AVIATION WEEK

A McGRAW-HILL PUBLICATION

NOV. 16, 1953

50 CENTS

How to make your shots count

A lot of work has been done by a lot of people to increase aircraft stability. And now, from Honeywell, there comes a device that greatly advances the cause of the more stable flying gun platform, so important to accurate rocket and gun firing.

This device is called a Turn Coordinating Yaw Damper. It is now in production and is currently being installed in the AVRO CF-100. That's the all-Canadian fighter, pictured above, guarding the northern approaches to our continent.

The new Turn Coordinating Yaw Damper is a significant advance over earlier Yaw Dampers. With it a pilot can fly with his feet off the rudder pedals. No matter how he moves the stick, the turn—whether transient or steady—will always be coordinated. He is relieved of his concern over yaw, and has more positive assurance that his shots will count.

On the CF-100 the Turn Coordinating Yaw Damper is made to function as the rudder axis for the Honeywell MH-11 Autopilot, with which the CF-100 is also equipped.

The important improvement in performance made possible by the Turn Coordinating Yaw Damper serves to demonstrate how *automatic control* is such an important part of aviation progress. And *automatic control* is Honeywell's business.

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LOCKHEED ENGINEERS were looking for a way to seal the gap between elevator and stabilizer on the P2V-5 "Neptune" for smoother operation of controls. A flap seal—long strip of coated fabric—would do the trick. But an ordinary flap seal poses a maintenance problem. Every time an elevator is taken off for service, the flap seal must be removed too. And with ordinary flap seals, that's a long, costly job.

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Aviation Week

Volume 59 November 16, 1953 Number 20

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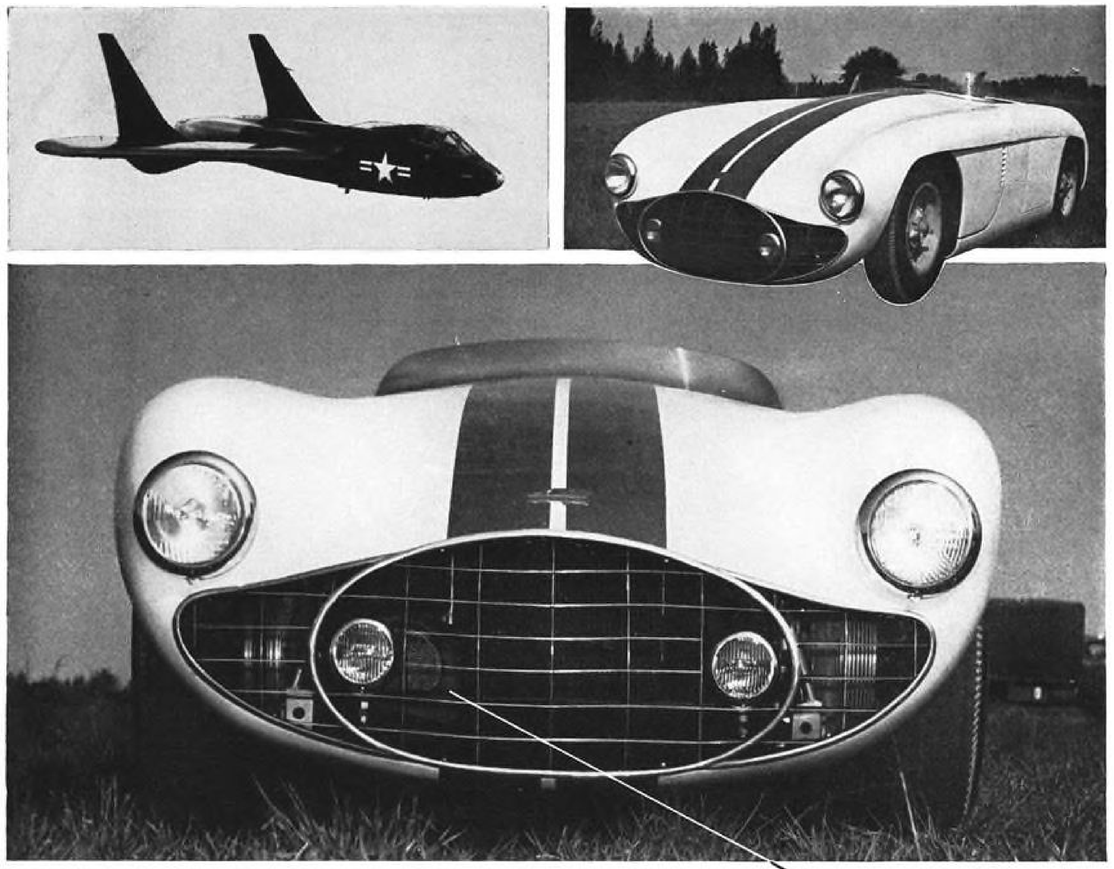

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NEWS DIGEST

Domestic

Government-owned missile plant operated by Hughes Aircraft at Tucson, Ariz., will not be taken over by the Air Force, industry observers forecast last week, despite reports that such a move is under consideration because of HAC's recent management troubles (AVIATION WEEK Oct. 15, p. 15). They say the Tucson plant depends heavily on Hughes research and development laboratories at Culver City for new and improved missile designs.

Lightplane altitude record of 37,063 ft. has been set by Cessna Aircraft's turboprop XL-19B and confirmed by the Federation Aeronautique Internationale, the Wichita airframe builder announced last week.

President Eisenhower last week awarded Harmon International Trophies to USAF Col. Bernt Balchen (aviator), Jacqueline Auriol of France (aviatrix) and Walter L. Massie (aeronaut), chief pilot for Goodyear Aircraft Corp.

Fletcher Aviation Corp. has purchased basic patents on "jet cooling" and muffling systems from Prof. Otto C. Koppen of the Massachusetts Institute of Technology, is producing them at Pasadena, Calif., for Continental-powered Navions.

Douglas Aircraft has delivered the first of four DC-6Bs ordered by Alitalia, Italian Airlines.

Eastern Air Lines' first Wright Turbo Compound-powered Super Constellation was delivered to the carrier's main base at Miami, Fla., Nov. 10, is scheduled to go into operation on New York-Miami flights this week.

Financial

United Air Lines net earnings for the first three quarters of 1953 totaled $8,024,115, a drop of $238,890 from the same period of 1952. Operating revenues increased 10% to $131,141,489, but operating expenses climbed more than 15% to $114,374,856.

Fairchild Engine & Airplane Corp., Hagerstown, Md., reports record net earnings of $3,486,000 for the first nine months of this year, topping profits for the same period of 1952 by $1,599,000. Sales totaled $128,874,000, compared with $83,168,000 last year.

Navy Evaluates New Trainer Trio

First photo of the three light trainers being evaluated by the Navy at Corry Field, Pensacola, Fla., shows the planes in echelon, front to rear: Temco Plebe, Beech Mentor and Ryan 72. This is the first announcement of Beech entry in the competition; Plebe was first shown in Aviation Week Oct. 5, p. 7 and the Ryan was covered Oct. 12, p. 24 and Nov. 2, p. 26. Navy is studying all three to determine which is the most suitable replacement for its North American SNJ.

Trans World Airlines has deposited $4,626,000 in sinking fund and interest payments due on $40 million borrowed in 1946 from Equitable Life Assurance Society, cutting the loan to $20,049,000.

Eastern Air Lines ended the first three quarters of this year with a net profit of $2,795,911, compared with $1,773,875 for the first nine months of last year. Gross operating revenues increased 26.3% to $111,344,108.

Temco Aircraft Corp., Dallas, had net earnings of $1,499,280 for the nine months ended Sept. 30, compared with $1,359,894 for the same period last year. Sales totaled $41,888,179, a 7.78% increase.

Continental Air Lines reports a net income of $1,103,427 for the first three quarters of 1953, approximately five times the $218,673 net for the same period last year. Sharp increase reflects Continental's sale of its Convair 240 fleet. Operating revenues climbed 8.21% to $8,192,903.

National Airlines net income for the first quarter of fiscal 1954 totaled $178,243, compared with $173,243 in the corresponding period last year. Operating revenues increased to $7,532,623 from $6,051,175.

Curtiss-Wright Corp., Wood-Ridge, N. J., will pay a 15-cent dividend Dec. 24 to stockholders of record as of Dec. 4.

Ryan Aeronautical Co., San Diego, has declared a regular quarterly dividend of 10 cents on common capital stock plus an extra 10 cents, payable Dec. 11 to stockholders of record Nov. 30.

International

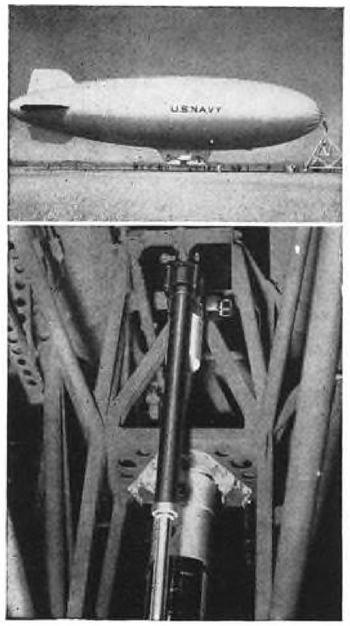
British Overseas Airways Corp. reports net profits of $344,400 for the six months ended Oct. 10, a $64,400 drop from the same period last year. BOAC blames a decrease in U.S.-Britain passenger traffic for the lower profit.

Sweden's Saab 32 all-weather jet fighter has reached transonic speeds in dives during development flight tests, a spokesman for the company reports. The two-seat Lansen, powered by a Rolls-Royce Avon, is in quantity production at Saab Aircraft Co.'s Linkoping factory.

Danish Ministry of Defense is negotiating for a number of British Hawker Hunters, expects to spend approximately $14,450,000 on the jet fighters and spares.

ZP2K LANDING GEAR

Airborne Actuated



The landing gear in Goodyear's ZP2K Navy blimp is actuated by Airborne's R-534M1 LINEATOR with a 12½ in. stroke. Airborne electro-mechanical actuators are specified by Goodyear — and most other manufacturers of military aircraft— for two reasons: they provide high power output in a minimum of space, and they can be counted on, however rugged the conditions.

Dimensions and data on Airborne products for the aviation industry are given in the I.A.S. Aeronautical Engineering Catalog.

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The Aviation Week

November 16, 1953

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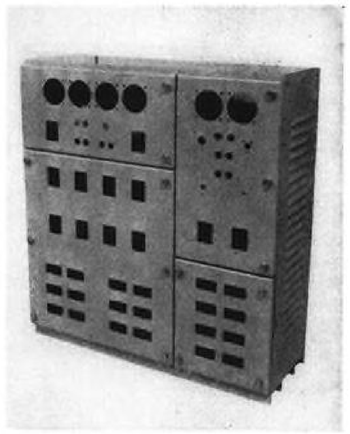
7—U.S.N.; 9—(top) Boeing Airplane; (center) U.S.N.; (bottom) McGraw-Hill; 14—U.S.N.; 17—(top, center) Dept. of Defense; 30, 32—Air France; 53—Temco; 99, 100—(top, center) Piasecki Helicopter.



Minesweeper Electric Distribution and Switch Cabinet, manufactured for Smith-Meeker Engineering Corporation. The frame is heliarc welded aluminum angle with heavy gauge aluminum face panels.

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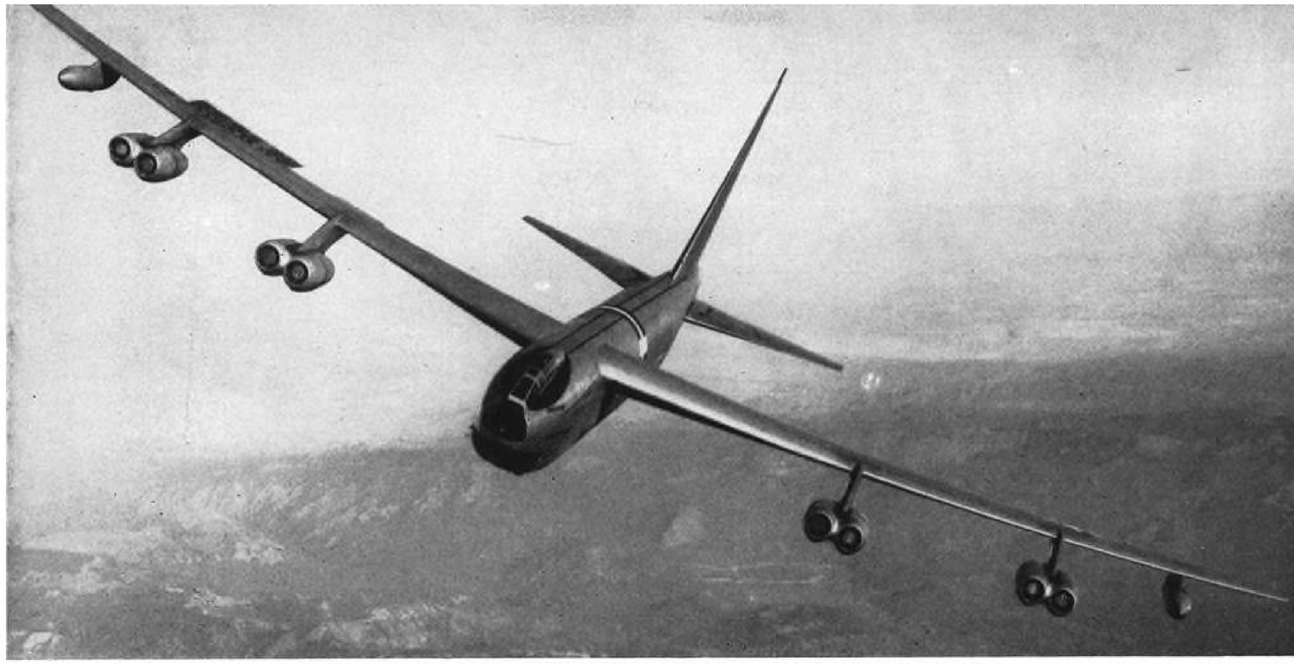
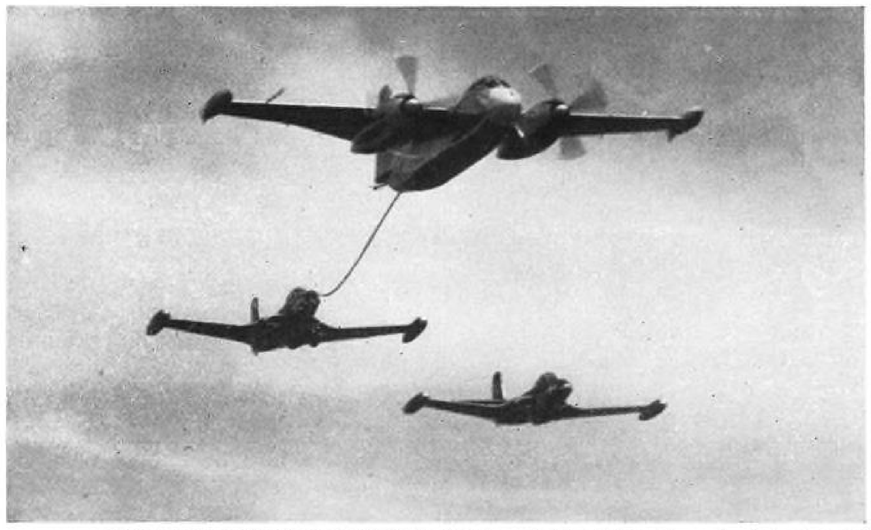


