adjustment with stepless control throughout each.

Capacitors supplied in secondary circuit for easy arc starting and stability.

Built-in capacitors in primary circuit, affording power factor correction.

Crank handle on top of machine for adjustment to any desired setting.

Windings fully insulated with heat-resistant spun-glass fibre.

Primary "on-off" switch and 10-ft. length of three-conductor, rubber-covered cable with lugs attached.

ENGINEERING FORUM

Can't Laugh Off Stall Warnings

They'll do it every time! No matter how worthy the cause or how great the need, someone always comes up with a "What's the use?" This time it's stall warning devices. But Mr. Chapman (AVIATION WEEK, June 20) at least asks for disproof of his opinion that, in the majority of spin-stall accidents, a warning signal would simply indicate to the pilot "that he was beyond hope and that a crash was inevitable."

The general nature of Mr. Chapman's remarks seems to indicate a rather common misapprehension: That in a majority of cases the pilot is doing himself some good by operating on the verge of a stall. Actually, just the opposite is the case. Common excuses for stalling, for example, are attempts at climb boosting, glide stretching, or turn tightening. I know of no personal plane for which the speed of steepest climb, flattest glide, and tightest safe turn isn't at least 10 mph. above stalling speed. Thus, in most cases, flying close to the stall is not only dangerous but defeats its purpose.

Just for argument, Mr. Chapman, let us imagine one of your desperate situations. Suppose your engine quits at just the wrong moment in climbing out of a small field. Desperate enough, perhaps, but no reason for pulling desperately back on the stick and spinning in. If there is any time you want reliable information in no uncertain terms, it is now. If you are sensible enough to have provided a stall warning, at a speed about 10 mph. above actual stall, you will know that, aside from a momentary inertia effect (which gives a slight further margin of safety), you can get the very most out of the situation by keeping on the upper edge of the stall **warning**. Turn? Certainly, provided you ease out of it every time the horn starts to blow. Without a positive, reliable warning, you have only your own worse than futile emotions to guide you, apparently justifying the conventional advice to avoid any turn in such a situation. Finally, with inescapable knowledge of the conditions given by a stall warning, if you want to pancake or spin in, you can still do it.

It is unfortunately true that a spin-proof airplane can develop an excessive rate of descent if stalled prematurely (but too low to permit speeding up again before the final flare-out). Still more dangerous to the occupants can be an attempted climb at insufficient speed. Here it must be appreciated that, although we customarily think and speak in terms of speed, all these maneuvers really depend more on angle of attack. Approach to the stall in particular, for all practical purposes, is exclusively a function of angle of attack, independent of any other operational condition for a given wing section. What a properly designed stall warning does is to give the pilot vital knowledge of this most important of all operating conditions, in form that takes none of his attention from other things. And if he must operate really close to the stall for some special reason (as in approaching a carrier deck) a reliable stall warning is obviously of still greater importance.

Any way you look at it, you just can't laugh it off!

RALPH H. UPSON,
Professor of Aeronautical Engineering,
University of Minnesota,
Minneapolis, Minn.

British Jet Maintenance Explained

Your paragraph entitled "Jet Facts" in your "News Sidelights" for June 6th reveals some lack of knowledge about the determination of aero engine overhaul periods.

No authoritative person has claimed longer overhaul periods for British jet engines in service than those given by Mr. G. R. Edwards in the lecture to which you refer. Presumably you must have had in mind the exacting tests successfully undergone by some British jet engines under strict official observation. The Goblin, for example, did a run of 100 hr. under full combat conditions. The Theseus turboprop ran 500 hr. on endurance test for the Ministry of Supply; maintenance hours aggregated 31 man-hours.

There is every reason to believe that British gas turbine engines will achieve overhaul periods of 1000 hr. and longer, as time goes on, but an essential condition precedent to increase of overhaul periods is that sufficient engines run the number of hours stipulated by the Royal Air Force and the Air Registration Board. Both bodies are commendably cautious and play safe all the time.

In extending the period of duty between overhauls the Royal Air Force is applying to gas turbines the same strict rules as for piston engines. They require that at least six engines of the type under review shall complete the increased overhaul period aimed at, and upon examination shall reveal no flaw. In point of fact, the Goblin is about to be approved for 300 hr. running between overhauls, but in peacetime a year may elapse before six engines each complete 300 hr., are examined and a decision taken to increase the overhaul period by another 50 hr. Yet officially observed tests indicate the Goblin is already good for 1000 hr.

Your readers may be interested to know that the Ghost, which is the engine designed for the Comet four-jet airliner, will start its civil career with an overhaul period of 240 hr. Incidentally, both the Goblin and the Ghost have recently improved their fuel consumption—that of the Goblin is now 1.18 lb./lb. thrust/hr. and that of the Ghost 106 lb./lb. thrust/hr.

Yours faithfully,
E. C. BOWYER, Director,
Society of British Aircraft Constructors, Ltd.,
London, Eng.

PRODUCTION

AIR ASSOCIATES Teterboro building heads up distributor network and also houses . . .

. . . MANUFACTURING FACILITIES to produce aircraft parts and equipment.

Diversity Pays at Air Associates

Teterboro distributor for 2500 different items also manufactures, exports, and engineers aviation products.

If Air Associates' sales volume was based on the size of its merchandise catalog, the company would be in for its biggest year of business, since this year's catalog is the largest of its kind ever produced. Actually, it's another indication that Air Associates this year is going after business in a big way.

Since it actually manufactures many of the products it sells, Air Associates is probably one of the most diversified distributors in aviation. In addition to its own line, the company handles about 2500 standard products, ranging from scale-model Lockheed F-80s mounted on chrome ashtrays ($11.50 ea.) to flying instruments, windcones, propellers, tires, turnbuckles, rivets and sheet metal.

▶ **Inventory Over $1 Million**—Current on-the-shelf inventory is valued at over $1 million. But Air Associates rapidly is becoming noted also for its ability as a prime manufacturer, producing to order such articles as rotary actuators, servos, power units, control valves, screw jacks and radio equipment. Manufacturing facilities are centered at the Teterboro, N. J., branch of the company.

Right now, like most of the industry, more than half of the company's work is with the government, either under direct contract or subcontract.

Air Associates' business falls into three categories—exporting, distributing and manufacturing—and the company maintains branches at Dallas, Chicago and Glendale, Calif. Total employment, which reached about 1500 during the war, has now settled to about 600.

• **The export business**, which includes complete airplanes as well as parts and equipment, has been slack for two reasons: Dollar exchange and national policies of foreign countries are continually fluctuating; and large volumes of U. S. war surplus still hang on the market. Air Associates maintains representatives in 50 foreign countries.

• **The distributor business** is aimed at aircraft manufacturers, Air Force field depots, and dealers covering the company's manufactured items, as well as stock supplies. In addition, Air Associates maintains a retail store at Teterboro for private pilots.

• **The manufacturing business** concentrates mainly on producing hydraulics, electrical and mechanical actuating motors and radios. Currently Air Associates ships over 200,000 manufactured units each month.

While actuating motors account for about 75 percent of manufactured items, the biggest dollar volume comes from the sale of radio equipment. Air Associates supplies the Civil Aeronautics Administration with two-thirds of the omni-directional range system equipment in its recent installation program. The company is working also on an electronic servo system for Navy pilotless aircraft.

▶ **Salesmen Essentially Engineers**—Essentially, all engineering is done at Teterboro. Sales, service and merchandising are main functions of the other bases. Air Associates salesmen are basically engineers. Their function, besides keeping the company aware of contracts and possible jobs on which to enter bids, is to keep airframe manufacturers appraised of the engineering capabilities of Air Associates.

The engineering staff numbers about 90, including draftsmen, and these men design and revise Air Associates equipment for tailor-made jobs, in addition to performing research into equipment problems. Actual manufacturing is done at Teterboro, and the company is fully equipped to perform production line work much the same as Detroit's automobile factories, except on a smaller scale. There has been an impression in some quarters of the industry that Air Associates is strictly a "hardware supply house," but their spacious manufacturing plant, with jigs, dies, lathes and other equipment, dispels it. So does their financial report.

▶ **Profit In 1949**—Early in calendar 1947 the company declared its last dividend. In that year it sustained a net loss of $280,000 after tax carryback credit. In fiscal 1948 the company showed a $75,000 loss. The first quarter 1949 profit after tax is $10,000.

Air Associates emerged from the war with a strong balance sheet but no earning power. Now, it has a net worth of about $2.5 million. Net current assets are approximately $2 million. Cash-in-receivable is more than sufficient to cover all liabilities except capital stock, although by itself, cash-in-receivable represents more than the capital value of stock.

▶ **Operated At Loss**—Rudolph F. Gagg

is Air Associates president. He took office in January, 1948. At that time the company had sustained a loss before tax credits for the fiscal year ending Sept. 30, 1947, of over $550,000, and it was continuing to operate at a loss.

In order to bring about the present happy financial situation, Gagg and his management put the Teterboro operation through a thorough reorganization, closed and sold the manufacturing portion of the Los Angeles plant where the radio equipment formerly was produced, and reorganized the engineering division, under Dr. K. C. Black. As a result of these moves, and an increased sales-promotion program, sales for the previous year totalled approximately $6 million, and it appears likely that this year's sales will not fall below last year's mark.