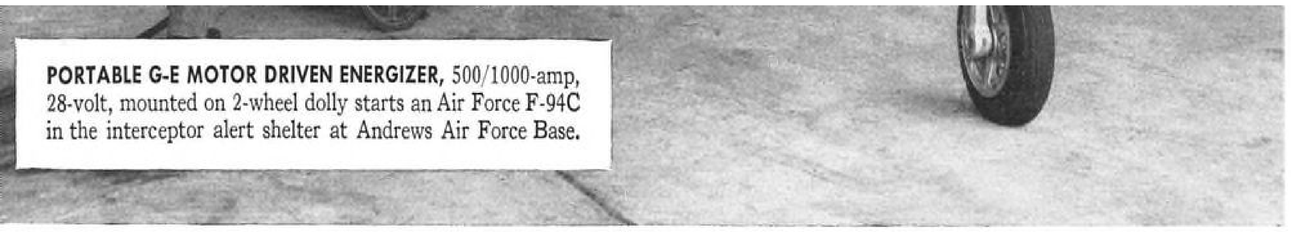
STRATOFORT FLEXES ITS WINGS—Flexibility of prototype Boeing B-52's 185-ft wings is emphasized in this view of the big bomber banking. Note spoiler extended near starboard wingtip. B-52 has eight P&WA J57 10,000-lb. thrust class jets (also see p. 17).



U.S., Foreign Military Jets In the Air

BANSHEE REFUELS ALOFT—Special weapons McDonnell F2H-2B Banshee jet fighter takes on fuel from a North American XAJ-1 (T) Savage tanker via the probe-and-drogue method, while a sister Banshee flies nearby.

FRENCH ORDER BAROUDEUR FLEET—French Air Ministry has ordered the S.E. 5000 Baroudeur lightweight tactical jet fighter (below) into production. Designed to operate from rough airfields, S.E. 5000 takes off from a rocket-propelled carriage, lands on skids.



PORTABLE G-E MOTOR DRIVEN ENERGIZER, 500/1000-amp, 28-volt, mounted on 2-wheel dolly starts an Air Force F-94C in the interceptor alert shelter at Andrews Air Force Base.

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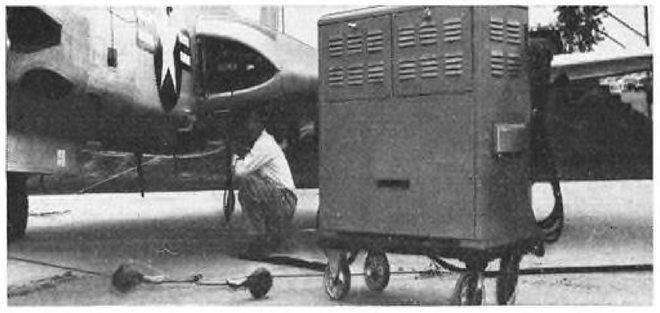
Engine Driven G-E Energizer, 28-volt, 500/1000-amp (above)
G-E Frequency Changer Energizer, 400-cycle (below)



Navy type NC-5 Energizer manufactured by O. E Szekely and Assoc., Inc. Phila., Pa., and equipped with G-E AC and DC generators and control (below)

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GENERAL ELECTRIC

WHO'S WHERE

In the Front Office

John R. Baldwin, chairman of the Canadian Air Transport Board, has been appointed deputy minister for air services in the Department of Transport.

William A. Patterson, president of United Air Lines, has been elected to the board of Westinghouse Electric Corp., New York.

Ramsey C. Armstrong is new chairman and president of Sierracin Corp., Burbank, Calif., succeeding **Elvin M. Bright,** who resigned to establish Bright Laboratories at North Hollywood. **Willis W. Benson, Jr.,** is Sierracin's treasurer and comptroller.

Ralph I. Meader has been appointed president of Minnesota Electronics Corp., St. Paul.

William P. Youngs has been appointed vice president-sales of Aircraft Supplies, Nutley, N. J.

Rear Adm. G. A. T. Washburn, pioneer Naval aviator, has become special assistant to the president of Turco Products, Los Angeles.

Changes

RAF Wing Cmdr. G. Lees has retired as deputy director of Britain's National Gas Turbine Establishment.

Clyde Parton has been promoted to engineering director at the Aeronautical Division of Minneapolis-Honeywell Regulator Co., Minneapolis.

Marvin A. Bennett has been appointed assistant manager of the Gas Turbine Division of Continental Aviation & Engineering Corp., Detroit.

Robert B. King is new production manager of engine machining at Ford Motor Co.'s Aircraft Engine Division, Chicago.

Walter B. Powell has become aircraft products sales manager for Air Associates' Aviation Supplies Division, Chicago. **Samuel Dente** has joined the Electronic Equipment Division, Orange, N. J., as plant superintendent.

Burnham Adams is new manager of sales, field service and contract administration for Pacific Airmotive Corp.'s Manufacturing Division, Burbank, Calif.

Col. Stanley R. Stewart (USAF Ret.) has joined the Electronic Specialty Co., Los Angeles, as sales director.

William A. Tweedie has been appointed manager of Temco Aircraft Corp.'s Garland, Tex., plant. Other promotions: **Herrol W. Bellomy,** plant manager at Greenville, Tex.; **John T. Butler,** assistant plant manager at Garland; **W. N. Hall,** assistant manager at Greenville; **Harold B. Ridgley,** tooling superintendent at Dallas; **Dovle Beasley,** sheet metal superintendent at Dallas.

Honors and Elections

C. R. Strang, chief project engineer at Douglas Aircraft Co.'s Santa Monica (Calif.) Division, and **Harold Luskin,** assistant chief of the Douglas aerodynamics section, have been cited by the University of Michigan for "outstanding achievements and contributions to the field of engineering."

INDUSTRY OBSERVER

► Convair has split the defensive weapons system for its XB-58 supersonic bomber into two development packages, with Emerson Electric taking the armament phase and Sylvania doing the detection equipment. These two contractors replace General Electric which had been negotiating with Convair previously to develop the complete defensive system (AVIATION WEEK Nov. 2, p. 84).

► De Havilland has begun production tooling for the Comet 3 and no further changes are expected in the general configuration of the latest in this jet transport series, although some design details are not yet firm. De Havilland has settled on elliptical single-pane windows for the new Comet rather than the double-panes favored by the U. S. Civil Aeronautics Administration. First Comet 3 is expected to fly in June or July of next year.

► Pentagon planners will concentrate any future off-shore procurement of military aircraft for the NATO countries on all-weather fighter types with very little, if any, future money going to day fighter types. Lack of adequate all-weather fighters is a serious NATO deficiency in view of the growing strength of the Russian jet bomber fleet in Eastern Europe.

► Powerplant Installation Subcommittee of the Aircraft Industries Assn. has developed detailed recommendations on oil coolers for turboprop engines which have been transmitted to the Navy Bureau of Aeronautics for the preparation of a military specification. Oil cooler manufacturers cooperated with AIA in the study.

► Propeller manufacturers have won a partial victory in their fight to get specific turboprop engine types assigned to them for highspeed propeller testing in their own facilities. Firms having high priority development contracts will be furnished turboprops of the specific types scheduled to drive their propellers for in-plant test work. Low priority projects will continue to be dependent on turboprops available only at Wright Air Development Center.

► Civil Aeronautics Administration has informed Aircraft Industries Assn. it considers delegation of the option allowing manufacturers of small non-transport type helicopters to certificate their own machines as premature because of the present fluid state of airworthiness rules for helicopters (Aviation Week Oct. 12 p. 11).

► Allison-Aeroproducts Division of General Motors Corp. reports one of its J33-35 centrifugal flow turbojets recently completed 1,200 hours of actual combat operational time powering a Lockheed F-80 in Korea. This J33 was shipped from Allison in 1950 and had gone through three minor field repair cycles in Korea with 800 hours as the longest interval between repairs. Allison also reports that another J33-35 installed in a Lockheed T-33 has operated for 1,000 hours without repairs.

► Final USAF boxscore on the workload of fighters in Korea shows the Lockheed F-80 Shooting Star was the jet workhorse, flying 36% of the 276,796 jet fighter sorties completed during the three-year war. North American F-86 Sabres and Republic F-84 Thunderjets each accounted for 31% of the sorties with the remaining 2% credited to Lockheed F-94 all-weather interceptors.

► Project to increase the sweepback of the Hawker Hunter to 50 degrees and boost power to the 10,000 pounds thrust of the Rolls-Royce R.A. 14 Avon have been shelved by the British Ministry of Supply after the prototype nearly was finished. British observers believe this may mean a new version of the Vickers Supermarine Swift, also powered by an R.A. 14, may have won the next competitive round for Royal Air Force production orders.

► Piasecki Helicopter Corp. is considering powering its third experimental prototype YH-16 twin-engine transport helicopter with Allison T56 turboprops rated at 3,750 eshp. The second prototype is nearing completion with the Allison T38 turboprop rated at 2,750 eshp. as its powerplants.

Washington Roundup

Service Secretaries Speak Up

Capitol Hill observers, accustomed to service secretaries speaking in unison, were surprised when Assistant Air Force Secretary H. Lee White (representing Secretary Harold Talbott) and Army Secretary Robert Stevens opposed Defense Secretary Charles Wilson's views, and testified in favor of military men for service comptrollers. It's the first time since the enactment of the 1947 Unification Act that the Secretaries have taken issue with the Secretary of Defense—without subsequent resignations.

Wilson dismissed the Stevens-White testimony: "Well, if that's what they said, that must be their opinion. . . . We try to let everyone use their own judgment to the maximum."

Carney Favors Nuclear Power

Chief of Naval Operations, Adm. Robert Carney, openly is challenging Secretary Wilson's decision canceling development of a nuclear powerplant for carriers. Navy should start converting all its major ships from oil to nuclear power now, he maintains.

Defense Budget Timing

The fiscal year 1955 defense budget is being rushed to completion so it can be included in the federal budget that will go to Congress shortly after the beginning of the year. This year, the new Administration's revised budget didn't go up until May, and it was August, a month after the start of the fiscal year, before the services had fiscal year 1954 money available.

Defense Secretary Wilson wanted to submit only a total defense appropriation estimate in January. But he was overruled by the President, so budget processing, which usually takes five or six months, is being telescoped into two and a half months.

- In mid-October, National Security Council tentatively set a status quo force level of 16 air carrier groups for the Navy and boosted the USAF force level from 120 to 127 wings.
- The services are due to submit their estimates to implement these forces to defense comptroller W. J. McNeil by Dec. 5.
- The estimates will be reviewed jointly by the Budget Bureau and McNeil's office in the following three weeks, with NSC making final decisions. Wilson predicts that the difference between service estimates and Defense Department estimates will be less than $5 billion.

New Air Defense Study

A new air defense study has just been completed for the National Security Council by a committee headed by Lt. Gen. Harold Bull. The committee leans toward the military position that air defense should be built outward from U. S. borders. Civil Defense Administration believes the major defense effort should be devoted to early warning systems in the Arctic.

Guided Missile Evaluation

A comprehensive report on the guided missiles program, due to be submitted to the Secretary of Defense Dec. 1, will make recommendations on development projects, and gaps in the program that should be filled. It is being drawn by a nine-member inter-service committee headed by Trevor Gardner, special assistant to the Secretary of Air Force for research and development (AVIATION WEEK Aug. 31, p. 18). The review has been going on for more than four months. Their report, which will be turned over to Assistant Secretary for Research and Development, Donald Quarles, and Assistant Secretary for Applications Engineering, Frank Newbury, is expected to be unanimous.

ODM: Fifth Wheel?

Office of Defense Mobilization seems to be on the outside looking in.

- ODM's directive on "packaging" machine tools in or near plants where they would be used in an emergency simply formalized Defense Department policy.
- ODM's coming directive on defense contract awards in manpower surplus areas is expected to be a reiteration of already established policy.
- Defense Department seems to be taking casually ODM's main task of drawing up an all-out mobilization plan. ODM has asked Defense to submit the full mobilization requirements of thousands of military end items by Nov. 15. Asked about this, Secretary Wilson said he was unaware of it, and added, "I suppose it is a routine mobilization study."

Rail Target: Bonanza

Railroad interests are singling out Bonanza Air Lines for attack in their campaign against subsidies. One rail spokesman said: "The 'fair and reasonable' mail compensation rate for Bonanza, whose certificate is now up for renewal, has been estimated by CAB at $947,803 for the current year. Of the total, $40,000 is tabbed service mail pay. The remaining $907,803, representing more than 95% of the total, consists of subsidy."

Hoover's Error?

Civil Aeronautics Board members are irritated at former President Herbert Hoover's reasoning for abolishing independent agencies. Hoover said that there are 70 or 80 independent agencies and that if the President devoted one hour a week to each it would take up 70 to 80 hours a week. The points are made that there are only about 12 significant independent agencies and that the President is not supposed to participate in the activities of the quasi-judicial regulatory agencies, the exception being CAB international cases.

More Defense Secretaries?

Outlook is that the Pentagon's corps of secretary-level officials, which now totals 23, will keep growing.

- Secretary Wilson has indicated he will ask Congress for legislation authorizing another assistant secretary to handle fiscal policy for each of the services.
- The present total of 23 doesn't give a complete picture: "Special assistants" and "assistants to the secretary," who report to the Secretary and have approximately the status of assistant secretaries, have been appointed—and more probably will be. For example, on Defense Department's organization chart, the "Assistant to the Secretary for Atomic Energy" has equal status with the assistant secretaries.