▶ **Motors And Seat Belts**—Biggest single items manufactured by Air Associates are its motors and seat belts. In addition to khaki, slate green and cerise, the seat belts come in varied colors—light green, maroon, light blue and brown—all to airframe manufacturer or airline specification. The company at the present time is the largest seat belt producer in the world.

Its government subcontracts also have been varied:

• **McDonnell Banshee:** A screw-jack system that operates flaps; a butterfly-type valve that regulates air intake in the nose.

• **Fairchild Packet:** A complete steering system, consisting of screw jacks, actuators, hydraulic valves and cylinders, steering wheel, etc., all manufactured in the Teterboro plant.

• **Republic F-84:** An actuator to open and close the canopy.

Other subcontracting work has been performed for Lockheed and Grumman Aircraft.

▶ **No Surplus Equipment**—At one time Air Associates handled war surplus aircraft, and it was during this period that the company fulfilled a request from an Argentine company to supply a complete airline, including parts, aircraft and accessories. But convinced that the market demand for war surplus was decreasing, Air Associates ended its agency agreement with War Assets Administration and returned the remaining inventory of aircraft and aircraft parts to the government.

▶ **Began As Club**—The company began more than 20 years ago as a club at Curtiss Field, Mineola, L. I. Private pilots pooled money and kept some spare parts on hand so they could repair their planes. Soon, pilots from other fields came over to Curtiss and began to use the equipment.

It was at this point that commercial aspects of the organization presented themselves. And it wasn't long until the group incorporated and went into business on a large scale.

Company officers, besides Gagg, are former Lt. Gen. Barney M. Giles, vice president; G. S. Kleveerstrom, secretary-treasurer; and E. J. Miller, assistant secretary. Gilbert Colgate is chairman of the board of directors which includes C. Kenneth Baxter, S. A. McClellan, Earl M. Newlin, Haven B. Page and Gagg.

C-124A Puts On Wings

At Douglas Aircraft's Long Beach plant, whale-like 127 ft. fuselage of C-124A is mated . . .

. . . with 173 ft. wing. Prototype of the transport is scheduled to fly in November.

Powered with four Pratt & Whitney 4360 engines, the C-124A is designed to carry maximum cargo load of 25 tons for 930 miles at 220 knots block speed. Main cargo compartment provides 10,450 cu. ft. capacity, with another 1150 cu. ft. in auxiliary compartments. Capable of carrying almost any military object except a heavy tank, the C-124A has a rear loading hatch with electric hoist, in addition to the huge nose door which lets down a ramp permitting vehicles to drive into the hold.

Aeronca Expansion

Aeronca Aircraft Corp. has purchased $300,000 worth of plant real estate, machinery and equipment at Middletown, Ohio, from the War Assets Administration. Aeronca has also obtained a $375,000 loan from the Reconstruction Finance Corp. Both purchase and loan are part of Aeronca's expanding subcontracting program.

PRODUCTION BRIEFING

► **Firestone Tire and Rubber Co.** is producing an Airpak shipping shell for Westinghouse J34 jet engines—a rubber-lined steel container designed to protect the engines from shipping shocks, pressurized to protect the engine from humidity.

► **Airwork Corp.,** Millville, N. J., has contracted with Coastal Air Lines, New York, to supply the non-sked carrier with Pratt & Whitney R-2000 engines on a flight-hour rental basis for contract runs between Newark and Tel Aviv, Israel, and Zurich, Switzerland.

► **Standard Thomson Corp.,** Dayton, has entered an exclusive licensing agreement with Teddington Controls, Ltd., England, permitting the Dayton plant to make precision instruments for electronic cabin temperature controls and inching devices for flap controls and other aircraft sub-assemblies.

► **Westinghouse Electric Corp.** lighting division at Cleveland is building 337 new slopeline approach lights for airports for the USAF, on specification recently approved as standard by the Army-Navy-civil committee.

► **National Aircraft Standards Committee** is drawing up a new specification for the use of titanium metal in military aircraft.

Air Market Associates, Dallas, manufacturers of the new lightweight Fly-Fone for pilots, has appointed Lindeteves, Inc., New York, as sole representative for distribution in all countries outside the U. S.

► **G. M. Giannini & Co., Inc.,** Pasadena, has opened a branch office in the Boeing Seattle factory, for liaison between Boeing and Gianinni's engineering development section, on fitting high speed flight instruments to space available in new airplanes.

► **Boeing Airplane Co.** expects its new single-point refueling system, which adds from 100 to 200 lbs. to gross weight of planes of Stratocruiser size will be applicable mainly for quick military refueling and will not be used in its present form in commercial planes because of the weight penalty.

► **Canadian Car & Foundry Co.** has virtually completed conversion work on approximately 200 North American Harvard (AT-6) trainers for RCAF.

► **Esso Export Corp. Marketer Affiliates** have been awarded the armed services Petroleum Purchasing Agency contract for refueling and relubing all USAF and other U. S. government planes at 72 airfields in Europe, South and Central America, Africa, Canada, Iceland, Bermuda and the Carribbean, for the third successive year.

Latest Air Force Bid Awards

Air Materiel Command procurement Division makes available to AVIATION WEEK the latest bid awards, shown on this page. Requests for further information should be addressed to Contracting Officer, ACM, Wright-Patterson AFB, Dayton, Ohio, attention: MCPPSX72.

ABSTRACTS

For bracket assemblies (49-1540):
Companies sharing—General Electric Co., Syracuse, on a bid of $9671; United States Rubber Co., New York, on a bid of $70.80; Garde Mfg. Co., Pawtucket, R. I., on a bid of $608; Stanhope Products Co., Brookville, O., on a bid of $7825, and Anti-Corrosive Metal Products Co., Inc., Castleton-on-Hudson, N. Y., on a bid of $6060.02.

For cameras (49-2457):
Bell & Howell Co., Chicago, on a bid of $321,214.34.

For clamp iron (49-1660):
Brubaker-Ugrin, Engineers, Beverly Hills, on a bid of $21,389.28.

For phenolic-sheet (49-1902):
Companies sharing—Taylor Fibre Co., Norristown, Pa., on a bid of $11,233; General Electric Co., Coshocton, O., on a bid of $92.16, and Continental Diamond Fibre Co., Newark, Delaware, on a bid of $1149.49.

For gasoline hose (49-2068):
Metal Hose & Tubing Co., Dover, N. J., on a bid of $8976.62.

For portable saws (49-2137):
Fred W. Wappat, Inc., Mayville, N. Y., on a bid of $5625.

For 88 demonstrator trainers (49-2226):
Companies sharing—G. Felsenthal & Sons, Inc., Chicago, on a bid of $333.75; Design Fabricators, Inc., Dayton, on a bid of $1929.25; Management & Research, Inc., Primos, Pa., on a bid of $11,310; Carleton R. Elliott Co., Dayton, on a bid of $3643.50; Instrument Laboratories, Chicago, on a bid of $2681.25; American Automatic Typewriter Co., Chicago, on a bid of $2565, and Imagineering Associates, Inc., Hollywood, on a bid of $20,586.72.

For test sets (49-2282):
Bendix Aviation Corp., Bendix Radio Div., Towson, Md., on a bid of $200,282.18.

For pump assemblies (49-2333):
Lear, Inc., Romec Div., Elyria, O., on a bid of $20,450.

For aircraft thermometers (49-2375):
Companies sharing—Weston Electrical Instrument Corp., Newark, N. J., on a bid of $3237.25, and Rochester Mfg. Co., Inc., Rochester, on a bid of $987.84.

For overhead projectors (49-2384):
The Walcott-Taylor Co., Inc., Washington, D. C., on a bid of $23,458.49.

For projector equipment (49-2385):
De Vry Corp., Chicago, on a bid of $803,037.18.

For projectors (49-2392):
Viewlex, Inc., Long Island City, N. Y., on a bid of $27,470.

For regulators (49-2406):
Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, on a bid of $108,680.65.

For recorder units (49-2414):
Companies sharing—Frederick Hart & Co., Inc., Poughkeepsie, N. Y., on a bid of $98,224.36; Piqua Engineering Inc., Piqua, O., on a bid of $41,929.92, and General Communication Co., Boston, Mass., on a bid of $5179.20.

For photographic paper (49-2448):
Companies sharing—Haloid Co., Rochester, on a bid of $22,846.41, and Anken Chemical & Film Corp., Newton, N. J., on a bid of $4484.73.

For tank fuel (49-2463):
United States Rubber Co., Mishawaka, Ind., on a bid of $71,760.

For control box (49-2468):
Companies sharing—Gibbs Mfg. & Research Corp., Janesville, Wis., on a bid of $59,842.50; Consolidated Radio Products Co., Chicago, on a bid of $37,479.02, and Colonial Radio Corp., Buffalo, on a bid of $81,855.29.

For indicators (49-2472):
Eclipse Pioneer Div., Bendix Aviation Corp., Teterboro, on a bid of $29,314.55.

For adapters (49-2501):
Kurz-Kasch, Inc., Dayton, on a bid of $5547.98.

For mounting & mounting base (49-1723):
Companies sharing — Aermotive Equipment Corp., Kansas City, Mo., on a bid of $5135.50, and White Tuning Corp., New York, on a bid of $1092.

For junction box (49-2452):
Hollenbeck Manufacturing Co., Los Angeles, on a bid of $3627.64.