—Katherine Johnsen

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Air Policy Study Sidesteps Military Issues

- **First review since 1948 centers on civil aviation; some critics see little prospect of concrete results.**
- **Aircraft industry forecasts major airpower crisis will result from lack of adequate planning for services.**

By Robert Hotz

First attempt since 1948 to formulate a national air policy got under way last week in Washington.

Air Coordinating Committee appointed a special liaison group to direct the policy study and released a proposed agenda that confirmed AVIATION WEEK's earlier prediction (Oct. 5, p. 17) that the entire effort would be concentrated on the civil aspects of aviation without any attempt to deal with the hot political issue of adequate military airpower.

Members of the ACC special liaison group:

- **Charles O. Cary,** executive secretary, ACC.
- **Bradley Nash,** USAF.
- **J. T. Pyle,** Navy.
- **James N. Davis,** Army.
- **J. Paul Barringer,** State Department.
- **Fred B. Lee,** Commerce Department.
- **Emory Nunneley,** Civil Aeronautics Board.
- **Ira H. Abbott,** National Advisory Committee for Aeronautics.
- **Earl Wadsworth,** Post Office Department.

Representative for the Treasury Department has not yet been named. This group has asked the aircraft industry, airlines and any other interested parties to submit their written comments on both the proposed scope of the study and on their position regarding any specific item on the agenda. There will be no public hearings.

All industry comment must be submitted in writing to Charles Cary. ACC plans to hire no special staff for the study. It will depend on the special liaison group whose members all have other full-time government jobs. Earlier indications that the study might be completed by early next year have faded and a target date of late next spring or early summer seems more likely.

▶ **Industry Indifference**—Industry reaction to the ACC agenda was characterized by general indifference, based on the feeling that this is just another of the many "staff studies" which the Eisenhower Administration has been substituting for legislative action and there is little prospect of any concrete results from the survey.

There also is some feeling that the ACC study in narrowing its scope to civil aviation, has gone astray from the original intent of President Eisenhower's letter which specified a "comprehensive review of our aviation policy." These critics of the ACC study emphasize that no sound civil aviation policy can be formulated without an adequate foundation of military airpower and that until the growing problems of military airpower are tackled by the Republican Administration any study of civil aviation is doomed to futility.

▶ **Crisis Seen**—Industry observers report growing concern among second echelon Pentagon officials and aircraft manufacturing executives over the lack of planning and policy for future development, maintenance and employment of adequate military airpower. It is no secret in the Pentagon or in the manufacturing industry that if present policies are continued, a major crisis will confront the aircraft industry in 1955 and 1956.

There is a strong feeling in certain military and industry circles that a new military airpower policy must be developed by the Republican Administration and presented to the next session of Congress for legislative approval if this crisis two years hence is to be averted.

A spokesman for the Aircraft Industries Assn. admitted that major decisions would be required this year to fend off the impending crisis, but indicated that AIA was not certain if "the time were ripe" for a public focus on the need for a full-scale development of an adequate military airpower policy.

▶ **Policies Abandoned**—Pentagon observers emphasized that many of the industrial mobilization and procurement policies of the previous Administration have been abandoned without any new program to take their place. Full effect of the $4-billion cut in the fiscal year 1954 aircraft procurement budget will be felt by the industry in 1956.

Both Pentagon and industry observers agreed that the Air Coordinating Committee probably was not the best agency to tackle a full-scale military airpower study. Consensus was that either the National Security Council or a separate commission of top-flight civilians, similar to the Finletter Commission, should assume this task.

Following is the proposed agenda for the ACC policy study:

▶ **Air Transport:**

- Airline subsidies. Direct federal aid in relationship to industry's present stage of development and the overall fiscal policies of the Eisenhower Administration.
- Role of U. S.-air transportation system.
- Nonscheduled airline operations.
- Policies and standards to be utilized in establishing air route patterns.
- Movement of mail by air.
- Air cargo operations and development.
- Federal government use of U. S. military and commercial air transportation.
- Air transport mobilization planning.

▶ **Airports:**

- Federal aid airport grants. Continuation of amendment of existing program.
- Review of primary recommendations of the President's Airport Commission (Doolittle Report).
- Joint civil-military use of airports.
- Airports in foreign territory. Rights of U. S. aircraft to use such airports.

▶ **Airways:**

- User charges policy with respect to aeronautical facilities and services.
- Development and implementation of a common civil-military system of airway facilities and services.
- Review of domestic airways system in terms of division of responsibility among federal government, local governments and industry.
- Aeronautical communications.

▶ **International Aviation:**

- Provision of aids to air navigation.
- International exchange of air transport rights.
- Establishment of fares and rates in international air transportation. (1) U. S. legislation; (2) U. S. government relationship to the International Air Transport Assn.
- International Civil Aviation Organization. The role of ICAO in international civil aviation; U. S. participation in ICAO.
- Facilitation of international civil aviation. Simplification of entry and

exit requirements pertaining to international flights.

• Economic aid and technical assistance. Action in the multilateral (ICAO) and bilateral fields.

▶ **Aircraft and Equipment Manufacture and Sale:**

• Role of federal government in development of new transport aircraft.

• Sale of U. S. aircraft and aeronautical equipment abroad.

• Sale of foreign aircraft and aeronautical equipment in the U. S.

▶ **Aviation Safety:**

• Federal government's role in the field of aviation safety.

• Control and coordination of search and rescue.

▶ **General Aviation:**

• Personal aircraft. Development of aircraft possessing increased utility and operating economy.

• Airman training. The federal government's role in training flight and technical ground personnel.

• Aviation education and information. The federal role in these areas.

▶ **Federal-State-Local Relationships:**

• State actions in the regulatory field. Promulgation by states of aviation safety regulations; enforcement by states of federal government safety regulations.

• Economic regulation of air transportation. Federal-state relationships in this field.

• Multiple state taxation of aviation operations.

• Exercise of control over airspace as among the federal, state and local governments and private interests.

▶ **Research and Development:**

• Aeronautical research and development programs in the field of civil aviation.

Airway Cuts

- **CAA trims operations, continues staff layoffs.**
- **Airline telephone cost is shifted to carriers.**

Civil Aeronautics Administration is cutting airways facilities, shifting additional cost of services to airlines and making new slashes in personnel.

The new cuts leaked out last week despite a news blackout drawn by CAA administrator Fred B. Lee around his economy program.

In addition to slashes recently reported in AVIATION WEEK (Aug. 10, p. 51; Sept. 28, p. 80; Nov. 2, p. 7), the reductions include:

• **Shutdown** of approximately half of the standby generators en route and terminal aids, saving an estimated $300,000 a year. CAA has prepared a national priority list on these facilities for use of regional administrators in determining which local situations justify shutdown.

• **Airlines' telephone** lines to Air Traffic Control networks now must be paid for by the airlines, CAA has advised Air Transport Assn. Saving is estimated at about $142,000 a year. Other similar transfers are in preparation, airways officials revealed to AVIATION WEEK. These transfers of completely private services are in addition to CAA's proposal to levy "user charges" for its overall public service.

• **Low-frequency ranges** and communications stations are under review by regional administrators, who will propose cuts to the regional "user airspace committees" of Air Coordinating Committee.

• **CAA photographic lab** shutdown is the latest internal cut. The 10-man staff has received notice of employment termination as of Dec. 31. This Washington facility did photographic work for aviation safety and airways manuals, CAB accident investigations, and other aviation photographic services.

▶ **CAA Personnel Layoffs**—Employe "reductions in force" are emptying many rooms of CAA headquarters in Washington as well as field offices. Assistant Administrator S. A. Kemp says that CAA employment dropped from 15,372 on July 1, 1952, to about 14,600 on July 1, 1953, and the total has dropped further this summer and fall. Extent of further reductions in force by Christmas depends on decisions being made last week, he said.

To soften the blow, CAA recently issued a freeze on filling vacancies resulting from resignations. Hiring to fill any vacancy requires the approval of either the administrator or his assistant.

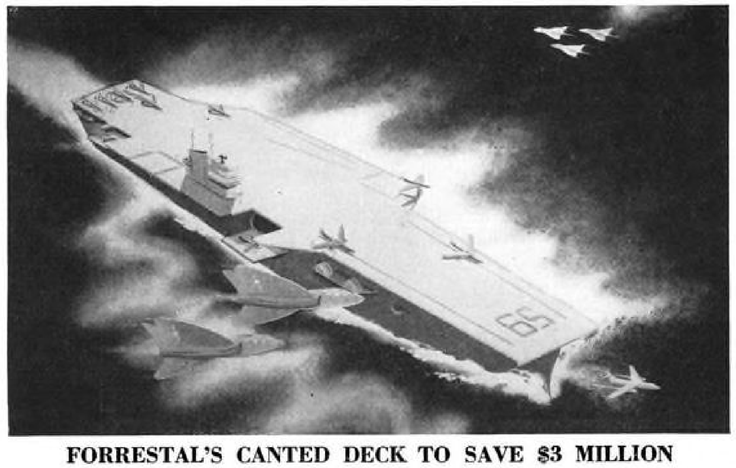
This freeze anticipates resignations in excess of the average annual CAA turnover of 5% (airways 6 to 7%, smaller offices 2 to 3%). But some involuntary reductions in force continue. In Washington, Kemp cites reduction of the office of Aviation Defense Requirements from 27 to 11 last February and recently to four.

▶ **Positive CAA Program**—Despite the secrecy surrounding Lee's program, AVIATION WEEK finds a number of positive policies and programs under way. These include:

• **Operation of any facility** that local authorities are willing to pay for. Federal Airways Director J. M. Beardslee points out that the facilities cuts executed or planned are federal budget reductions. CAA is anxious to provide local facilities when the local units are willing to pay their own way. Lee stressed this offer in a speech delivered last week to the Greater Miami Aviation Assn.

• **Cooperation with industry** in taking over any job formerly operated by CAA. The noise abatement program is not in federal budget now, but CAA informally will help industry in its attempts to reduce aircraft noises objectionable to local communities.

Administrator Lee last week announced CAA's Republican policies (much as Commerce Undersecretary Robert Murray previously had done): "The federal government cannot play the Great White Father to all segments of civil aviation in all communities for all time. . . . Unfortunately, no one yet has discovered a way of saving money in general without saving it in particular.



FORRESTAL'S CANTED DECK TO SAVE $3 MILLION

Redesign of the flight deck on the Navy's new giant aircraft carrier USS Forrestal to canted or angled configuration is expected to save $3 million in cost of building the ship. Artist's conception of the carrier shows jet bombers being launched simultaneously over the bow and off the ship's port deck. Note planes being hoisted to the flight deck by outboard elevators aft and amidships of the Forrestal's starboard side.

You cannot expect us, therefore, to perform every service which might be desirable. What you do have a right to expect is that CAA will perform every service which is essential, in terms of our responsibility for public safety."

GM Buys Kaiser's Willow Run Factory

Kaiser Motors Corp. last week sold its big Willow Run, Mich., plant to General Motors Corp., the lowest bidder, for $26 million. Entire proceeds of the sale will go to pay a major part of Kaiser's remaining indebtedness to the government.

After a $60-million fire destroyed its Livonia, Mich., Hydramatic transmission plant last August. General Motors leased 1.5 million sq. ft. of factory space at Willow Run. Requests to lease 50,000 additional sq. ft. of space this month set off rumors that a sale was imminent.

▶ **Secret Bids**—However, Edgar F. Kaiser, president of Kaiser Motors, called for bids some weeks ago on a top level, highly secret basis. GM won the bid and gradually will take over the Willow Run plant within the next 12 months.

The 4,402,110-sq. ft. Willow Run plant, largest in the world for one-floor capacity, was built during World War II. Ford Motor Co. assembled B-24 Liberator bombers in the giant plant until Kaiser-Frazer Corp. leased it in 1945 from Reconstruction Finance Corporation in order to produce automobiles.

Kaiser bought the plant three years later for $15.1 million and produced both cars and Fairchild C-119 packet AF transport there. The company had started assembly of a second Chase C-123B assault transport before Air Force canceled the C-119 and C-123B contracts last June 29, p. 16.

Kaiser will move its auto assembly, stamping and related operations next year from Willow Run to its Toledo, Ohio, plant where it has more than 5,000,000 sq. ft. of manufacturing area available.

▶ **Loan Reduced**—With the sale proceeds plus an additional $613,000, Kaiser will reduce its government loans to $18,640,000. At one time the firm owed the government $74,789,843, borrowed for automobile production. The maturity date of the remaining amount, the company said, has been shortened from 1968 to 1959.

General Motors presently has 7,000 employes at work in its leased space at Willow Run. That company recently turned out its first Willow Run-built transmission, 12 weeks after the Livonia fire.

Rep. Carl Hinshaw

Hinshaw to Receive 1953 Wright Award

Rep. Carl Hinshaw (R.-Calif.) has been designated by the National Aeronautic Assn. to receive the 1953 Wright Brothers Memorial Trophy for "fostering the sound and consistent growth of aviation in all its forms . . ."

Hinshaw has been prominent in support of aviation during his 13 years in Congress, serving on numerous committees, the Congressional Air Policy Board and as advisor to the U. S. delegation in the International Civil Aviation Organization. He is a member of the Society of Automotive Engineers and Institute of the Aeronautical Sciences.

The trophy, a 12-in. span replica of the historical Wright airplane, will be presented formally to Rep. Hinshaw by President Eisenhower at the Aero Club of Washington's Wright Memorial Day dinner at the Hotel Statler, Washington, D. C., Dec. 17.

Dr. Leslie A. Bryan, director of the Institute of Aviation, University of Illinois, has been awarded the 1953 Frank G. Brewer Trophy by NAA for numerous contributions to the development of aviation education in the U. S. since 1924. Bryan also will receive his award from the President at the Wright dinner.

115 USAF Wings By Mid-54: Wilson

Air Force will have "at least 115 well-equipped wings" by June 30, 1954, Defense Secretary Charles E. Wilson said last week. It is an example, he said, of the Air Force "getting its house in order."

"They thought they could only get 100 good wings by that date," he said, "and I thought they could get 114. . . . They have done a lot of things in the Air Force to improve and balance their program. When they realized something wasn't right they found ways to fix it and promptly took the necessary action."

Wilson reiterated his hope that "our total defense effort is at or near the peak." Military totals are still substantially the same as they were nine months ago, he said, but a reduction of supporting personnel is expected to be achieved shortly.

Stroukoff Negotiates For Chase Contract

Stroukoff Aircraft Corp., West Trenton, N. J., is negotiating with Air Force to obtain a research and development contract formerly held by Chase Aircraft Co. for a panta-based transport (hydro-ski version of the C-123B).

USAF earlier awarded Chase's other research contract for a boundary layer control for the C-123B to Stroukoff. The contracts have been held in abeyance since the split of Chase (AVIATION WEEK Sept. 7, p. 14) into two companies, Stroukoff and the Kaiser Motors Corp. owned Chase company.

Canada Strikes Back At CAB Restriction

Toronto—Canadian Air Transport Board has ordered Colonial Airlines and Pan American World Airways to show cause by Dec. 15 why they should be permitted to continue using the same aircraft for serving Canadian points as are used on through flights.

The ATB order strikes back at Civil Aeronautics Board's refusal to allow Trans-Canada Air Lines to use the same transports for its new weekly Montreal-Toronto-Mexico City services as are scheduled for its Toronto-Montreal-Tampa operation.

TCA's new service, scheduled to start Oct. 31, has been delayed indefinitely (AVIATION WEEK Nov. 9 p. 7).

Colonial operates services from New York to Montreal, from Washington to Ottawa and Washington to Montreal, the latter two with the same plane. PAA flies from Seattle to Fairbanks, Alaska, via Whitehorse, Yukon territory—patterned Seattle-Whitehorse and Whitehorse-Fairbanks. Strict interpretation of regulations under the air transport agreement signed by the two governments at Ottawa June 4, 1949 would force passengers to disembark at Whitehorse and go through formalities again to continue their passage.

New Cuts Likely in AF Spending

Tighter fiscal and inventory control probably will reduce aircraft spares, parts and engine procurement.

Reductions in aircraft spares, parts and engine procurement requirements of the Air Force are in prospect as a result of closer fiscal control.

Here are key points of a report by Assistant Air Force Secretary for Management, H. Lee White, to Senate Armed Services Subcommittee investigating failure of the three services in four years to implement adequately legislation aimed at putting Defense Department on a business-like financial basis:

• **Through application** of new techniques for relating requirements for aircraft spare parts to available physical and financial assets, USAF concluded during fiscal 1953 that money on hand from prior year's appropriations "were in excess of $1 billion of requirements." USAF has "every expectation additional savings will be realized" by the tighter fiscal and inventory control reducing procurement requirements, White told the subcommittee.

• **Re-computation** of engine-life expectancy in the B-47 program, which resulted in the elimination of 4,000 powerplants costing $200 million, White reported, is the first step toward USAF's objective of trimming engine requirements through more exacting inventory control. Because of associated cutbacks in spares, parts and overhaul facilities, he estimated the total saving on the B-47 program at substantially more than $200 million. Under AF's re-computation, applying actuarial methods, the life expectancy of the J47 was increased from 150 to 300 hr. The same actuarial computation now is being applied to other engines under procurement, White said, "and further considerable savings are being achieved."

• **By the end** of the year, USAF will be ready to put Military Air Transport Service on an independent working-capital basis, after the pattern of Military Sea Transport Service. MSTS was chartered with an initial capitalization, and charges customers—Army, Navy, Air Force—for services.

White made it clear that Air Force has not made a definite decision to go ahead with the change in MATS management. Until this year, USAF has balked at taking any step in this direction, and had its way. But Defense Secretary Charles Wilson seems determined to make the change, and the House Appropriations Committee, which repeated its severe criticism of MATS' management this spring, is likely to insist on it.

►**MSTS Cited**—"Working capital funds within the Department of Defense have proved their value," Wilson told a news conference. "An outstanding example is MSTS—which because of increased operating efficiency possible under business-like management and financing, is saving the taxpayers $120 million annually."

Members of the House and Senate Appropriations Committees have been dissatisfied with Air Force's method of computing the obsolescence of planes, feeling that the periods set—seven years for transports, five years for bombers, three years for fighters—were too short. But White told AVIATION WEEK that USAF does not now intend to reconsider the matter.

Senate investigation of the military departments' fiscal policies came about as a result of an earlier probe of the Korean ammunition shortage, which disclosed inventory control failure stemming largely from loose fiscal control.

►**Fiscal Gaps**—These are some of the gaps in military fiscal methods that make it difficult for congressmen to evaluate programs and come up with realistic decisions in appropriating funds:

• **Cost accounting** of depot operations is inadequate, and it is difficult to compare the operations costs of one depot with another either in the same or another service.

• **Funds for aircraft** spares and parts are listed under so many budget headings that, at best, detailed research is required to ascertain the total outlay in this category.

• **Even with breakdown** of complete aircraft under the major head "Aircraft and Related Procurement" in USAF's budget, it is not possible to ascertain precisely the outlay for planes. The complete aircraft category includes funds for such items as salaries, travel, transportation, communication services, rents and utility services, "other contractual services," lands and structures, taxes and assessments.

►**Estimates Off**—Expenditure estimates of the military have been notably off-base. For example:

• **In January 1952,** Defense Department reported that expenditures for aircraft and related procurement for the coming fiscal 1953—to start July 1, 1952—would be $9 billion.

• **By January 1953,** with six months of the fiscal year passed, the department changed its expenditure estimate to $4.3 billion.

• **Current estimate** is that fiscal 1953 expenditures for aircraft and related procurement amounted to $6.5 billion.

On the issue of organization for firmer financial control there were these developments at the Senate hearings:

• **Defense Secretary Wilson** backed up the position of Navy Secretary Robert Anderson that the financial structure of each service should be headed by a civilian comptroller. This is the present setup in the Navy. Undersecretary of Navy Thomas Gates is comptroller. Rear Adm. E. E. Clexton, and a civilian, N. P. Cassidy, serve as assistant comptrollers reporting to Gates.

• **Air Force** and Army opposed this and argued for a military comptroller, reporting jointly to the chief of staff and the secretary of the service through an assistant secretary. Lt. Gen. Charles B. Stone, USAF comptroller, now reports to the AF chief of staff and Assistant Secretary White.

Presenting USAF's case, White argued that odds are the calibre of a lieutenant general would be above a $15,000-a-year civilian. He claimed that through financial responsibility, the military man has a background of cost-consciousness when he assumes command posts. White conceded that a civilian probably would have greater independence but said this one factor is not sufficient to tip the scales against a military comptroller.

NAA Resumes Wage Bargaining With Union

Los Angeles—North American Aviation and United Auto Workers (CIO) last week resumed joint negotiations aimed at ending the wage walkout that halted production at NAA plants in California and Ohio.

Federal mediator John Fenton reported no progress at mid-week.

Meanwhile, North American asserted that nearly 5,000 employes had crossed the picket lines to return to work at all plants.

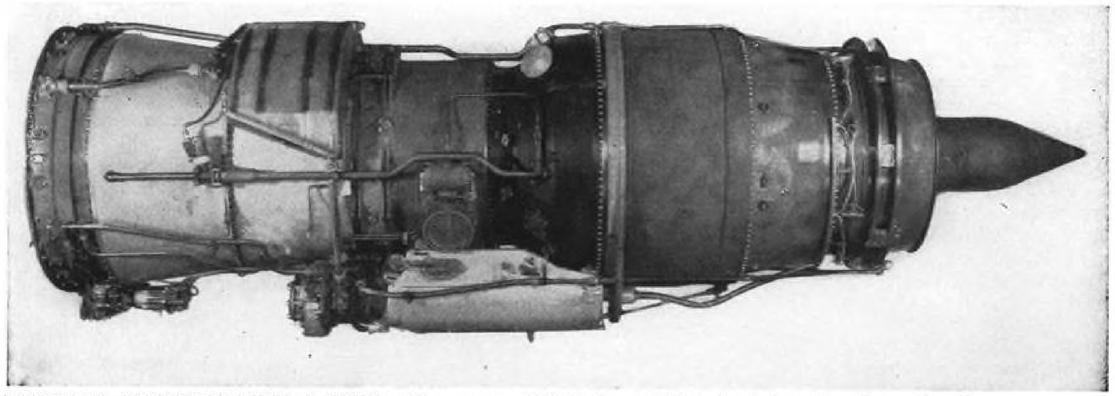
"We don't pretend we are pushing planes out the doors," said a company spokesman, "but people are back at work in almost all departments."

The union disputed NAA figures on the number returning to work. West Coast representative John Allard said: "Instead of growing, the number of these reporting to work is substantially less than in all plants last week."

The labor scene elsewhere in the industry was relatively quiet.

Lockheed Aircraft Corp. workers, represented by the International Association of Machinists (AFL), rejected the company's latest wage offer by a 5-to-1 margin but voted in favor of resumption of negotiations. Bargaining talks also were under way at Douglas Aircraft Co.'s Santa Monica plant.

AF Permits First Look at P&WA J57



EXTERNAL CONFIGURATION of P&WA split-compressor J57 (intake at left) is detailed in first photo released.

- **10,000-lb.-thrust-class rating is confirmed.**
- **Jet gives U. S. two-year lead, producer says.**

U. S. Air Force lifted a corner of the official security wraps from the Pratt & Whitney Aircraft J57 turbojet last week by releasing external pictures and confirming its rating "in the 10,000-lb. thrust class."

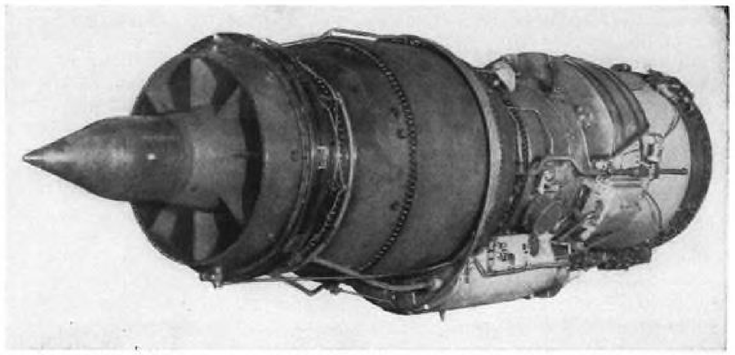
USAF explained that the "10,000-lb. thrust class" meant that the J57 had reached this power one or more times during its official 150-hr. type test but that this did not constitute its official power rating. USAF declined to reveal the official J57 power rating on the grounds of military security, but industry sources indicated it was about 9,500 lb. thrust for models currently being delivered to airframe manufacturers.

►**'Most Powerful'**—Commenting on the USAF announcement, William P. Gwinn, P&WA general manager, said:

"The J57 engine is the most powerful turbojet known to be in production. This engine is the first in aviation history to achieve a five-figure power rating. We believe at Pratt & Whitney Aircraft that the J57 is at least two years in advance of any other engine we know of in the turbojet field. This includes British as well as American jet engines."

Gwinn's statement was apt to stir rebuttal from British sources who could cite the Bristol Olympus with an official rating of 9,750 lb. thrust and the Rolls-Royce R. A. 14 Avon officially rated at 9,500 lb. thrust as equal to or, better than the J57's official rating.

►**'Blue Chip' Engine**—The J57 is P&WA's "blue chip" engine in the jet field with a large-scale production pro-



REAR VIEW of J57, showing vanes angled around powerful turbojet's exhaust nozzle.

FLIGHT TESTS include taking J57 aloft under North American B-45 bomb-bay.

gram planned for both USAF and Navy aircraft and the additional prospect of commercial jet transport applications.

Currently the J57 is earmarked to power the Boeing B-52 eight-jet Stratofort bomber; the Boeing project 707 commercial jet transport and aerial tanker; North American F-100 Super Sabre day fighter; Convair F-102 all-weather interceptor; McDonnell F-101 Voodoo long-range escort fighter; Douglas F4D Skyray carrier-based all-weather interceptor, and Douglas A3D carrier-based jet bomber.

For fighter installations, the J57 is equipped with an afterburner that boosts its total thrust to just under 15,000 lb. for short intervals. P&WA says the J57 has been in production at its East Hartford plant since last February. The Ford aircraft engine plant in Chicago also is tooling for production of the J57 under a P&WA license and the Navy is considering establishing a third source of production in one of its new government-financed plants originally scheduled to build other engine types.

▶**Split Compressor**—The J57 features a split-compressor design that was pioneered by P&WA and since has been utilized by Bristol in England and Curtiss-Wright Corp. in the U. S.

The split-compressor design provides fast acceleration, high compression ratios, low specific fuel consumption and greater operational flexibility. P&WA also is applying its split-compressor design to advanced developments in turboprops.

The J57 is the first turbojet to be designed and developed by the P&WA engineering staff headed by Wright Parkins, engineering manager, Perry Pratt, chief engineer, and W. D. Gove, a senior development engineer.

Speed Records

North American Aviation has not given up in its attempt to set a new 3-km. speed record with the F-100. As soon as desert temperatures are high enough, another effort will be made to top the Douglas F4D record by the required 1%.

Meanwhile, Douglas may go after the 15-km. speed record claimed by NAA for the F-100. This time, Douglas would use the D-558-II Skyrocket. Douglas believes the Skyrocket has the necessary rocket fuel capacity to cover the 15-km. course twice at a speed above 800 mph.

CAB Orders Nonsked To Change Name

North American Airlines must omit the word "American" from its name to prevent unfair competition with American Airlines, Civil Aeronautics Board has ruled.

The Board concluded: "That American Airlines was incorporated under that name before North American adopted the trade name of, or changed its corporate name to, North American Airlines; that the term 'American' had acquired a secondary meaning before North American adopted that trade name or so changed its corporate name, and such secondary name continues to exist." The Board added that North American's use of "any combination of the word 'American' constitutes an unfair or deceptive practice and an unfair method of competition."

▶**Decision Criticized**—The decision evoked criticism from the Senate Small Business Committee. The committee's official weekly staff report called the action "persecution of independent airlines" and added:

"It is significant that the Board has never promulgated a similar order against either Pan American World Airways or the former All-American Airways."

North American is the biggest domestic nonscheduled airline and competes directly with American Airlines on transcontinental routes.

CAB member Joseph Adams dissented from the four-man majority opinion. He said: "I feel that neither our office of enforcement nor the intervenor, American Airlines, has successfully borne the burden of proving the existence of unfair competition since in my view, although some public confusion has been demonstrated, I do not agree that it is substantial, or more than temporary." Adams cited court opinions that public confusion must be substantial or unavoidable, rather than restricted to a relatively few uninformed customers.

▶**Petition Likely**—Washington observers expect North American to petition for reconsideration, and, failing that, to seek judicial review of the case. If the courts eventually uphold the CAB decision, North American may adopt a version of the "air bus" name that it recently registered.