For plungers (49-1690):
Companies sharing — Columbus Production Mfg. Co., Columbus, O., on a bid of $8732.80; Lagonda Tool & Engineering Co., Springfield, O., on a bid of $4195.40; Pacific Div., Bendix Aviation Corp., North Hollywood, Calif., on a bid of $1876; Rockwell Engineering Co., Blue Island, Ill., on a bid of $11,289; United Aircraft Products, Inc., Los Angeles, on a bid of $261.64; Neal Machine & Tool Co., Lima, on a bid of $875, and Jumbo Steel Products Co., Azusa, Calif., on a bid of $131,989.50.

For ring set & pistons (49-1738):
Companies sharing—Superior Piston Ring Co., Detroit, on a bid of $583; McQuay Norris Mfg. Co., St. Louis, on a bid of $4110.60, and Wilkening Mfg. Co., Philadelphia, on a bid of $7209.

For meter assemblies (49-2044):
Ralph N. Brodie Co., Oakland, on a bid of $417,868.72.

For antenna equipment & amplifier panel (49-2083):
York Band Instrument Co., Grand Rapids, on a bid of $16,233.26.

For meters & ammeters (49-2089):
Companies sharing—Marion Electrical Instrument Co., Manchester, N. Y., on a bid of $8041.92; California Electronics Supply Inc., Los Angeles, on a bid of $2746.80, and General Electric Co., Schenectady, on a bid of $1386.

For cable (49-2263):
Phelps Dodge Copper Products Corp., Habirshaw Cable & Wire Div., New York, on a bid of $49,627.09.

For lens assemblies (49-2270):
Companies sharing: Bell & Howell Co., Chicago, on a bid of $4569.15; Projection Optics Co., Inc., Rochester, on a bid of $501.70, and Buhl Optical Co., Pittsburgh, on a bid of $1113.20.

For aircraft generators (49-2283):
Westinghouse Elec. Corp., Dayton, on a bid of $137,657.

For 392 tables & costumers (49-2304):
Companies sharing—McConnaughey Stationers Inc., Springfield, O., on a bid of $8722.00, and Roth Office Equipment Co., Dayton, on a bid of $1323.

For 1712 belts (49-2407):
Aerial Machine & Tool Corp., Long Island City, N. Y., on a bid of $5698.80.

For aircraft generators (49-2426):
Westinghouse Electric Corp., Dayton, on a bid of $119,680.

For indicators (49-2428):
Kollsman Instrument Div. of Square D Co., Elmhurst, N. Y., on a bid of $3993.60.

For indicators (49-2439):
General Electric Co., Schenectady, on a bid of $8658.49.

For semi-steel valves (49-2487):
Crane Co., Dayton, on a bid of $24,163.60.

For 125 rudder assemblies (49-2495):
Broward Marine, Inc., Ft. Lauderdale, Florida, on a bid of $7964.

For chair, drafting (49-2305):
Companies sharing—McConnaughey Stationers Inc., Springfield, O., on a bid of $980, and B. K. Elliott Co., Cleveland, O., on a bid of $2293.20.

For stands (49-2286):
Companies sharing — Sherman-Manson Corp., St. Marys, O., on a bid of $1115; Charles Bruning Co., Inc., Chicago, on a bid of $2106, and McConnaughey Stationers, Inc., Springfield, O., on a bid of $10,680.

For post propeller assemblies (49-2037):
Companies sharing—Industrial Precision Products Co., Chicago, on a bid of $1305.60, and The Steel Products Engineering Co., Springfield, O., on a bid of $61,269.60.

Lightplane Operating Costs Studied

University of Illinois survey of its 32-plane fleet reveals wide range of cost for each type of craft.

What does it cost to operate a light airplane? Between $4.516 an hour and $12.01 an hour are the figures developed by Dr. Leslie Bryan of the University of Illinois, after a look at costs for the last 11 months of 1948 on the 32 lightplanes operated by the university's institute of aviation as a fleet.

Analysis of operating costs showed:

- Costs of 16 Aeronca 7AC Champion trainers (65 hp.) ranged from $4.516 to $6.657 an hour.
- Three Boeing A-75 (PT-13) trainers (220 hp.) showed costs of $12.01, $9.494 and $9.093 an hour respectively.
- Two Cessna 120s had costs of $4.975 and $4.697 while two Cessna 140s had costs of $5.187 and $5.277.
- Two Ercoupes, one new and one used, showed costs of $8.135 for the used plane and $8.95 for the new one.
- Three Beech Bonanzas, one Model 35, and two A-35s showed costs of $11.782, $8.364 and $9.563 respectively.
- Four other makes of plane, one each, showed following hourly costs: Republic Seabee amphibian, (used) $10.73; Stinson Voyager 150, $9.976; Piper Supercruiser, $5.277; Taylorcraft BC-65 (used) $5.279.

► **Depreciation Charges**—Cost margin between the planes is partly explained by the depreciation charge placed against each plane by the university.

Depreciation of $4 a flight hour was charged against the Bonanzas and the Boeings, $3 an hour against the Seabee and the Stinson, $2 an hour against the Ercoupes and Supercruiser, and $1 an hour against the Cessnas, Aeroncas, and Taylorcraft. The flight hour depreciation basis is especially useful, Dr. Bryan reports, in cases of greater-than-average annual aircraft utilization. The university's planes are flown more than twice the national annual average of hours utilization for light aircraft. (Depreciation rate on the two Beech A-35s has recently been increased to $5 a flight hour by the university due to increase in purchase price and installation of additional radio equipment in planes.)

The university acts as self-insurer of its aircraft except for property damage and public liability. Total expense of repairs to damaged aircraft allotted under this policy amounted to only 8 cents per flight hour, while 9 cents per flight hour was allowed for liability insurance.

► **Fixed Assessments**—Other fixed charges, the same for all planes, included:

- **Shop overhead maintenance** (including salaries of maintenance engineer, shop foreman, machinist, stock room clerk and secretary), and labor and material costs of repairing parts for future use, $1.14 an hour per plane;
- **Depreciation on shop equipment** (total depreciation in 10 yr.) 16 cents a flight hour per aircraft;
- **Linemen's salaries** (seven linemen who give one third of time to transient aircraft and two-thirds to university fleet) 54 cents a flight hour per aircraft

Fuel consumption averaged from 3.06 gal./hr. for the Taylorcraft costing 54.7 cents, to 17.1 gal./hr. for the Seabee, costing $2.977. A total of 16,598 hr. flown by the fleet consumed 75,888.1 gal of fuel at a cost of $14,295.43 and 4212 quarts of oil at $549.30.

Average direct maintenance cost per flight hour on airplanes of less than 100 hp. was $1.74. Total fleet maintenance cost was $14,739.21 for labor and $13,073.21 for materials. One Beech Bonanza A-35 which was flown 117.6 hr. showed a total maintenance charge of only 28 cents/hr., while the new Ercoupe, which was flown 255.3 hr. had the highest maintenance cost, $4.22 per hr.

Charges for material were at actual cost to the university and probably about 10 to 20 percent less than retail material prices, but Dr. Bryan estimates that this is probably balanced off by instructions to keep the equipment as good as new, and where possible, beyond CAA minimums. Only experienced aircraft and aircraft engine mechanics were employed with a ratio of one mechanic to four aircraft. Labor costs averaged approximately $1.31 per hr.

Fuel was 80-octane aviation gasoline, purchased by the university at bid prices with an average saving of several cents a gallon over retail. Standard operating procedure for the fleet called for use of decreased throttle on takeoff after breaking ground, and for a cruising speed 100 rpm. less than recommended by the engine manufacturer. Complete oil changes were made in each plane after 25 hours of flight with an average of about one quart added between changes.

Dr. Bryan points out that no validity for universal application is claimed for his figures, and that the university's own cost figures have changed since the study was made. He notes the exclusion of hangar rent as a cost item, which would be included under other circumstances. He also points out that the amount of flight time on some of the aircraft was so small that their costs were of questionable statistical value.

Value of the study is seen principally in its systematic totting up of the various cost factors and in the wide variety of aircraft types studied, offering some basis for comparison for a large segment of today's aircraft operators with their own operating costs.

Airport Builds Lightplane Runway

Van Nuys (Calif.) Municipal Airport is constructing a separate takeoff strip for lightplanes as part of the field's development by the Los Angeles Department of Airports.

Strip will be 2000 ft. long, 75 ft. wide, and parallel to the north end of the main runway. Airport manager Col. Clarence M. Young says the purpose of the new strip is to relieve congestion on the main runway during peak periods.

Cost of the new strip will amount to $8376.20, according to Young. Other projects at the field, in addition to landscaping, building repair and rehabilitation, include construction of a new air traffic control tower. Bids will soon be asked for this project.

Metropolitan Airport was taken over from War Assets Administration by the Dept. of Airports on Feb. 11, 1949.

N. Y. Airport Guide

Location of 260 public airports in New York State and details of facilities are included in a 1949 map and directory recently issued.

Map underscores the names of 251 communities already air-marked, and shows location of airports in relation to county lines, principal waterways, cities and villages of 1000 or more population and smaller air-marked communities.

Directory lists names of airport operators and managers, describes landing strips, fuel supply available, maintenance facilities and wave length of traffic control towers.

Copies of the map may be obtained free by writing New York State Department of Commerce, 112 State St., Albany 7, N. Y.