New Firm to Build Spray/Dust Planes

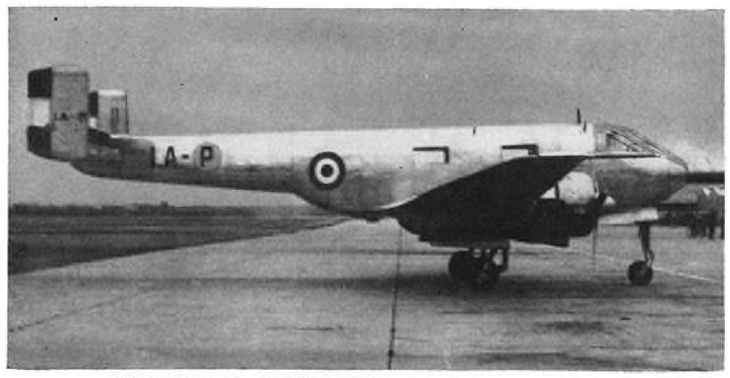
Newly organized Central-Lamson Corp. plans to produce 12 air tractor spray/dust planes by May of next year at its Yakima, Wash., plant. The company says an additional 50 air tractors will be turned out by February 1955.

Prototype of the new air tractor was built by Central Aircraft Inc., Yakima, (AVIATION WEEK Aug. 17, p. 426), with engineering handled by Lamson Aircraft Co., Seattle. The specially designed agricultural biplane, powered by a 450-hp. Pratt & Whitney Aircraft Wasp Jr., features a working dust capacity of more than 2,500 lb. or 360 gal. of spray and has interchangeable wing and tail panels.

President of Central-Lamson is Robert Lamson.

Hydraulic Conference

One-hundred hydraulic experts representing U. S. and foreign airlines attended the third annual Transport Aircraft Hydraulic Conference at Detroit Nov. 3-4. Detailed coverage of the Vickers-sponsored meeting will appear in an early issue of AVIATION WEEK.



ARGENTINA TESTS MULTI-PURPOSE PLANE

Designed for training and light tactical missions, this new I.A. 35, built by the Instituto Aerotecnico, Cordoba, Argentina, is undergoing flight tests. Gross weight of the twin-engine all-metal plane is 12,540 lb. Top speed is estimated at 220 mph. For training purposes the I.A. 35 will seat three; as a bomber it would carry a crew of five. Ambulance and cargo versions also are planned. Retractable tricycle landing gear is fittted.

EEMCo technical bulletin

new motor for small fans, blowers, pumps

light ★ 23½ ounces

small ★ 6 inches long, 2¼ inches in diameter

rugged ★ 2000 hours brush life, minimum

This new EEMCO motor was designed for a wide variety of uses where a light, compact unit with unusually long life is required. It is tooled for large quantity, low cost production. All cast components are either die, investment, or molded.

The basic design is extremely flexible. Speed can be varied by changes in winding and/or lamination stack length. Wound for 28 volt D.C.; it can be wound for either 110 volt A.C. or D.C.

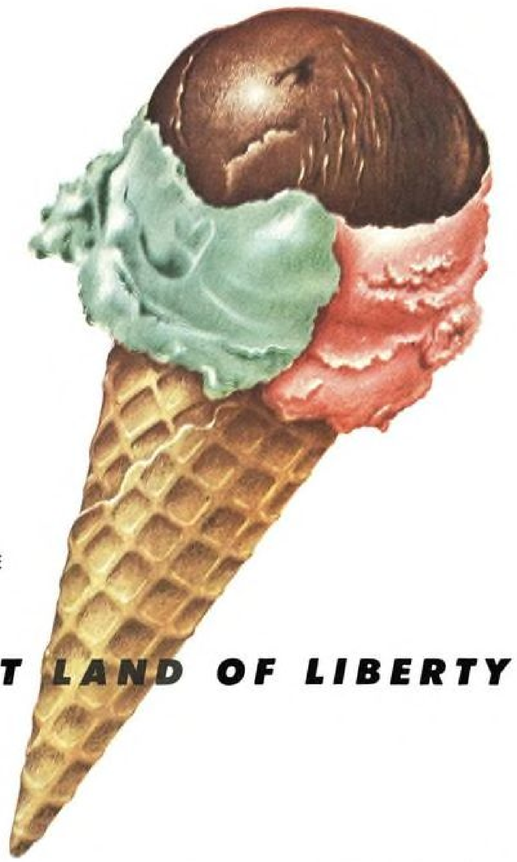
performance data

★ 50 watts continuous at 7500 RPM
★ 40° centigrade rise at sea level operation and normal ambient
★ Weight 23½ ounces
★ Dimensions 6 inches long, 2¼ inches diameter
★ Brush life at least 2000 hours
★ Designed to meet ANM-40 specifications

actual size

electrical engineering and manufacturing corporation
4612 west jefferson blvd., los angeles 16, calif.

3-520



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NUMBER ONE IN A PATRIOTIC SERIES • REPRINTS ON REQUEST

'Dollar Barrier' Holds Pacific Air Tourists

Air tourist travel from the Far East to the United States is held to a minimum by a scarcity of dollars in the sterling block nations, says Sir Leonard Isitt, Air Vice Marshal of New Zealand and a member of the executive committee of the Pacific Air Travel Assn., a group formed to foster travel in the Pacific area.

"Until the dollar barrier is overcome we can't anticipate any flow of holiday visitors to the U.S.," declares Sir Leonard. The loss of customers from the Far East is considerable, he believes, citing as an example that one out of every 330 New Zealand citizens visited England last year.

▶ **Business vs. Pleasure**—A New Zealander going to the U.S. can buy his ticket in pounds but must obtain dollars for expenses. The number of pounds he is allowed to exchange for dollars depends on the importance of the trip (he would be allowed more for a business journey than for a pleasure jaunt) and on the current dollar balance enjoyed by the country.

The Pacific Air Travel Assn. is financed by its 54 active members, such as governments, which pay a $400 fee and Allied members, which include travel agents, hotel associations, airlines and shipping companies, can join for $50.

Air National Guard Gets First F-86s

First deliveries of North American F-86 Sabre jet fighters, promised by Lt. Gen. Orval Cook, USAF deputy chief of staff for materiel (AVIATION WEEK Nov. 2, p. 18), have been made to two Air National Guard fighter-interceptor squadrons of ANG's "Northwest" wing headquartered at Spokane, Wash.

▶ **Sabre Units**—The units are the 186th F-I Squadron, Great Falls, Mont., and the 190th at Boise, Idaho. In the next few months other units, the 116th F-I Squadron, Spokane and the 123rd, Portland, Ore.; the 176th, Madison, Wisc., and the 126th, Milwaukee, Wisc., will get their Sabres.

By the end of June 1955, 67% of the 27-wing Air Guard will have first-line aircraft (AVIATION WEEK Oct. 26, p. 9). At the end of 1953, every unit having adequate runways and facilities will be all-jet, ANG officials say. During this fiscal year, $25 million is scheduled to be spent on jet facilities.

INTERNATIONAL INTEREST IN UAL 'DOCK'

Top-ranking executives from a number of international airlines are seen viewing a model of a proposed air dock developed by United Air Lines for speeding handling of passengers and cargo. They are among the 22 top-ranking personnel who flew to UAL's Denver, Colo., operational base after the annual meeting of the International Air Transport Assn. in Montreal last month. Left to right are: Per M. Backe, senior vice president, Scandinavian Airlines System; Dirk Wessels Van Leyden, general manager, Aerolineas Argentinas; J. D. Crichton, UAL engineer and air dock designer; N. D. Boratynski, UAL director of design, building and airports; S. J. Ahola, president, Aero O/Y, Finland; Gen. Henri Ziegler, president, Air France; Dr. Walter Berchtold, president, Swissair; B. S. Shenstone, chief engineer, British European Airways Corp.; Raymond Dupre, vice president, Air France; Orn O. Johnson, general manager, Icelandic Airlines, Gen. Luigi Gallo, director general, Linee Aeree Italiane.

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NO WELDING OR BRAZING used in end fitting attachment.

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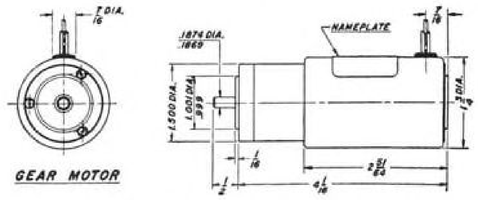

SPECIFICATIONS FOR MODEL GM49P-1

400 Cycle Capacitor Run Induction Gear Motor

115 Volts • 400 Cycles • 1 Phase • 0.5 Amps.
Full Load Torque: 100 Oz.-In.
Starting Torque: Over 100 Oz.-In.
Gear Head Lubricated per Mil-G-3278
22 R.P.M. • 314 to 1 Gear Ratio • Reversible Rotation
Intermittent Duty: 15 Minutes on, 15 Minutes off

Ambient Temperature: −55° to +74° C

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► **Lots of Holes**—Air Force has 60 days to file its answer with the court through the Justice Department.

USAF attorneys have intimated that ONA's complaint has no chance in court since the case is merely one of terminating a lease. No restraining order is involved, therefore the Air Force cannot be enjoined from going ahead and "recapturing" its four aircraft.

However, Air Force officials say the airline will have a "reasonable" period to return the aircraft if the new $12,300 lease is not signed.

Signing of new leases for USAF's excess C-54s is the result of months of study by Air Force attorneys who have been tightening the lease agreements. One attorney said the leases had "lots of holes." And as a result of this study USAF has been able to increase its rentals.

ATA Stresses Quality Control, Management

Improved management methods and quality control were discussed by some 100 airline executives attending the Air Transport Assn.'s annual maintenance and engineering conference at Miami Beach, Fla.

Discussions at the closed meetings of the conference centered on two major aspects of management methods, according to Milton Arnold, ATA vice president-operations and engineering:

• **Personnel utilization,** improvement and encouragement.

• **Stock control,** or maximum materials availability with minimum inventory.

Statistical quality control received special emphasis, reports ATA engineering director Allen Dallas. He says this

ATA Agenda

Special engineering and maintenance meetings of Air Transport Assn. airlines with manufacturers are scheduled by ATA for the period before the next annual conference:

• **United Aircraft Corp.,** Dec. 1-3. Host airline: United Air Lines.

• **Wright Aeronautical,** January. Eastern Air Lines.

• **Consolidated Vultee Aircraft Co.,** February. Braniff Airways.

• **Lockheed Aircraft Corp.,** April. Capital Airlines.

• **Douglas Aircraft Co.,** May. National Airlines.

• **Boeing Airplane Co.,** September. Pan American World Airways.

• **Glenn L. Martin Co.,** Informal conferences Eastern and Trans World Airlines.

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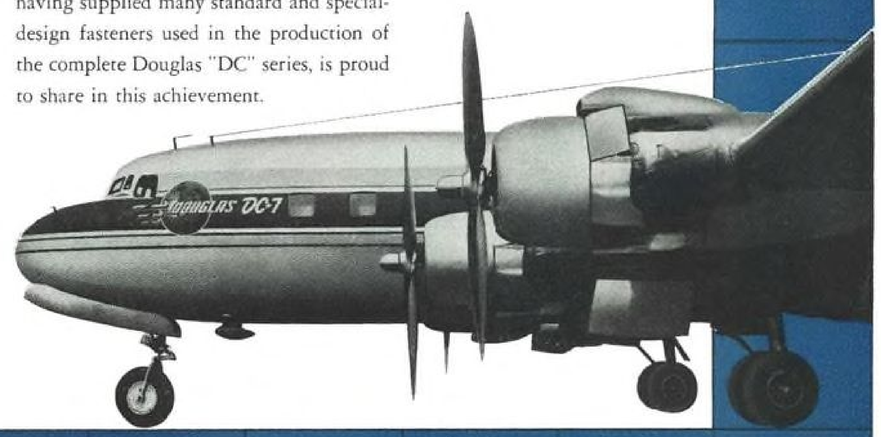

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is a major trend in present airline management.

On material control, ATA officials indicate that attempts to reduce inventory were frustrated by the requirement of long lead-time orders during the Korean war. But airlines expect more substantial progress in the future.

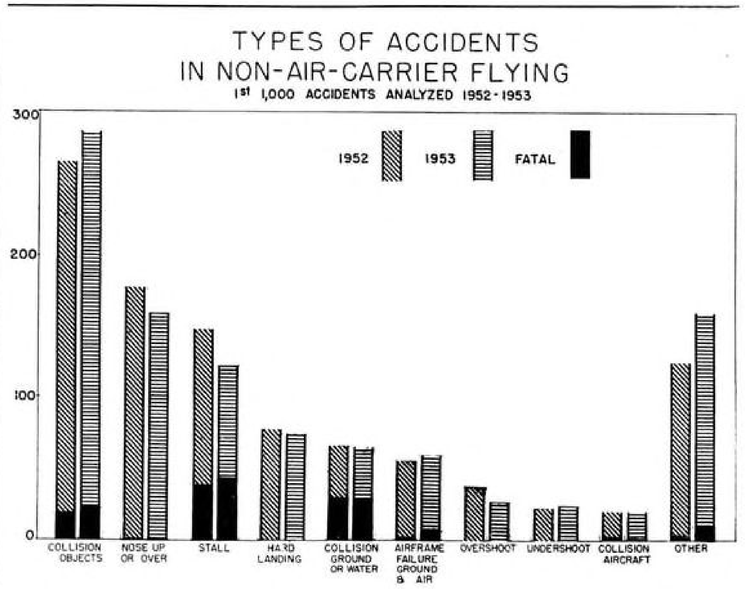
A report by the ground equipment subcommittee described standardization as impractical. Airline purchasing officers urge such a move, but on-the-spot maintenance men say such a program would be filled with problems.

Detailed equipment problems will be discussed at a special meeting.

Conferees debated setting up more special meetings in addition to those already scheduled. A proposed meeting to discuss aircraft exterior cleaning was voted down. Proposal of a meeting for standardization of manufacturer and vendor maintenance manuals and parts catalogs received a mixed reaction and was tabled until next year.

Air Power Show

Largest aerial show in the history of San Diego will be held Nov. 22 to mark the 50th anniversary of powered flight. Air Power Day demonstrations will include: USAF's FICON system of launching and recovering a YRF-84F from an RB-36D (AVIATION WEEK Aug. 31, p. 13); aerial refueling of a B-47 by a KC-97 tanker; an F-86 flyby, and an aerobatic exhibition by Navy's Blue Angels.



Stalls Lead Non-Airline Crash Toll

Stalls still lead the fatal non-airline accident toll, and flying into the ground or sea ranks second. Most numerous, but less fatal, are inflight and training collisions.

These are chief findings of a Civil Aeronautics Board analysis of 1,000 accidents this year and in 1952.

By type of operation, pleasure flying has the highest number of fatal and non-fatal accidents. In all types of flying, there is little change in the toll from 1952 to 1953.