BRIEFING FOR DEALERS & DISTRIBUTORS

DUSTER PILOTS COURSE—Barrie Aeronautical Corp., at Lee Airport, Lockport, N. Y. has announced a controlled duster pilots course, for commercial pilots, believed to be the first state-approved course of its type in the country. Applicants will be required to pass a rigorous entrance examination before acceptance as students. Course will be over a six-weeks period including 100 hr. ground instruction in addition to 30 to 38 hr. specialized flight training. First in a series of courses will start about Sept. 1. Ground school curriculum will include such subjects as: Plant insect and disease preventive measures, dusting and spraying from aircraft, insecticides, fungicides, herbicides, seeding, hormone spraying, frost control, pollinating, and a study of obligations of operator to his customers and the public, reviewing latest legal decisions in this field.

PIPER APPOINTMENTS—Appointments of Jules Parmentier, head of Green Bay Airmotive, Austin Straubel Airport, Green Bay, Wis., and John Baker, new head of Martin Aircraft Sales at Long Beach, Calif., as distributors for Piper Aircraft Corp., have been announced. Both men were former district sales managers for Piper. Parmentier has been a fixed base operator at Green Bay since shortly after the end of World War II. Baker, former midwest Piper sales manager with Omaha headquarters, recently purchased the Martin operation in partnership with Al Gillis, Montana Piper-Stinson distributor. Harvey Martin, previous owner of the Martin organization, had been a Piper distributor since 1934. He plans to take a vacation. The operation will continue under the same name, as Piper-Stinson distributor for both California and Nevada.

AERIAL APPLICATORS—Indiana Aeronautics Commission has adopted a regulation requiring any person who engages in the "aerial application of chemical dust sprays, fertilizers and seeds" to register as an aerial applicator with the state commission. Deadline of July 18 was set for registrations, with provision for 30 days registration grace for persons engaged in such activities in Indiana before the effective date. Regulation is preliminary to a study by the aeronautics commission of the need, if any, for regulation of the "applicators." It provides that registrant shall submit evidence of holding a waiver or letter of authority from CAA approving his operation of aircraft in "applications."

CO-EDS AT BRAYTON—Beginning in September the Brayton Flying Service Aeronautical Training Division will accept women for training in all its departments, with no difference in training or standards of performance required. The school, at Lambert-St. Louis Airport, has already enrolled women in its various flight courses, ranging from private and commercial to multi-engine, and airline transport pilot ratings, and now will make available to women courses for aircraft and engine mechanics, base operators and maintenance, and the two-year aeronautical engineering curriculum. The Associated Brayton Flying Service at Cuero, Texas, which operated a World War II primary AAF cadet training school used women mechanics with the rating of army mechanic and found their work satisfactory.

ROCKY MOUNT FAIR—Recent aviation fair held at Rocky Mount (N. C.) Municipal Airport is cited as an example of a constructive demonstration of modern aviation uses, without the "chills, thrills and spills" typical air show routine. CAA and Coast and Geodetic Survey provided exhibits, L. P. Broadfield's Rocky Mount Air Service provided static aviation displays, and major emphasis was laid on agricultural services of aviation in dusting, spraying and seeding. Approximately 7500 persons attended the two-day show. Manufacturers participating in the show, with exhibits and demonstrations included Piper Aircraft, and three chemical and fertilizer manufacturers.

—ALEXANDER McSURELY

AIR TRANSPORT

U. S. Jet Liner Outlook Is Bleak

Brewster warns unless U. S. gets government prototype bill, carriers may end up buying British-made craft.

By Charles Adams

Deepening concern over foreign threats to U. S. leadership in air transportation is being manifested in both congressional and industry quarters.

First flight of the four-jet, 36-passenger de Havilland Comet, designed to cruise at 500 mph., jolted key legislators interested in aviation. Through the Comet and its turboprop transports —three already flying, with a fourth on the way—Britain hopes to forge to the top in commercial aviation.

▶**Brewster Asks Action**—Sen. Owen Brewster (R., Me.), who recently introduced a "perfected" bill authorizing a government prototype development program, told AVIATION WEEK the Comet demonstrates the extent to which U. S. development in the air transport field has lagged as a result of the inability of American aircraft manufacturers or airlines to finance new planes. He noted that the British are doing their commercial aircraft development "for government account."

"Failure of the British thus far in the development of new transport types for practical airline application is no guarantee that they will not ultimately succeed in a field where America has thus far been pre-eminent," Brewster continued. He recalled that both the President's Air Policy Commission and the congressional Aviation Policy Board were unanimous in recommending a government prototype development program as the only means of continuing American progress.

Brewster said there is a real possibility that if action is not taken soon, U.S. commercial airlines will be buying British planes. He added that many American aircraft manufacturers and airlines have indicated their concern about British developments to him.

▶**Turboprop Transports**—Besides the Comet, which Britain hopes will be able to fly from London to New York nonstop in six hours, the British have flown three airliners equipped with turboprops: Vickers-Armstrong Viscount, Armstrong Whitworth Apollo and Handley Page Mamba-Marathon. A fourth turboprop transport, the Handley Page Hermes V, is slated to make its first flight shortly.

Britain claims to be the only nation in which turboprop airliners have been built and flown. The U. S. has neither turboprop nor turbojet commercial transports under construction. Without government aid throughout prototype development funds, the American outlook in the jet airliner field is bleak.

▶**U. S. Leads**—At present, U. S. planes with reciprocating engines completely dominate the commercial airways. Last year, American-built planes accounted for 77 percent of the aircraft operated on the world's scheduled flights outside of Russia. British-built planes accounted for 15 percent of the commercial airline equipment.

On the blue-ribbon trans-Atlantic run between New York and Europe, all of the carriers—British, French, Dutch, Belgian, Swiss, Scandinavian and U. S. —now use American-built equipment exclusively. Constellations performed almost 70 percent of the foreign carriers' trans-Atlantic flights into and out of New York last year.

▶**Foreign Lines Gain**—But U. S. leadership over the North Atlantic is slipping even now. Whereas in 1947 U. S. flag lines carried 73 percent of all trans-Atlantic passengers into and out of New York, their share fell to 69 percent last year.

Pan American Airways president Juan Trippe warned recently that U. S. carriers flying the North Atlantic have been living in a "fool's paradise." He said that when Great Britain acquires sufficient modern equipment, including its 10 Boeing Stratocruisers, it will capture more trans-Atlantic business.

▶**ECA Criticized**—Meanwhile, Sen. James P. Kem (R., Mo.) charged that U. S. taxpayers are financing the development of nationalized foreign airlines that compete with American carriers. He noted that between Apr. 3, 1948, and May 31, 1949, ECA procurement authorizations for aircraft, parts and accessories totaled $49,700,000.

He said that aircraft financed with the assistance of ECA included six new Constellations, nine used DC-4s and a used Constellation for France; two new Constellations, six DC-6s and 12 Convair-Liners for the Netherlands; and six Convairs for Belgium.

▶**AOA Deal Cited**—Sen. Kem quoted American Airlines as saying one of the principal reasons it decided to dispose of American Overseas Airlines was because AOA would soon require additional capital which it would have difficulty obtaining. "At the same time, ECA is financing AOA's direct competitor,

COACH ADVERTISING FOR COACH SERVICE

Northwest stewardess Helene Spytek and Twin Cities Line motorman W. C. Beckham inspect NWA's latest bit of advertising for its transcontinental aircoach service. The signs, on streetcars in Minneapolis and St. Paul, are part of a plan by NWA to push advantages and low cost of aircoach travel.

the British government," according to Kem.

The Missouri senator declared that the Belgian airline, Sabena, had received six Marshall Plan Convair-Liners costing about $450,000 each. But, he added, "airlines running out of St. Louis, such as Chicago & Southern, apparently can't afford to replace their older equipment with Convairs."

Collision Ruins Best Safety Mark

The best safety record in the history of scheduled domestic air transportation snapped on July 30 when the industry suffered its first fatal accident in eleven months and close to six billion passenger-miles of flight.

Crash of an Eastern Air Lines DC-3 near Fort Dix, N. J., resulted in the death of 12 passengers and three crewmen aboard the transport. Last previous fatal mishap on the scheduled domestic airlines involved a Northwest Airlines Martin 2-0-2 which fell near Winona, Minn., Aug. 29, 1948, killing 37.

► **Records Compared**—The 11-month period was not the longest flown by the scheduled domestic carriers without a fatality.

There were no domestic passenger or crew deaths for the 17-month period between Mar. 27, 1939, and Aug. 31, 1940.

Even so, the recently-terminated 11-month record is the more significant since it covers nearly 6 billion passenger-miles—more than four times the 1,368,000,000 flown during the 1939-40 safety stretch.

Other safety achievements stood out at the end of last month despite the EAL crash. U. S. overseas flag lines had flown since Apr. 15, 1948, without a fatal mishap. Certificated feederlines had no fatal accidents since the first short-haul carrier was activated in August, 1945.

► **Navy Craft Blamed**—Preliminary reports indicated the Fort Dix crash was no fault of Eastern. The DC-3, southbound from New York, was struck by a Navy Hellcat fighter plane flying from Washington, D. C., to Quonset Point, R. I.

Witnesses said that after buzzing a Piper Cub the Navy pilot climbed sharply and struck the DC-3. The transport plunged to the ground, killing all aboard.

Another EAL plane and a National Airlines flight reported being buzzed by Navy aircraft over New Jersey about the same time. The Navy has established a special board of inquiry, and the Civil Aeronautics Board has begun its own investigation into the cause of the mishap.

How IATA Solves Airline Exchange

International airline cooperation pays off through this efficient handling of the carriers currency exchange.

Expediting millions of dollars in currency exchange between countries represented by its 55 members, the International Air Transport Assn. clearing house has become the indispensable brain trust for all financial transactions in international air transport.

► **Exchange Leaps**—IATA established the clearing house in 1947 in London. For the first month of 1947, currency turnover was $720,000. At this time there were only 18 airline members. In September, 1948, the clearing house handled the peak figure of $15,161,000.

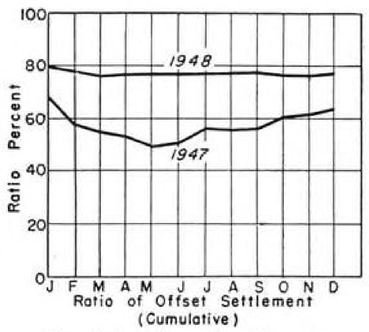
Total turnover for 1947, first year of operation, was $52,400,000. In 1948 the figure more than doubled to $124 million.

This year turnover is expected to top $145 million, and by 1952, according to estimates, it should be at least $265 million a year.

Before IATA established the clearing house, international airlines had to deal with each other in currency transactions. This was complicated by the many regulations and currency restrictions imposed by countries after the war. American carriers had an almost impossible task in recovering dollars in exchange for currency from countries with widely fluctuating values.

Now, members present their debts in their national currency to the clearing house, where the debts are translated into dollars or pounds, depending on whether the creditor is in a sterling or dollar area.

► **Economical Unsnarling**—After as much of the debt as possible is cleared by offset, the remainder is settled in cash. In 1947, clearance was more than four-fifths by offset. In 1948, the average was a little less. Sweden's ABA once had a $1.2 million turnover settled by 99.75 percent offset and only .25 percent cash. With no clearing house to handle the transaction, it would have



Cumulative offset ratio settlement.


Arthur Quin-Harkin heads clearing house.

cost the carrier $240 in exchange brokerage fees and involved the purchase and sale of about nine currencies.

► **Member Tolls**—Each member shares management charges in proportion to his use of the clearing house. These costs have been fixed in terms of ☆ percent of the debit and credit turnover, or ⅛ percent of the one-way turnover of the clearing house. Members are charged 5-6 cents for every $100 they put in the clearing house, but they are not charged on debits.

Cost of running the clearing house is estimated at $60,000 per year, including $10,000 for amortization of preliminary expenses.

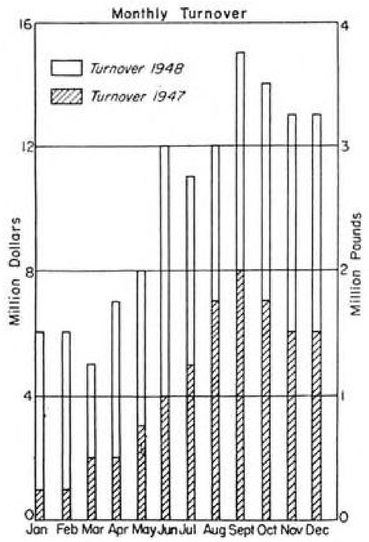
Running the clearing house is the job of busy Arthur Quin-Harkin, for many years chief accountant of Imperial Airways and later administration director of British Overseas Airways Corp. Initial headquarters was a single room in a bombed building in London's Portland Place. The staff consisted of Mr. Quin-Harkin, a typist and an elderly assistant. Now the office is completely staffed and is located at 30 Curzon St., Mayfair, London.

► **Cooperation Pays Off**—Quin-Harkin estimates airline members of the clearing house save themselves not less than $28,000 per year in exchange brokerage fees. Sometimes the saving is much greater. When the French franc was devalued in 1948, creditors to whom French francs were owed received the equivalent in sterling or dollars and suffered no loss. Debtors who owed francs paid sterling or dollars at the pre-change rate. A clearing house regulation provides that all accounts prior to devaluation shall be brought into clearance at the pre-devaluation rate of exchange.

In this case, 24 airlines were involved. The French airline, which had collected francs but was required to pay in other currencies, was saved $68,000 by offset. Airlines which had accumulated franc credits after the offset was made saved $64,000 by being able to convert into dollars or pounds at the old rate. The saving to members was more than three times the annual cost of operating the clearing house.

Currently, time elapsed before settlement is 41 days, but 30 of these days are consumed by the airlines in sending in accounts. One airline has shown such confidence in the clearing house that it has authorized its London office to settle whatever the clearing house demands, long before documents are received by the home office.

U. S., Scandinavian and British airlines each account for about 20 percent of the total turnover of the clearing house. KLM, Swissair and Sabena together account for about 30 percent, leaving 10 percent for the others.



Monthly turnover in dollars and pounds.

NWA Cargo Loads

Cargo loads carried by Northwest Airlines from Seattle and Portland to Honolulu have shown an increase each month since the Hawaii longshore strike started. In June Northwest carried 12 times as much as the pre-strike normal.

The April increase over March amounted to 131 percent; May over April, 66 percent; and June over May, 225 percent. Cargoes consist chiefly of fresh eggs, butter, fruits, and vegetables. Cargo lists also included drugs, printed matter, radios, automobile and machine parts, flowers and general merchandise.

Central Plans Cessna 195 Service

One-engine feederline costs estimated at 31 cents per plane-mile. See 75 percent loads on tri-state route.

Economic feasibility of using single-engine planes for feeder operations is being championed vigorously by Central Airlines, Oklahoma City, which hopes to put its theories into practice this summer.

Unable to raise sufficient money to activate its short-haul system with large, multi-engine transports, Central began rushing planes to open service with lightplanes when the Civil Aeronautics Board recently flashed the green light for such operations. The company intends to start scheduled flights over two of its certificated route segments in Oklahoma, northern Texas and southern Kansas by the end of August.

CAB late last month approved interlocking directorates and changes in Central's control, thereby permitting the carrier to complete final arrangements for getting under way.

► **Move is Experiment**—Although CAB has promulgated new rules enabling feeders to use single-engine equipment for short-haul services in areas where the topography is favorable, the Federal agency definitely regards the move as an experiment. If the lightplane service proves unacceptable to the public and does not meet the needs of the Post Office it can be terminated without large loss because of the comparatively low costs involved.

Keith Kahle, Central's vice president and general manager, has disclosed a tentative plan for operating his 1335-mile system with Cessna 195s, although the company is still considering acquisition of Beech Bonanzas or Ryan Navions.

► **Costs Estimated**—Central figures the Cessna 195, fully loaded, will carry a maximum of four passengers, a pilot and 200 lb. of baggage and mail. Costing about $16,700, the plane will cruise at 146 mph.

Operating cost is estimated at 31 cents a plane-mile, including direct flying costs of roughly 15 cents a mile. This is based on operation of two round-trips daily over Central's five route segments and assumes an annual completion factor of 80 percent of all schedules.

The Bonanza and Navion could be operated at a direct cost of 5 or 6 cents a mile less than the Cessna 195. But they would only carry three passengers, the pilot and 80 to 90 lb. of baggage.

► **5-Cent Fare**—CAL expects to generate a 75 percent load factor with the Cessnas at a probable fare of 5 cents a mile. This would result in a mail pay break-even requirement of about 16 cents a plane-mile.

Cost to the government would be $253,000 annually on the basis of 1,584,048 miles flown. Total estimated capital investment required is $223,213, including $167,000 for 10 planes.

Central said that if CAA will permit night operations with single-engine equipment and allow major overhauls at 600- to 800-hr. intervals; and if local ticket agents can be obtained at the proposed salary of $50 monthly plus 10 percent commission on ticket sales, the total operating cost could go as low as 24 cents a plane-mile. On the other hand, if these conditions do not materialize, costs could go as high as 38 or 40 cents a plane-mile.

► **Fixed Base Help**—CAB officials note that while the use of local fixed base operators as combination ticket agents, teletype operators and passenger expeditors may be less expensive, a conflict of interest between such agents and the airline is likely to exist because of the charter aspirations of the local operators. Kahle replied that the arrangement is practicable because the fixed base operators believe that they can get considerable charter business to off-line points from Central's passengers.

Central asserts there will be no lack of public acceptance of the single-engine airplane in scheduled transportation over the area in question. It claims that the numerous charter flights by fixed base operators at airports along the certificated feeder system have already indoctrinated substantial numbers of the traveling public with the convenience and safety of the lightplane.

► **Lightplane Advantages**—One advantage for the lightplane is the fact that adequate maintenance facilities are to be found at most of the airports along the route, where the fixed base operators are thoroughly familiar with the equipment to be operated.

Another advantage for the single-engine plane, according to Kahle, is its high resale value as compared to the DC-3. He estimated that if CAB decides not to extend Central's certificate beyond the May, 1950, expiration date, the Cessnas could be disposed of for around $15,500 each, or only $1,200 below cost. Thus depreciation expenses would be small.

► **Extra Sections Considered**—Average feeder passenger load during 1948 was 5.31 per mile. If Central approaches this average it will have to operate frequent extra sections to accommodate the demand.

The company will keep two planes in reserve for this purpose. It figures that

even if extra sections are required so much as to double direct flying costs, the average feederline passenger load of 5.31 per mile could be handled in single-engine equipment at a total operating cost of 46 cents a plane-mile.