Tally of accidents by type of flying breaks down as follows:

- **Instruction:** dual, four fatal, 43 total; solo, 13 fatal, 181 total.
- **Non-commercial:** pleasure, 54 fatal, 454 total; personal transport, 13 fatal, 108 total; executive, three fatal, 22 total; other, seven fatal, 56 total.
- **Commercial:** passenger, one fatal, 16 total; cargo, two fatal, eight total; crop control, two fatal, eight total; other, four fatal, 16 total.
- **Government:** federal, none fatal, seven total; state, none fatal, two total; municipal, no accidents.
- All other civil: 13 fatal, 28 total.
- All civil accidents: 117 fatal, 1,000 total.

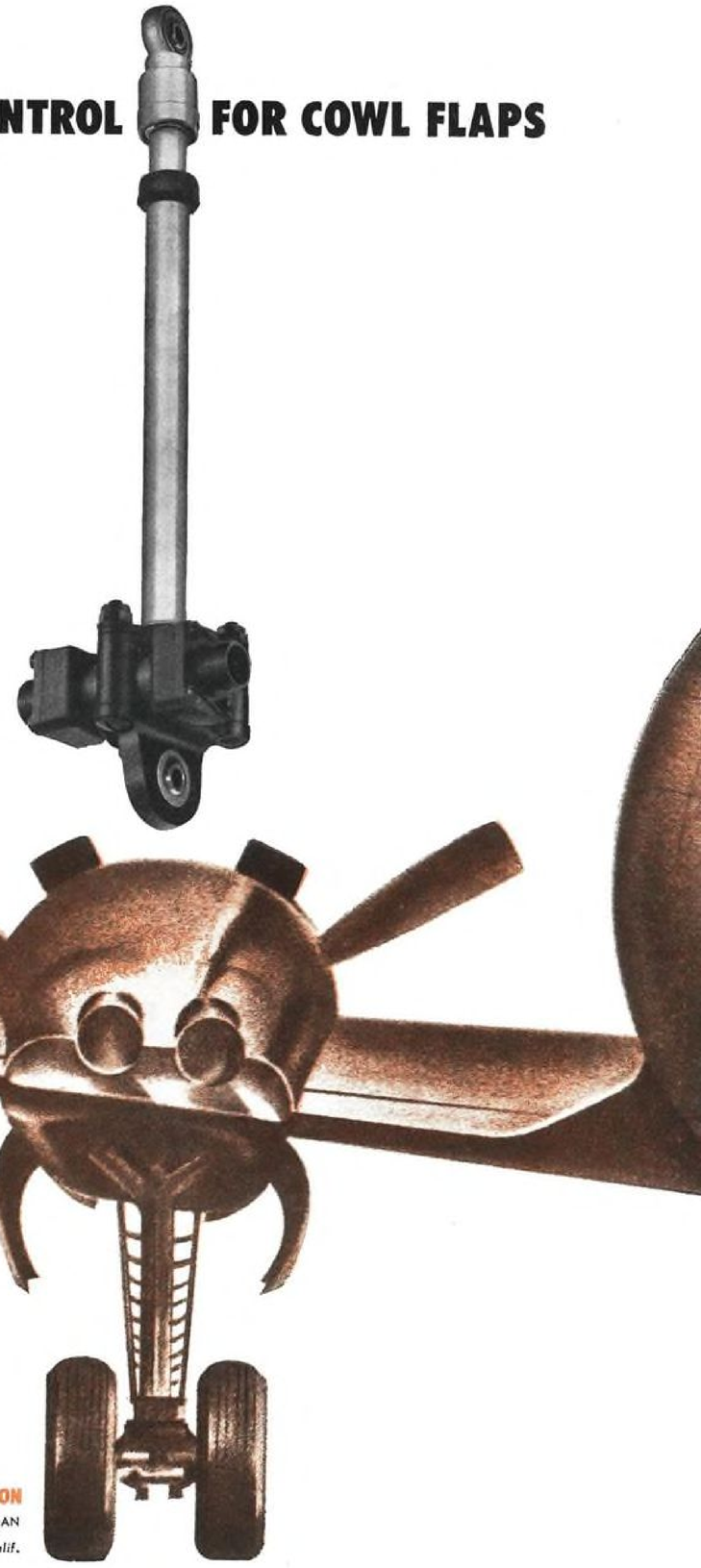
Fatal non-airline accident tally among the group analyzed for 1953: stalls, 46; ground collisions, 30; collisions with objects, 23; mid-air collisions, one; "buzzing or flathatting," 13; other reckless flying, 27; landing approach, 17; takeoff and climb, 17; normal flight, 51.

In these fatal accidents, 106 pilots, seven crewmen and 95 passengers were killed.

LEAR GIVES SURE CONTROL FOR COWL FLAPS ON CONVAIR 340

TO MATCH its exceptional ability to "get up and go," the versatile Convair Liner 340 needs precision control of its engine cowl flaps. Positive action and exact positioning for this important function are provided by Lear screwjacks.

Lear screwjacks form but one part of a comprehensive line of Lear electro-mechanical actuating products for aircraft use. Their compact design, light weight, high strength, and precision operation spell out the reasons for the use of Lear electro-mechanical products on almost every commercial and military aircraft flying today. Let us discuss *your* electro-mechanical problems. We will either have the answers on hand or be able to develop them quickly.



LEAR MODEL 550 SCREWJACK *(shown above)*
Combines with three similar units to complete a positive, non-reversing engine cowl flap control system for the Convair 340. The entire assembly is actuated by a common power source through a Lear system of flexible shafting, which can be utilized to transmit power to additional accessories.

EM-4

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Aviation Fuel Consumption*

The following projection of aviation fuel consumption through 1956 was compiled by an oil company official to show that the next three years will see a switch in demand from avgas to turbine fuel.

(Millions of barrels)

Year	Turbine Fuel	Avgas
1952	29	85
1953	55	98
1954	84	104
1955	100	109
1956	112	110

**Figures cover worldwide civil and military consumption, except "iron curtain" countries.*

Italy's Foreign-Backed Airlines Draw Fire

(McGraw-Hill World News)

Rome—A spokesman for Italy's majority Democratic-Christian Party has asked the Chamber of Deputies to force foreign capital out of Linee Aeree Italiane (LAI), financed by Trans World Airlines, and British-backed Aerolinee Italiane Internazionali (Alitalia).

Aviation authorities here support the deputy's demand, pointing out the Ministry of Defense is holding up a plan for strengthening civil aviation in Italy because its benefits would be shared by carriers with capital held to a large extent by foreign hands. TWA owns 40% of LAI (AVIATION WEEK Aug. 10, p. 58), and Alitalia is financed in part by British European Airways.

▶**Appendage Lines**—Deputy Giuseppe Veronesi says the U. S. and British airlines look upon the Italian carrier as appendages of TWA and BEA.

In both LAI and Alitalia, he claims, measures are not approved by a majority of directors but by votes representing two-thirds of the capital—enabling the foreign carriers to hold up any decision.

The deputy charges the two air transport companies were formed under by-products of the peace treaty and infringe on Italy's law, which requires firms formed with mixed capital to elect a board of directors of two-thirds Italian membership.

▶**$50-Million Program**—Aviation sources report the Ministry of Defense will ask the government for $50 million to strengthen civil aviation in this country as soon as foreign participation in LAI and Alitalia is settled.

The three-year plan calls for modernization of airports and airways services, expansion of domestic routes, and development of Italian transports.

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For temperatures up to 1000°F or more; with chromel alumel thermocouples, both stagnation type (illustrated) and open-end; quick-coupling lock-up connectors are completely enclosed, have flexible leads; harness is ceramic insulated and stainless steel jacketed.

The rigid harness above is an example of Thermo Electric's excellent design. Whether you need rigid harnesses, or flexible, or rigid with flexible connections, we can engineer them to meet your individual needs.

We handle all phases of design and production in our own plant and thus maintain uniformly high quality, not only on harnesses and thermocouples, but extension wires and accessories as well.

Get in touch with us. Let us help you solve your harness or thermocouple problems.

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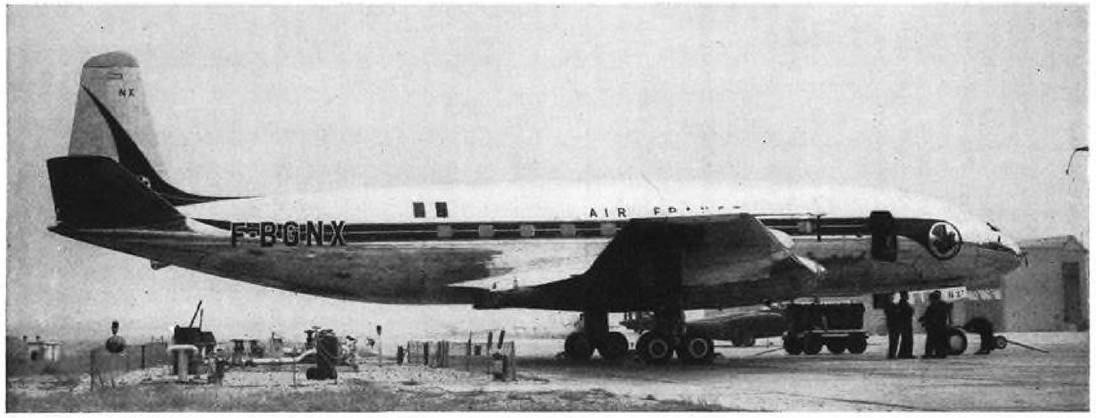
FAIR LAWN NEW JERSEY

COMET MOVES ACROSS apron, showing characteristic low-dihedral wing. White-topped cabin is trimmed with blue markings.



COMET STANDS ON THE APRON at Le Bourget Airport; this is the base for Air France's new fleet of jet transports.

First-year Report on . . .

How Air France Comet Training Works

By David A. Anderton

Paris—The integration of turbojet and turboprop transport operations with those of a piston-engined fleet is now being completed by Air France, operators of the world's largest airline route and proud owners of de Havilland Comets and Vickers Viscounts.

With three Comet 1As now in service from Paris to Beirut, Cairo and Algiers, and the same number of Viscounts on Continental runs, the French airline has progressed from first familiarization to routine operation in less than one year.

The extent of their Comet program for operations and maintenance, at the end of the first year, was told exclusively to AVIATION WEEK recently at the Paris headquarters of the airline and at Le Bourget Airport, its Comet base.

► **Fleet Size**—Air France purchased three Comet 1As (standard Ghost-powered airframe with 44-passenger capacity) and has an option on three Comet 2s (Avon-powered 44-seater) aircraft for delivery in 1954.

Six Viscounts will be delivered before the end of this year, and six more will follow next year. At the time of AVIATION WEEK's recent visit to Vickers' Weybridge plant, the sixth Viscount was nearing completion on the production line.

The services that Air France is running now are to buy routine operational experience with the new planes. While the planes are making two or three runs per week on the trial routes, additional routes are being studied—in the light of continuing increase in experience—for future applications of the turbine transports.

Cooperative exchanges of information with British Overseas Airways Corp. on Comet experience has helped both carriers in present day-to-day utilization and future planning.

► **Operations**—Marcel Faure, assistant head of operations, said that a special group had been sent out to survey the topography of runways on the routes that Air France would be flying with Comets. The information the group collected on runway characteristics, clear approaches, runway slopes, crosswind frequencies and intensities, and the like was analyzed and incorporated into a data handbook for the training of the crews.

Further information had been obtained from BOAC on runways, and in turn, Air France had handed over its runway data to the British carrier.

Cruise control had come in for considerable study, again on an interchange basis. Very complete manuals for cruise control have been developed by the operations group and are used by Comet crews.

Michel Philippart, Comet operations engineer, said that the work of the special Comet operations group began in September 1952, and that one of the jobs was the preparation of a conventional manual on the dimensional and performance characteristics the airplane.

Primary source for the data was de Havilland, and much additional material came from BOAC.

► **Maintenance**—Comet unit maintenance is done at Le Bourget, which has runways of sufficient length to handle the jet transport. A new runway is being

Air France Training Program For Comet Pilots

• **Period 1/A:**
A) Ground instruction, including:
1) Preflight inspection and checklist.
2) Location and use of safety equipment.
3) Internal and external inspection.
4) Familiarization with equipment locations.
5) Starting the engines.
B) Familiarization with the radio.

• **Period 1:**
A) Taxiing, including use of brakes and nosewheel steering. Checklist before takeoff.
B) Takeoff and landing.
C) Work in the air:
1) Approaches at reduced speed, in straight lines and turns, at weight above the maximum landing weight.
A) The same, with throttled engines.
B) Full flaps, landing gear down, throttled engines.
C) 15-deg. flaps, landing gear extended, climb condition.
D) Full flaps, landing gear down, 30-deg. turn in cruise condition.
2) Climb to 38,000-40,000 ft., maintaining correct indicated airspeed, and use of the Machmeter.
3) Climbing turns.
4) Level flight and turns at altitude.
5) Compensation in cruising.
6) Emergency operation of hydraulics. Emergency operations in case of fuselage fire.
7) Use of automatic pilot and limit switches.
8) Use of pilot's radio.
9) Use of fuel cutoffs.
10) Use of automatic trim.
11) Effects of compressibility at 0.81 Mach above 35,000 ft.
12) Use of airbrakes at high Mach numbers.
13) Normal descent at 220 knots.
14) Turns at 2G.
15) Normal descent with airbrakes.
16) Emergency descent at 250 knots.
17) Effects of airbrakes with 15-deg. flap deflection.
18) Asymmetric flight in turns with two and three engines.

• **Period 2 (light weight):**
A) Fuel shutoff for four engines.
B) Landing with four engines operating.
C) Engine failure on takeoff.
D) Fuel shutoff on three engines.
E) Landing on three engines.
F) Failure of two engines on takeoff.
G) Landing on two engines.
H) Landing without flaps.
I) Relighting engines in flight.

• **Period 3 (increased weight):**
A) Fuel shutoff on four engines.
B) Landing on four engines.
C) Failure of engine on takeoff.
D) Fuel shutoff on three engines.
E) Landing on three engines.
F) Failure of two engines on takeoff.
G) Landing on two engines.

• **Period 4 (at night, light weight):**
A) Fuel shutoff on four engines.
B) Landing on four engines.
C) Failure of engine on takeoff.
D) Fuel shutoff on three engines.
E) Landing on three engines.
F) Failure of one engine on a three-engine takeoff.
G) Landing on two engines.

• **Period 5 (at night, increased weight):** same as Period 3.