By comparison, DC-3 operating costs of Pioneer Air Lines and Trans-Texas Airways were 76.8 cents and 77.1 cents a plane-mile respectively last year. Florida Airways' operating costs for its 10-place Beech D-18Cs totaled 80.4 cents a plane-mile in 1948.

▶ **Mail Use Questioned**—The Post Office expressed doubt that the Cessna, fully loaded, had sufficient mail-carrying space.

CAB observed, however, that the average feederline mail load early this year was only 46 lb. Kahle said that once business concerns become acquainted with Central's schedules they will post their mail earlier to meet them—as was the case with All American Airways' pickup routes.

Rates Meeting

No immediate action on airport rates to airlines was forthcoming last week out of a Washington conference called by Del Rentzel, CAA administrator. The group invited included B. M. Doolin, San Francisco airports director; Louis R. Inwood, Kansas City aviation director; J. Victor Dallin, Philadelphia Bureau of Aeronautics chief; Jack Berry, Cleveland airports commissioner; Austin J. Tobin, Port of N. Y. Authority; Donald Connolly, Baltimore aviation director, and J. F. McManamon, Massachusetts director of aviation. Airline presidents who attended or sent representatives included Ralph Damon, TWA; C. R. Smith, American; Capt. Eddie V. Rickenbacker, Eastern, and J. H. Carmichael, Capitol. Subsequent meetings are expected to be held for further discussion of charges by airports to airlines, with indications that additional charges will be agreed upon.

Convairs Ordered Into Small Fields

Communities which have been designated as certificated airline stops are entitled to service whether or not their airfields can handle new and faster equipment such as the Convair-Liner, the Civil Aeronautics Board ruled recently.

The opinion was expressed in CAB orders denying American Airlines permission to suspend service at Abilene, Tex., and Jackson, Mich. AA contended that it would be unsafe to operate Convair-Liners regularly into these points under present airport conditions.

▶ **Convairs Replace DC-3s**—American suspended service at Abilene on Apr. 1, when Convairs were substituted for DC-3s in the area. On May 10, CAB rejected AA's petition for continued service suspension at the Texas city, and the Board has now refused to reconsider its decision.

American made landing and takeoff tests with a Convair at Abilene after CAB's first refusal to authorize the service suspension. The company said that the Convair employed in the demonstration on several occasions used up almost all of the runway against strong winds.

▶ **CAA Disagrees**—But Civil Aeronautics Administration representatives aboard the plane reiterated their previous contention that Convairs could be operated safely into and out of Abilene Municipal Airport No. 2 subject to certain load restrictions. CAA and CAB officials also disagreed with American's contention that Reynolds Field at Jackson is not safe for Convairs.

Even if the Abilene Airport isn't suitable for Convair operations, American lacks sufficient grounds to suspend service, CAB emphasized. "The airport (and the one at Jackson) is suitable for safe operations with other types of aircraft. There is nothing in American's certificate or in Board regulations to prevent the carrier from using planes other than Convairs."

▶ **No DC-3s Left**—CAB's orders regarding Abilene and Jackson do not necessarily mean that American will have to round up some of its old DC-3 workhorses, last of which it retired to pasture with ceremonies several months ago.

American has an application pending to suspend service at Abilene on economic grounds. Moreover, the community has an abandoned military airport which could handle Convairs.

Jackson has considered lengthening its runways to accommodate Convairs. The city may now decide it does not need to go ahead with the project since CAB has put the responsibility of providing service squarely on American.

LAA Checks Copters For Overloads

Los Angeles Airways has taken steps to prevent recurrence of the accident last Jan. 21 in which the pilot of a Sikorsky S-51 helicopter was killed while attempting to take off from the roof of the Post Office Terminal Annex Building in downtown Los Angeles.

The Civil Aeronautics Board has confirmed earlier reports (AVIATION WEEK, Mar. 14) that the mishap was probably caused by improper loading of the mail-carrying craft with respect to the center of gravity. LAA now employs an inspector on the Post Office roof to assist pilots in loading properly.

▶ **New Takeoff Procedure**—In addition, all flights leaving the roof "weigh off", lifting vertically a few feet, then settling back down on the landing area. Takeoff power is then reapplied, and altitude gained in a normal manner.

Just prior to last January's accident, Post Office employes apparently loaded 34 mail pouches weighing 750 lb. aboard the S-51. The pilot's flight report indicated that 603 lb. of mail were placed in the forward compartment and 147 lb. in the aft compartment—a proper load distribution with respect to the center of gravity.

▶ **Craft Hits Roof**—But as the ship took off and approached the edge of the roof it assumed an abnormal nose-down attitude and turned in a steep bank to the right. During this maneuver, the main rotor blades struck the roof and a three-foot parapet. The Sikorsky then fell 62 ft. to the street below.

CAB investigators found that instead of 34 mail pouches weighing 750 lb., the craft was loaded with 43 pouches weighing 994 lb. The extra nine pouches, weighing 244 lb., had just been delivered to the Post Office roof by the helicopter and were inadvertently reloaded in the forward compartment with the outgoing mail.

Thus the forward compartment had 847 lb. of mail—considerably more than the 618 lb. maximum allowable if the center of gravity was to be kept within approved limits.

2-O-2 Outlook

Glenn L. Martin Company took an inventory loss of $12 million to $16 million on airline cancellations of Martin 2-O-2 transports, a Reconstruction Finance Corp. spokesman said last week, in analyzing the Baltimore aircraft manufacturer's financial problems. The RFC representative, Harvey J. Gunderson, who is handling loans to Martin, said the RFC debt stood at $16,400,000 on Jan. 1, but was reduced to $11,900,000 as of June 30. He predicted the 2-O-2 transport "will prove itself the biggest money maker of them all" in six months.

Continues Profit

Alaska Airlines, which switched from red to black ink during the 1948 fiscal year, is continuing to operate with a profit.

For the first eight months of the 1949 fiscal year (through June 30), the company showed a net profit of $230,000, or 38 cents a share. Board Chairman R. W. Marshall expects the next four months of this fiscal year to be even more successful.

He said the carrier has received $750,000 in additional mail pay, retroactive to Dec. 31, 1946, enabling it to retire a $232,000 Reconstruction Finance Corp. loan. About $1.5 million in additional mail pay claims are still pending before the Civil Aeronautics Board.

Boeing School Shut

The Boeing Airplane Co. has closed its Stratocruiser training school at Seattle, Wash., after training 677 students from six airlines, as well as 38 CAA and British Air Regulation Board officials. The training equipment, valued at $200,000, is being kept intact for possible future use.

Four of the Boeing instructors have been sent to England, where they are helping BOAC set up a similar school to train additional airline personnel in Stratocruiser maintenance.

Air Travel Safer

It was safer to travel on U. S. scheduled airlines last year than to ride in a private automobile or in a taxicab.

The National Safety Council reports that the death rate per 100 million passenger miles was 2.1 for autos and taxis during 1948, compared with 1.3 on the scheduled airlines. Railroads had a death rate last year of only 0.13 per 100 million passenger miles. Buses were second with a rate of 0.18.

LETTERS

Resort Graduates

I am sure that inclusion of Resort Airlines in your article under "Air Transport," July 11, was just one of those peculiar things that happens to be entirely true, but leaves unsaid the reasons therefor. Strangely enough, we have had considerable adverse reaction from the public and certain stockholders of the Company. When you say the 46 uncertificated carriers had their letters of registration withdrawn and lost their operating authority, and include Resort Airlines, the inference is very unfortunate.

Just to set the record straight, we would greatly appreciate it if you would publish a short clarification to the effect that Resort Airlines graduated from the nonsked field to the ranks of the certificated airlines. Obviously it could not be both, and therefore Resort did not request a new letter of registration.

L. C. Burwell, Jr., President,
Resort Airlines Inc.,
367 Lexington Ave.,
New York, N. Y.

(Resort Airlines was, indeed, the only "graduate" among the 46 uncertificated carriers which recently lost their authority to operate nonscheduled flights with transport-type equipment. As reported in Aviation Week, June 20, the Civil Aeronautics Board on June 10 complied with President Truman's instructions and awarded Resort a five-year certificate to conduct all-expense tours from U. S. points to Mexico, the Caribbean areas, South America and Canada. Still pending before CAB is Resort's request to operate vacation tours over domestic routes.—Ed.)

Learn From Nonskeds

Please allow this letter to congratulate you on your excellent editorial, "Air Transport Should Grow Up," June 27, Aviation Week . . .

We of AAXICO concur in your thinking that ATA can learn considerable from the nonskeds in economical, safe operation . . . The aviation industry must take advantage of every lesson learned, regardless of whether that lesson is one contributed from without the scheduled airline group.

Howard J. Korth, President & General Manager
American Air Export & Import Company
Miami Springs, Florida

Crash Fires

You and Commander Bennett are to be congratulated upon his excellent article, "How to Cut Crash-Fire Dangers," in Aviation Week, June 20. It is a most constructive contribution.

Allen R. Ferguson
Assistant Professor of Economics
University of Virginia
Richmond, Virginia

Air Marking

Your editorial on air marking July 18 gives a pessimistic picture. . . . We feel this is not being fair to our state. Last year we constructed 320 new markers and this year our contractor is in the field working on a project that will result in approximately 400 more new markers, plus the re-painting of 40 old markers.

There are approximately 750 populated areas that can be marked in this state, so you can see that upon completion of our 1949 project just about every locality will be air marked. Not being blessed with an elaborate navigational aid system, we have to rely almost entirely on air markers.

F. E. Wolf, Operations Consultant
Aeronautics Commission
State of Wisconsin
Madison 3, Wis.

From Tony Le Vier

The usually reliable Aviation Week ventured pretty far off the beam in an item, "Test Pilot's Bonus," printed on Page 7, June 13. This erroneous article has been a source of acute embarrassment to me and to Herman Salmon, and I should like to take this opportunity to correct you.

I don't believe that Lockheed would consider, under any circumstances, a proposition such as you described and I can assure you that neither Salmon nor I would ever take advantage of a damn fine company in the way you suggested. The inference that Salmon and I occupy a special position among employes of Lockheed is particularly inappropriate and completely erroneous. . . . I enjoy reading Aviation Week and regret this incident. I trust you will understand the spirit of this correction. . . .

Tony Le Vier
Lockheed Aircraft Corp.
Burbank, Calif.

(Upon receipt of this letter, Aviation Week checked back with our original sources who indicated our item was correct. In the light of Mr. Le Vier's denial, however, we prefer to drop the matter and are sorry the item was embarrassing—Ed.)

SHORTLINES

▶ **All American**—Has inaugurated service on the Buffalo-Pittsburgh link, last of its seven feeder route segments. . . . CAB has been asked to extend AAA's Washington-Atlantic City route to New York City. . . . Company flew 8000 passengers in June and expected to book 11,000 to 12,000 in July.

▶ **American**—Flew 2,422,028 freight ton-miles in June, up 28 percent over the same month last year. June mail volume was down 3.4 percent from last year, and express traffic dipped 7.5 percent.

▶ **Eastern**—Reports a net profit of $2,148,361, or 90 cents a share, during the first six months of 1949, compared

with $1,321,065, or 55 cents a share, in the same period last year.

► **Mid-Continent**—Earned $57,837 net profit in June, compared with $35,612 net profit in the same month last year. Net profit for the first half of 1949 was $148,400 against $32,171 in the like 1948 period. Operating revenues gained 10 percent over the first six months of last year, and expenses were up 5 percent.

► **National**—Plans to adopt the first-of-the-week family fare plan on Sept. 4. The plan permits the head of a family, who pays full fare, to buy half-fare tickets for other members of his family when traveling on Mondays, Tuesdays and Wednesdays.

► **Northeast**—Reports traffic was at its highest peak in three years during June and early July.

► **Northwest**—President Croil Hunter states that after two years of operation NWA's Martin 2-O-2s are furnishing a ton-mile of transportation, before depreciation, for 24 percent less than the DC-3s they replaced.

► **Southern Airways**—Planned to inaugurate service on its Atlanta-Charlotte, N. C., feeder link last week.

► **United**—Has sold a DC-4 to the Salem Engineering Co., Salem, O., which will use the plane for a four-month globe-circling business trip.

Willis Air Service—Has negotiated an interline cargo agreement with Pan American Airways under which Willis will render east coast connecting service for PAA between Boston, New York and Miami and intermediate eastern seaboard points.

CAB SCHEDULE

Aug. 8—Hearing on Carco Air Service's lightplane route application. (Docket 3629)

Aug. 12—Resumption of hearings in Pioneer Air Lines' certificate renewal case. (Docket 3719 et al)

Aug. 15—Hearing on Hughes Tool Co. control of TWA. (Docket 2796)

Aug. 15—Hearing on Trans-Canada Air Lines' application for foreign air carrier permit to operate from Montreal and New York. (Docket 3964)

Aug. 16—Hearing on New York-Toronto nonstop service applications of American Airlines and Colonial Airlines. (Dockets 3853 and 3872)

Aug. 22—Hearing on extension of Expreso Aero InterAmericano's Havana-Miami foreign air carrier permit. (Docket 3717)

Sept. 6—Hearing on service to Lake Tahoe. (Docket 3623)

Sept. 12—Hearing on CAB investigation of International Air Transport Association agency resolutions. (Docket 3350)

Sept. 19—Hearing in air freight tariff agreement case. (Docket 2719 et al)

Sept. 26—Hearing on Seaboard & Western and Transocean Air Lines applications for all-cargo certificates between the U. S., Europe and the Middle East. (Dockets 3401 and 3818)

Sept. 26—Hearing on disposal of Parks Air Lines' routes. (Docket 3965 et al)

Nov. 14—Hearing in Western-Inland mail rate case. (Docket 2870)

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R1340-AN-1 . 2,250- 1,750 exchange	R1340's 700.00
R985-AN-1 or 3 1,650- 1,450 exchange	R985's 600.00
R985-14B . . . 2,050- 1,850 exchange	R2800 B's 1,400.00
R2800-51 or 75 2,100- 1,950 exchange	*The above prices are all Plus Parts*
R-1830-65-92. 1,850 Conv. Less Carb.	

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All work and engine sales carry our 100 hr. warranty

Discounts on Quantity Purchases of Five or More Engines

The management and Key Men of A. C. E. S. are all former Pratt & Whitney Aircraft Supervisors and have the benefit of over 75 years accumulated experience. We have complete facilities for overhaul, Block Test, Installation and handle all accessories pertaining to the engines. We have been engaged in the Overhaul & Sale of engines here for the past four years.

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GRUMMAN GOOSE G-21A
40 Min. flying time since major overhaul on airframe engines & instruments by CAA approved repair station

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24 passenger roomy deluxe cabin interior reclining seats. Fastest amphibian of its size built to date. Full airline radio equipment. Fresh license date of sale.

DOUGLAS DC-3-S1C3G
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Lowest time C-47 available in the country—bucket seats.

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Model 35, Serial No. D-1287. Purchased new February 1948. 550 hours on aircraft and engine. 500 hour check and Beech factory representative check just completed. Always hangared. Flown by one pilot only for company transportation.
Extra Equipment: Directional gyro and horizon with suction gauge, remote indicating compass, accelerometer, NARCO VHF transmitter and tunable receiver. Up-to date Jeppesen manuals included with revisions service to March 1950.

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Converted to Executive Airplane. A-1 condition with new zero time engines, airline radio and instruments and 8 place attractive cabin interior. Spare engines, miscellaneous accessories, cowling and spare parts included in sale price. NL licensed. Priced for quick sale.
Brokers Protected.

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420 hrs. since major overhaul on motors
Propellers full feathering
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Ship just relicensed
Perfect Condition
2 Extra O-time overhauled motors included.

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We're glad to say that more heads are Nodding now...

When this company first talked of a 100-engine hour warranty on converted surplus engines, tongues cautioned, and experienced suppliers shook their heads. They said that operators would abuse our engines, content that if they failed Steward-Davis was committed to replace them. We thought differently.

True, our warranty seemed ambitious in comparison to the usual guarantee of "workmanship and materials." And obviously, too much abuse of it could force us to withdraw our published guarantees under a cloud of suspicion which would be destructive to our reputation. However, we decided to count upon the belief that most operators knew too well the cost of canceled schedules and unnecessary engine changes to misuse an engine, regardless of any warranty. We also believed that most operators were ready to admit that each engine failure must be judged on its own merits before the responsibility for it could be laid at the door of the overhaul agency. Lastly we decided that operators everywhere would respect a frank acceptance of responsibility in a surplus market when most merchandise was being sold without recourse. Today, after dealing with airlines throughout the world for over two years, and seeing each of our few engine difficulties brought to an amicable conclusion with our customers, we are of the opinion that we are receiving the co-operation which we must have after our engines leave our shops. And through such co-operation we are now enabled to accept an increased responsibility for the performance of our product.

Therefore every Steward-Davis R-1830-92 Commercial Overhaul sold to an airline observing U. S. Civilian Aeronautics Administration operations and maintenance standards is now subject to up to six hundred hours of warranted operation. *Further information about this increased warranty will be furnished upon request.*

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EDITORIAL

Safety Regulations: Scheduled Vs. Nonscheduled

(Adm. Emory S. Land, President of the Air Transport Assn., recently prepared for AVIATION WEEK *a "Statement of Major Differences in Safety Regulations Applying to the Scheduled (Certificated) Air Carriers as Compared with the Non-scheduled and Contract Operators." Before publishing the statement, which appears below in complete form, we forwarded copies to executives of several non-scheduled carriers. The only reply received up to the time these words were being written came from Paul Andrews, spokesman for Air America. His comments are printed with Adm. Land's.* AVIATION WEEK *hopes in this way to help clarify some of the issues involved in the controversy and name-calling of these two groups of air carriers.—R. H. W.)*

Route and Airport Requirements

ATA Comment: The certificated airlines must make careful surveys of a new route before operating it; the irregular and contract operators do not. Each airport a certificated carrier uses must be individually examined and approved by CAA inspectors. This is not true of the nonscheduled and contract operators. Each certificated airline must have its own radio communications network. The irregular and contract operators need not meet this requirement. Weather reporting services must be available over the route of a certificated operator. This is not the case with the nonscheduled or contract operator. It might be urged that some of these requirements cannot be imposed upon an operator who does not operate over a particular route regularly. Many of the operators, however, do operate regularly over particular routes, and for them there is no justification for avoiding these requirements. For those irregular and contract operators who actually do conduct an irregular operation, their presumed unfamiliarity with their routes and airports, their lack of communication systems, and the like, should require additional regulations designed to compensate for these lower standards, such as higher takeoff and landing weather minimums at the airports they do use.