• **Period 6:**
A) Flight on basic instruments in turns at different rates.
B) Use of ADF equipment.
C) Use of radio range equipment.
D) Use of the instrument landing system.
E) Landing procedure.
F) Maneuvers in case of fire and/or hydraulic failure during instrument flight.

• **Period 7: (Co-pilot only)**
A) Takeoff and landing from the right seat.

• **Period 7:** (co-pilot only)
A) Oral familiarization with the work of the co-pilot and the correct use of checklists.

• **Period 8:**
A) General familiarization with the radio.

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➡ Do Not Require Closely Regulated Power Supply

➡ No Heating Required Over Entire AN Range

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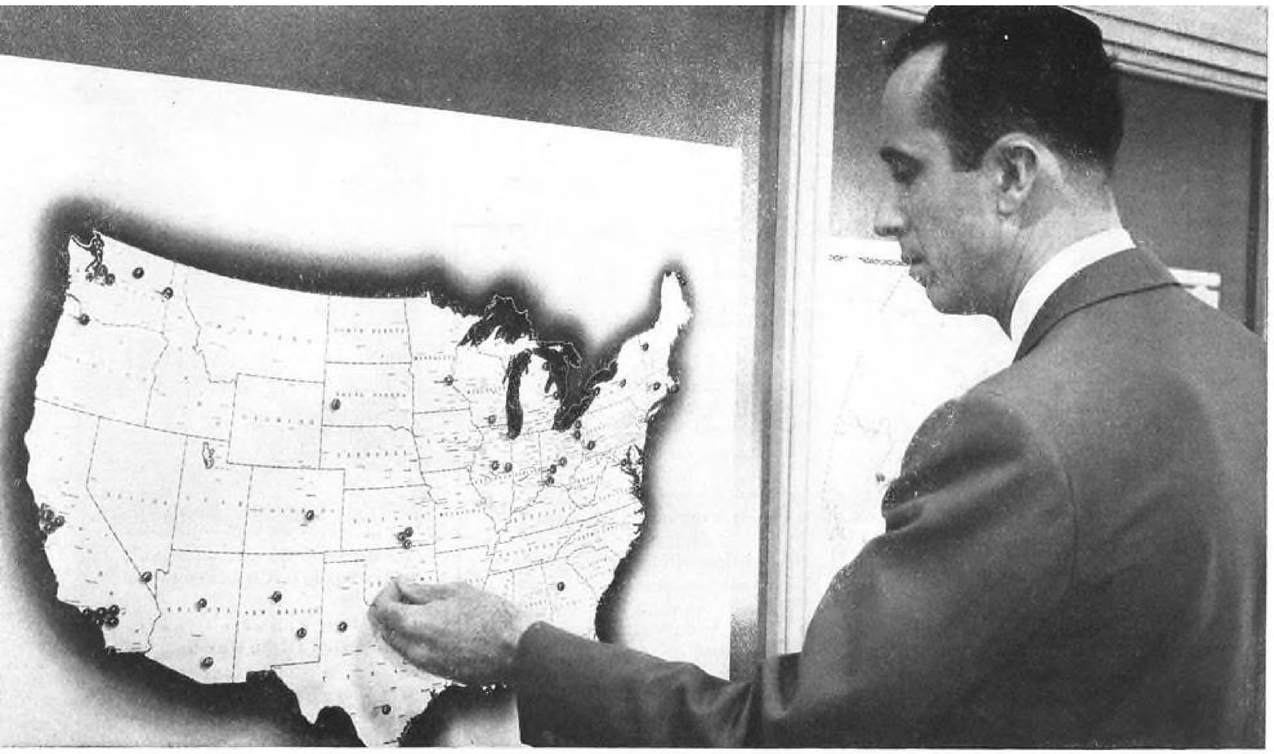
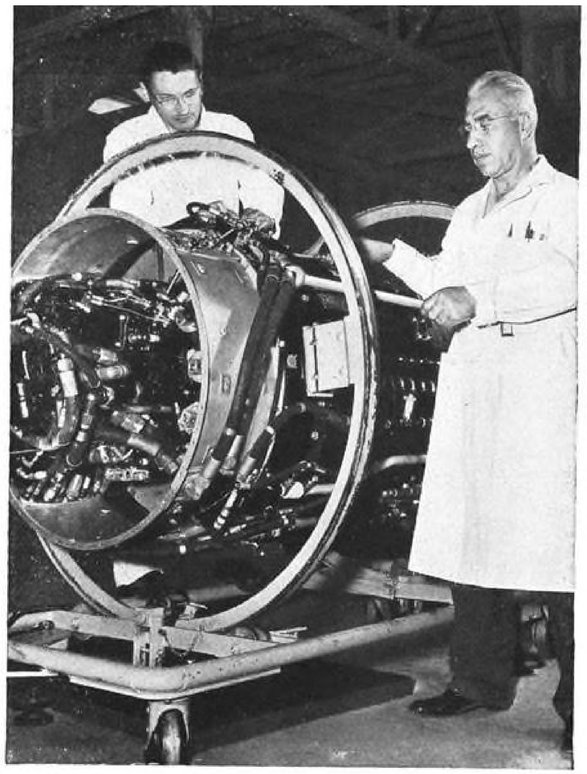


HOME BASE OF G.E.'S far-flung jet service organization is at General Electric's Evendale plant near Cincinnati, Ohio. Tech reps at 65 key operational centers comprise a service network that brings G-E engineering within easy reach of G-E jet engine users.

How General Electric maintains peak turbojet performance in the U. S.



G-E SERVICE SHOPS at Los Angeles and Strother Field, Kansas, modify G-E jet engines coming from points in the United States.

AIRFRAME MANUFACTURER'S personnel are instructed by G-E tech reps on maintenance and operation of G-E jet engines.

Coast-to-coast Service Brings G-E Jet Engineering Into Field At 65 Key Locations

Highly trained G-E "trouble-shooters" provide engineering assistance at USAF bases, airframe manufacturers' plants, USAF overhaul bases, G-E service shops, and special experimental test locations. Not only do these technical representatives assist in the solution of engineering problems in the field, they do much to help improve jet engines still in the factory.

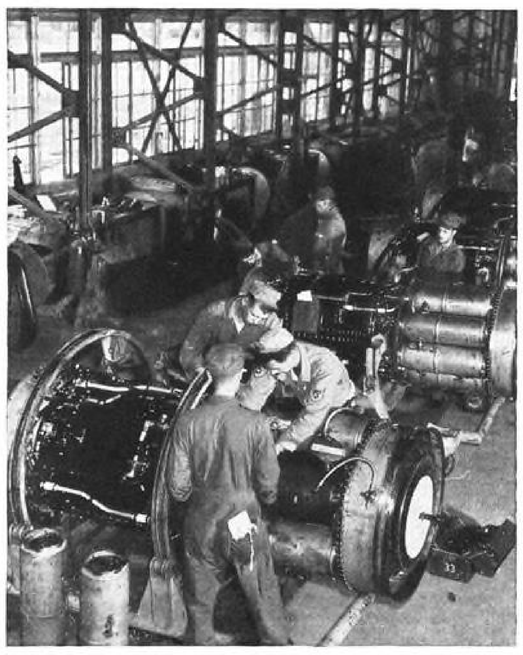
Coast-to-coast and throughout the entire world, G-E jet engines are assured top performance at all times. In Korea, England, Germany, Puerto Rico, Alaska, Greenland, Iceland, France, as well as the United States, G.E.'s jet service engineering organization is on the spot to make sure G-E turbojets are performing properly. In the United States alone, 65 key locations are brought within easy reach of G-E engineering by a nation-wide service network.

In addition to instructing USAF and airframe manufacturers' personnel on maintenance and parts ordering, tech reps submit technical reports on in-service jet engines to factory engineers. These reports are carefully studied by development engineers and often result in design changes. Many of the improvements in the J47 can be attributed to observations of G-E technical representatives in the field.

Following through on jet engines after they have left the plant means that no matter where a G-E jet engine goes, General Electric engineering goes with it. This is added assurance to users of G-E turbojets of optimum performance throughout the life of the engine. 230-12

SPECIAL TEST LOCATIONS provide means for G-E tech reps to record engine performance under severe conditions.

USAF REPRESENTATIVES co-ordinate with G-E technical representatives in seeking new ways to improve performance of G-E turbojets.



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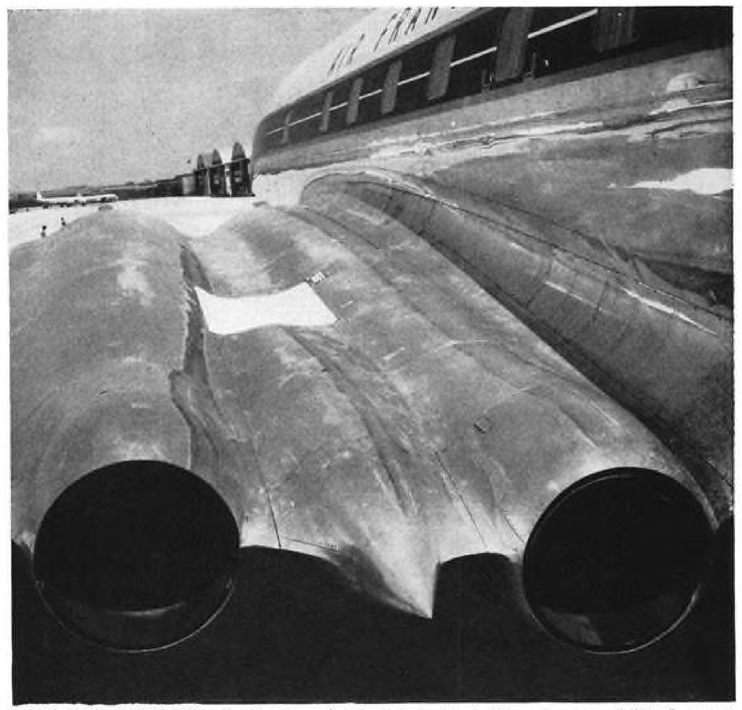

DOUBLE-BARRELED exhaust pipes of Ghost turbojets in Comet surround faired mounting for assist takeoff rocket unit, now abandoned by manufacturer and user alike. White patch on upper surface is location of life raft.

built at Orly, but completion is some months away.

Maintenance of the Comet, said one engineer, has not required any special tools nor posed any special problems. He added that for that reason, the Comet hangar would look just like any other maintenance hangar.

There were two interesting sidelights in the shop. The first was that there seemed to be no lack of accessibility to the engine compartment with its "buried" Ghost engines, although this is a favorite argument of the pod proponents. With the plane in a static position, it was possible to reach the lower portions of the engine. A low stool would have made accessibility easy up to the engine centerline.

The second sidelight: All stenciled markings on the Comet were in English; on the Air France Lockheed Super-Constellations, all such markings are in French.

Engine maintenance is routine; overhaul is currently done at the 450-hr. mark, and is to be extended soon to the 600-hr. level. Current practice is to send engines back to the DH factory for overhaul. In the near future, overhaul of the Ghost engines will take place at Air France's engine shops at Courbevoie near Paris.

► **Flight Training**—Comet crews began their training in December 1952 with a program about three times as involved as that required to train a Connie or DC-4 pilot for operations.

Two crews had made familiarization trips over BOAC routes with the British airline, and had received instruction in England. Part of their program was a complete seven-week ground school course at the de Havilland factory, and two months of flight training under the tutelage of DH pilots. Meantime radio operators and navigators were going through the BOAC ground school.

After the first two crews had been through the "British" phases of their program, they returned to start off the other crews in a comprehensive program of their own.

The training includes about 10 to 12 hours of local flights, during which the pilots get the feel of the airplane under various conditions of aerodynamic configuration and power. After this, they fly the Comets over current routes for inflight training in cruise and approach procedures, use of radio and navigational aids, and integrated crew work.

► **Handling Characteristics**—According to Capts. Andre Chaume and Rene Tournadre, chief and asst. chief pilots for Air France's Comet unit, the Comet has no vicious characteristics at all. There is plenty of stall warning before the airplane drops out into a gentle, easily controlled stall with no tendency to fall off on a wing.

The airplane has a tendency to pitch

ESCAPE

Here is a record of performance no other type of parachute has ever delivered.

An ejection seat with a 400 pound load equipped with a Pioneer P7-B parachute was catapulted from a jet plane flying at a speed of 600 miles per hour at a 200 foot altitude. The parachute was fully opened and in normal rate of descent 150 feet above the ground.

This is but one of hundreds of tests, under the most difficult circumstances, which have proved the performance superiority of the new PIONEER GUIDE SURFACE PERSONNEL PARACHUTES.

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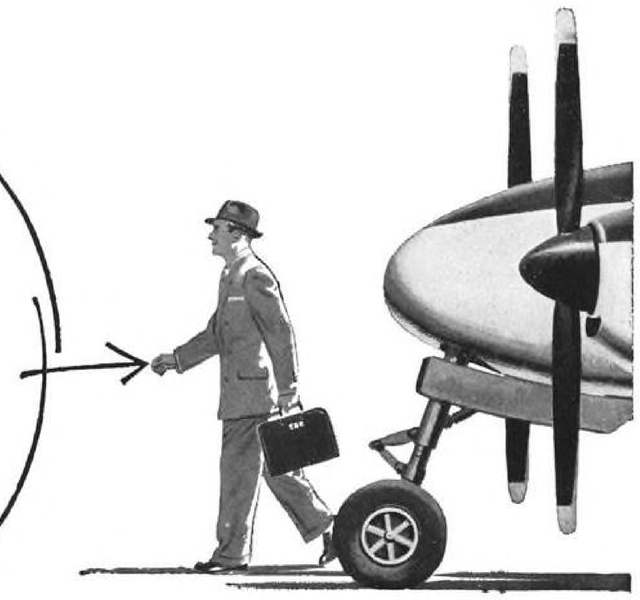
To the **PRIVATE** plane owner:



A spark plug, too, is known by the company it keeps!

You, as a private plane owner, can make a simple test to determine the best spark plug. Ask: "*Who uses them?*"

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—Every major domestic scheduled airline.

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It is this tremendous popularity, and the great production volume that it permits, that enable Champion to maintain extremely low prices on top quality spark plugs.

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up near its critical Mach number, and the pilots fly closely enough to that value during one phase of their training to appreciate the sensation Mach numbers of 0.77 in climbs, and 0.81 in dives are flown during the program.

► **Criticisms**—Critics of the Comet—or of jet transports in general—have cited three specific complaints:

• **Takeoff procedure** becomes a critical problem too easily.

• **Landing on a wet or icy runway** could be difficult because of the lack of reverse thrust.