Air America Answer: Every carrier, scheduled or not, must confine his operations to airports suited to landing and takeoff specifications prescribed for each type of plane in use. Individual examination of all airports which might be used in irregular operations (and in the charter or group movements of certificated carriers) would require a route study of every airport in America licensed for DC-4 and C-46 operations. The scheduled airlines frequently make "off-line" landings at airports which they have never inspected.

In the second instance, Air America and presumably other nonscheduled carriers would welcome the opportunity to maintain company communications channels. But the Federal Communications Commission cannot and will not authorize individual radio frequencies for non-certificated air carriers. In the matter of weather facilities, it is axiomatic that all nonskeds use the government's reporting facilities which are available at every point along the federal airways. When off the airways, regulars and irregulars alike must operate according to the same VFR minimums. It is interesting to note that several airlines have recently suggested that the U. S. Weather Bureau acquire airline-owned facilities—which may indicate that the cost of these individual forecasting facilities have outweighed the advantages and need.

Takeoff and Landing Minimums

ATA: Scheduled airline planes are prohibited from taking off unless certain minimum ceilings and visibilities exist. These are generally prescribed as a 300-ft. ceiling and visibility of one mile. The irregular air carriers are similarily limited as to takeoff minimums. A contract carrier, however, is not so restricted. It is up to the captain of a contract carrier aircraft to determine whether the weather conditions are sufficiently good for takeoff. It is probable that the aircraft which crashed at Seattle purported to be engaged in a contract operation.

Air America: This statement typifies the ATA attempt to malign large irregular carriers by inference rather than direct statement. Here, Jerry Land admits that skeds and nonskeds observe identical landing and takeoff regulations. Then he interjects "contract carriers" into the discussion, implying that such operations are synonymous with the $99 aircoach operations which precipitated his present safety thesis. Quite honestly, the large irregular carriers will welcome the day when contract and common carriers meet identical regulations—because that day will remove a convenient "hook" upon which the ATA hangs most of its arguments against all irregular air carriers.

Pilot Qualification Differences

ATA: A captain of the scheduled airline aircraft must have an airline transport pilot certificate and must have proven to a government or airline check pilot his ability to handle the model of airplane in which he carries passengers. The captain of an irregular air carrier plane does not need to hold this highest category of pilot certificate. He need hold only a commercial pilot's certificate with an instrument rating and have a minimum of 1200 hours of flight time. He is not required to demonstrate familiarity with the model airplane in which he carries passengers. The scheduled airline captain is limited to operating aircraft within the horse-

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AVIATION WEEK
AUGUST 8, 1949

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SEARCHLIGHT SECTION
(Classified Advertising)

EDITORIAL

(*Continued from page 48*)

power range for which he is rated. Quite to the contrary, a commercial pilot, who takes his flight check in a twin-engine airplane of low horsepower may carry passengers in an airplane the size of a Constellation or Douglas DC-6 without having been checked by a CAA inspector in an airplane of that size.

A contract carrier pilot may carry passengers if he holds a commercial pilot certificate (200 hours of flight time required) and holds an instrument rating. He need not be familiar with the aircraft model he operates.

The scheduled airline is required to provide a training program for its pilots, in order to maintain a high standard of pilot technique. This training program is particularly addressed to training in one-engine-out operations and in instrument approach procedures. The nonscheduled operator is not required to establish such a training program. Each airline is required to provide enough check pilots to make certain that each pilot employed by the company meets the pilot requirements and receives the training and check flying required. Nonscheduled carriers are not required to employ check pilots.

Air America: Since June, the CAA has required that an irregular airline pilot (1) hold a current Air Transport Rating; (2) receive instrument competency check at intervals of six months, and (3) take his competency checks in the type of aircraft operated by his employing carrier. Upon successful fulfillment of these tests, the irregular skipper is granted a "type" ATR, designating DC-3, DC-4, C-46, DC-6 or Constellation competence. He can fly only that type for which he has been currently licensed. Furthermore, the regulations provide that each irregular carrier "shall by means of a training program or otherwise insure that crew members are proficient in their duties and are kept currently informed of all technology and new developments pertinent thereto. The program shall include instruction in emergency procedures and in crew co-ordination." In the case of Air America, these required techniques have long been basic company musts. Air America sets an ATR with 5000 hours as a minimum for captains and also requires that all copilots hold an ATR with 2500 hours. How many ATA members outreach this latter "minimum"?

Aircraft Maintenance

ATA: The certificated airlines are required by regulation to have a maintenance organization responsible for the continued airworthiness of their aircraft. All maintenance must be supervised by qualified mechanics; an adequate inspection organization must be maintained; a large quantity of spare parts must be available at all times; and a retirement-of-parts program must be followed. The certificated airlines are required to maintain a staff of ground personnel adequate for safe operation and a training program for such personnel. The irregular and contract carriers are not required to have any ground personnel or to meet any of these other regulations. They are subject only to the general requirement that their airplanes be airworthy.

Air America: Common carriers, whether scheduled or not, are subject to identical maintenance requirements specifying preflight, 25-, 50-, and 100-hour inspections plus 1000-hour engine overhaul and 8000-hour airframe overhaul. All carriers must maintain adequate records to demonstrate that all work specified in CAA-approved maintenance manuals has been performed. Moreover, all such work must be performed by a CAA-approved maintenance station. If Air America and other nonskeds have found profit in $99 fares, it is only because ground personnel who roll out red carpets or broil T-bone steaks —persons who are not required by any Civil Air Regulations—have been eliminated along with a number of vice presidents. Moreover, all maintenance for Air America is performed by the Oakland firm which (1) received Air Transport Magazine's award for superior maintenance two years running and (2) which has fulfilled maintenance contracts with the second largest scheduled airline in America.

Aircraft Dispatchers

ATA: No scheduled airline aircraft may depart without the approval of a dispatcher certificated by CAA. They assist the pilots in drawing up the flight plans, supervise the loading of the aircraft, and continually supply information to the pilots in the air. The irregular and contract operator is not required to maintain a dispatching organization.

Air America: Here, again, the contract carrier confuses the issue. Actually, Adm. Land is absolutely correct in stating that nonskeds are not required to maintain dispatchers. In practice, however, large irregulars involve two or more licensed airmen in the preparation of every flight plan, assign the copilot to pre-flight supervision of loading as determined by loading slip-sticks furnished by the airframe manufacturers, and relay in-flight instructions whenever possible via teletype communication with fixed base operators who furnish ground services on the nonsked flight from California to New York. Air America has asked the local Air Line Dispatchers Assn., an AFL union, to furnish us with dispatchers at each normal station. The answer: Not interested because a maximum of 12 flights a month through five cities hardly justifies the union's intervention.

Other Differences

ATA: There are many other differences between the detailed safety regulations prescribed for the scheduled airlines and the much less restrictive standards with which the irregular and contract operators must comply. Only the outstanding differences have been noted here.

speed →

safety →

economy →

ruggedness →

comfort →

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Speed! With a top speed at sea level of 184 miles per hour (performance figures guaranteed), at 8,000 feet the Beechcraft Bonanza cruises at 170 mph using only 56% of engine's maximum rated take-off power. *No engine overload*, so you get extra speed with an extra margin of safety.

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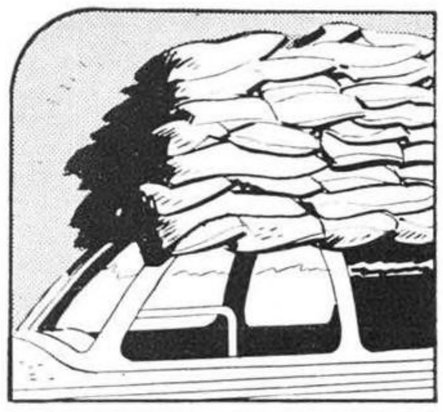
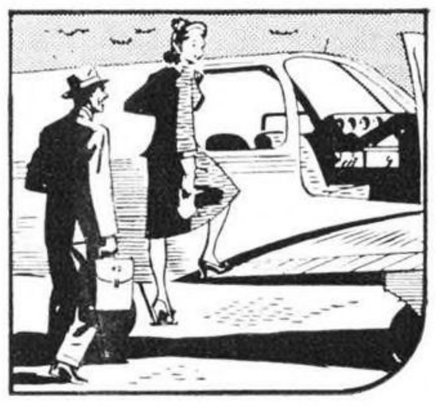


Ruggedness! Just for example, check the low and sturdy landing gear, with its wide tread and long wheel base, and struts exclusively cross-braced. Nose gear position plus long wheel base eliminate pitching, allow greater braking without excessive nose wheel load.

Economy! This Beechcraft has a fuel consumption of only 9½ gallons per hour at cruising speed. It carries four people and more than 135 pounds of baggage at a seat-mile cost of as low as 1¼ cents. You get the *extra speed* you want plus this important *extra economy*.



Comfort! The unique retractable step preserves feminine dignity. The wide sedan-type door and folding front seat help make getting in and out of this Beechcraft as easy as the family car. Plenty of room to stretch out; cabin really sound-proofed.

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Compare these performance features	Compare these comfort features
Top speed, 184 mph	Exclusive retractable step
Cruising speed, 170 mph	Limousine entrance
Range, 750 miles	Insulated, sound-proofed cabin
Service Ceiling 17,100 feet	Quickly removable rear seat
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Beechcraft

BONANZA MODEL A35

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