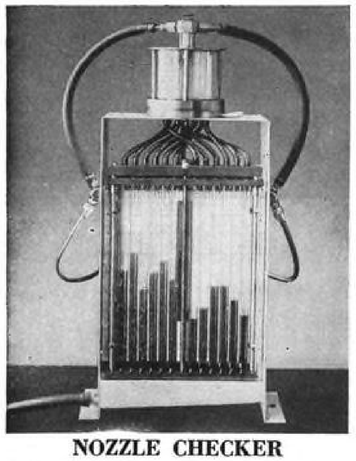
• **There is a lack of "feel"** transmitted to the pilot through the control column during flight in turbulent air.

► **Answers**—Chaume and Tournadre gave these answers to the three items:

• **Part of the training program** for Comet units—British and French—includes simulated "critical" takeoffs to initiate the pilots. Air France training also includes a stalled takeoff; the airplane is pulled to a stalled attitude as soon as possible during the takeoff run. This is held only long enough to stabilize the airspeed and to prove to the new pilot that the plane won't take off under such a condition.

Chaume stated that it takes a lot of strength to pull the stick all the way back and hold it back during a takeoff. This "stall-warning" characteristic was an excellent reminder, he believed.

In addition to this training procedure, takeoff calculations have been made for every runway on the Comet routes for all foreseeable conditions of wind, weather and weight. These calculations have been worked into chart form and

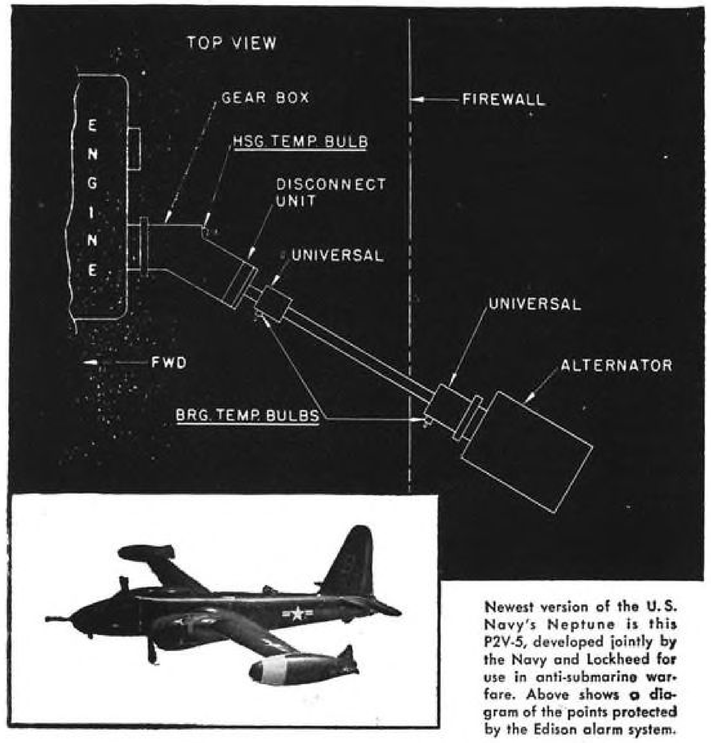


NOZZLE CHECKER

Designed to measure nozzle spray dispersion in jet and diesel engines, this portable device operates by dividing and channeling segments of spray into glass columns for dispersion and atomization checks. Nozzle is placed in glass cage at top and attached to flow source. Called the Patternator, unit is manufactured by Jet-Heet, Inc., Englewood, N. J.

Lockheed Neptune Gets New

Temperature Warning System



Newest version of the U. S. Navy's Neptune is this P2V-5, developed jointly by the Navy and Lockheed for use in anti-submarine warfare. Above shows a diagram of the points protected by the Edison alarm system.

A NEW EDISON Temperature Alarm System keeps its sensitive "fingers" on three spots in the alternator drive system. Should the temperature at any or all spots rise to 150°C, an alarm automatically signals in the flight compartment. The alternator drive system is so designed that it can be immediately disengaged before serious damage can happen.

THREE STANDARD resistance bulbs, a small control assembly (wgt. 1.5 lbs.), and a panel light make up the system. The bulbs are installed as shown in the diagram. Each bulb continuously "feels" the temperature at each point. When the temperature reaches its critical level, the alarm comes on, and, if the temperature returns to normal, automatically shuts off.

THE SYSTEM can be adapted to any number of circuits and still retains its basic simplicity. For information concerning specific applications, write to—

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Westinghouse J40 powers F4D to world speed record

U.S. Navy establishes mark of 753.4 mph

A Westinghouse J40 turbojet powered the Douglas F4D "Skyray" to a new high speed of 761.414 mph as it recaptured the world speed record for the United States by streaking to an official average of 753.4 mph over the required course.

Designed and manufactured by the Westinghouse Aviation Gas Turbine Division in South Philadelphia, Pa., the J40 and other outstanding turbojets now are being produced at the huge Westinghouse jet engine plant in Kansas City, Mo.

This J40 contribution to record-breaking jet progress is another example of Westinghouse turbojet leadership. Westinghouse Electric Corporation, Aviation Gas Turbine Division, Lester Branch P. O., Philadelphia 13, Pa.

J-54032

YOU CAN BE SURE... IF IT'S
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A technical ground crew monitors the F4D flight by recording four individual passes over a three-kilometer course.

Official representatives check film of individual passes to determine average speed attained by the Douglas F4D.

LCDR James B. Verdin returns after piloting Westinghouse-powered F4D to record-shattering runs of 746.075, 761.414, 746.053 and 759.499 mph.

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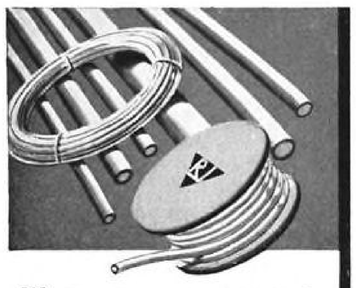

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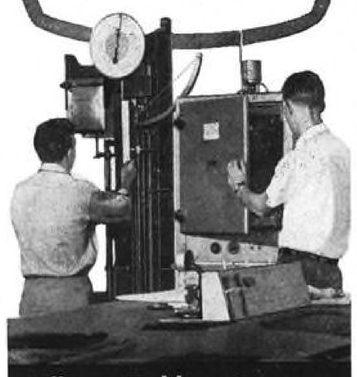


Stillman Rubber Company
5811 MARILYN AVENUE, CULVER CITY, CALIFORNIA

are included in the pilots' handbook.

Another takeoff aid is in the works, according to the pilots. A Zero Reader system is being developed by the Sperry Gyroscope Co., Ltd., with the cooperation of the de Havilland people; it will present the pilot with a visual and precise indication of angle of attack during the takeoff run.

• **Landing on a slippery surface** should pose no particular problems, according to the Air France pilot-instructors. Their Comets have Maxaret brakes which allow a wheel to rotate as soon as a skid begins, even though the brakes are full-on. This avoids the locked-wheel skid tendency of conventional braking systems.

A jet deviator, although not yet fully developed, was also mentioned by Chaume and Tournadre as a possibility. They commented that the drag of the airplane itself could be useful in shortening the landing run. Below 90 knots it is still possible to keep the nose high, which of course is a high-drag attitude. This will add to the decelerating force on the airplane, and is as almost as effective as braking, the pilots say.

• **The question of control feel** or feedback in turbulence was flatly answered by Chaume and Tournadre. Both pilots were in agreement with the BOAC fleet in stating that they felt no need for such a feedback.

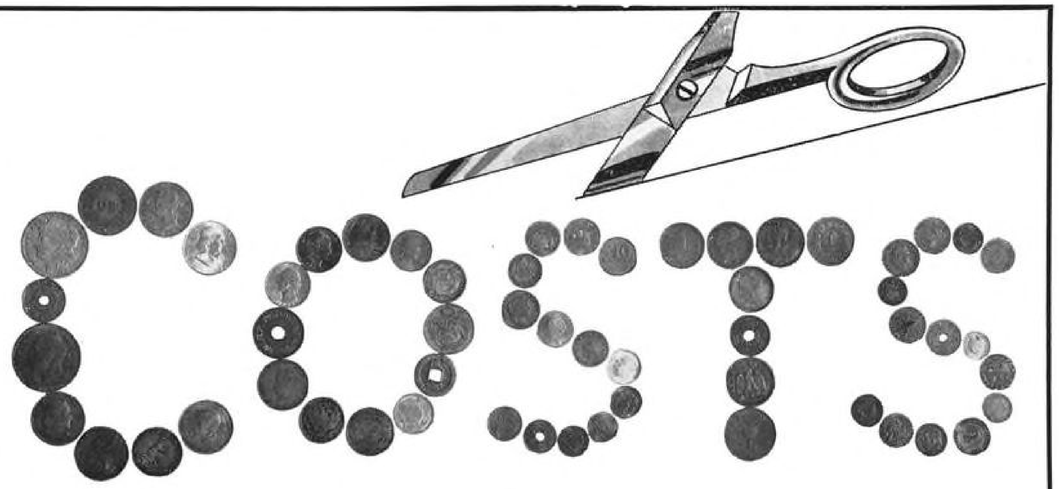
They also emphasized the fact that there is a definite stick force on the Comet due to the spring capsule in the control column; this force is felt as stick deflections increase to large values. It is not to be confused with the small transient control deflections caused by atmospheric turbulence which cannot be felt through the Comet system as it now is built.

Wright Group Plans To Rebuild Kitty Hawk

A project to recreate the site of the Wright Brothers historic first flight exactly as it existed in 1903 has been undertaken by the Kill Devil Hills Society, National Park Service, Air Force Assn. and the North Carolina 50th Anniversary of Powered Flight Assn.

The group is seeking $25,000 to rebuild and re-equip the Wrights' hangar, workshop, living quarters and the 60-ft. wooden monorail used for the first flights. The completed site will be unveiled Dec. 14 at the start of a four-day tribute to the Wright Brothers at Kill Devil Hill.

Contributions can be sent to the Kill Devil Hills Memorial Society, 500 Walker Building, Washington 5, D.C. Envelope should be marked "National Park Service—Wright Memorial." A list of all contributors will be displayed at the site.



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Enclosed find brief outline of my metal problem. Without obligation rush me your suggested solution.

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GLIDE TESTS of Lodestar by Lear, Inc., evaluate modifications made in airplane configuration to reduce drag. Cruising speed has been boosted from 250 to 300 mph. without cost in power or fuel consumption by application of analytical method to glide test data.

Tests Help Boost Lodestar Speed

The engineering technique that helped set a world's distance record for sailplanes has boosted the cruising speed of a special Lockheed-built, Lear-modified Lodestar by 50 mph.

Basic aerodynamic data obtained in power-on and power-off flights have been analyzed in a technique originally developed for sailplane research by Dr. August Raspet, head of the Aerophysics Dept. at Mississippi State College. The results of such flight tests indicate prospective areas for investigation of drag reduction.

Using the technique, Raspet—who has been retained by Lear, Inc., to guide the performance phase of Lodestar modifications—has upped the Lear executive craft's cruise speed from 250 to 300 mph., at no cost in fuel or power.

This program is the first application of Raspet's method to powered aircraft. In earlier work with the RJ-5 sailplane, the glide ratio was improved from a value of 30 to a value of 40. R. H. Johnson, who developed the sailplane at Mississippi State, used the craft in its final form to set a world's distance record of 535 miles.

► **Behind the Analysis**—The basis of the new method is to use the sky as a windtunnel. Raspet says that even if full-scale tunnel tests could be performed on the Lodestar—and they couldn't because there isn't any tunnel large enough—such tests would be of doubtful value because of interference and tunnel wall effects. Furthermore, the cost would be very large.

Flight tests were the alternate approach. Some years back, a group of personal airplanes with props removed had been tested at Mississippi State by towing them to 10,000 ft. Sinking speed measurements were made in the glide after release, and from these data overall propulsive efficiencies were computed.

In the Lear tests, research pilot Ed Swearingen climbs the Lodestar to 20,000 ft., cuts the engines, feathers the propellers and glides to 10,000 ft. At that altitude, the engines are started again, and the climb and glide are repeated.

Engine brake horsepower is measured by a torquemeter during powered flight, and compared with the thrust horsepower determined in the glide. The ratio of THP (available)/BHP (required) determines overall propulsive efficiency. Working backwards from required power will also define the true drag coefficient of the airplane.

The method can be derived from performance theory; Richard von Mises' "Theory of Flight" gives such a presentation.

► **Working With Data**—The combination of these flight test data and photos taken of the tuft patterns on wings permits a diagnosis of the airplane's failings. Modification follows; then a succeeding series of flight tests is run, aimed at evaluating the modifications.

Example: On the Lodestar, a new cowling—designed by Gordon Israel, chief engineer of Lear's aircraft division—has already reduced drag considerably. The cowling has been evaluated as an improvement by these flight tests. By continued series of tests, the drag-reduction value of each change in configuration can be found and assessed in terms of the cost of the change.

Aircraft Industry Is California's Largest

Los Angeles—Impact of the aircraft industry on the nation's economy is spelled out in detail in a survey by Aircraft Industries Assn.

Los Angeles, center of the industry, was chosen for the association's survey.

Aircraft now is the second largest manufacturing industry in the U. S. Aircraft and parts form the largest manufacturing industry in the Los Angeles metropolitan area and in the entire state of California, the survey shows.

► **$760-Million Payroll**—In September 1953, nearly 162,000 persons were employed by six companies—Douglas, Hughes, Lockheed, North American, Northrop and AiResearch. With total manufacturing employment in the area at 647,000, this meant one of every four was working in aircraft and aircraft parts manufacture.

The AIA survey reports the six companies provided employment for more men and women in Los Angeles than the next three ranking industries combined.

What the aircraft payroll of $760 million a year means to the community was estimated by AIA. The total payroll of nearly $3 million a day was spent at a rate of $3.2 million a week for groceries and meats; $2.2 million for automobiles, fuel and service; $1.3 million for clothing; $1.2 million miscellaneous; $1.2 million for personal services, barbers, dry-cleaning, beauty shops; $850,000 for furniture and household appliances; $620,000 for lumber and building materials; $380,000 for entertainment and $300,000 for drugs and sundries.

► **476-Million Spending**—This amount poured into normal trade channels, says AIA, would support more than 8,000 retail stores; 8,000 doctors, dentists and assistants; nearly 2,000 service stations, hundreds of food markets, hardware stores, shoe shops, jewelers, accountants and lawyers.

More than 13,000 teachers were required to educate the children of aircraft industry employes.

The six firms surveyed are spending $476 million annually with local merchants and subcontractors for materials and services ranging from paper clips to complex avionics equipment.

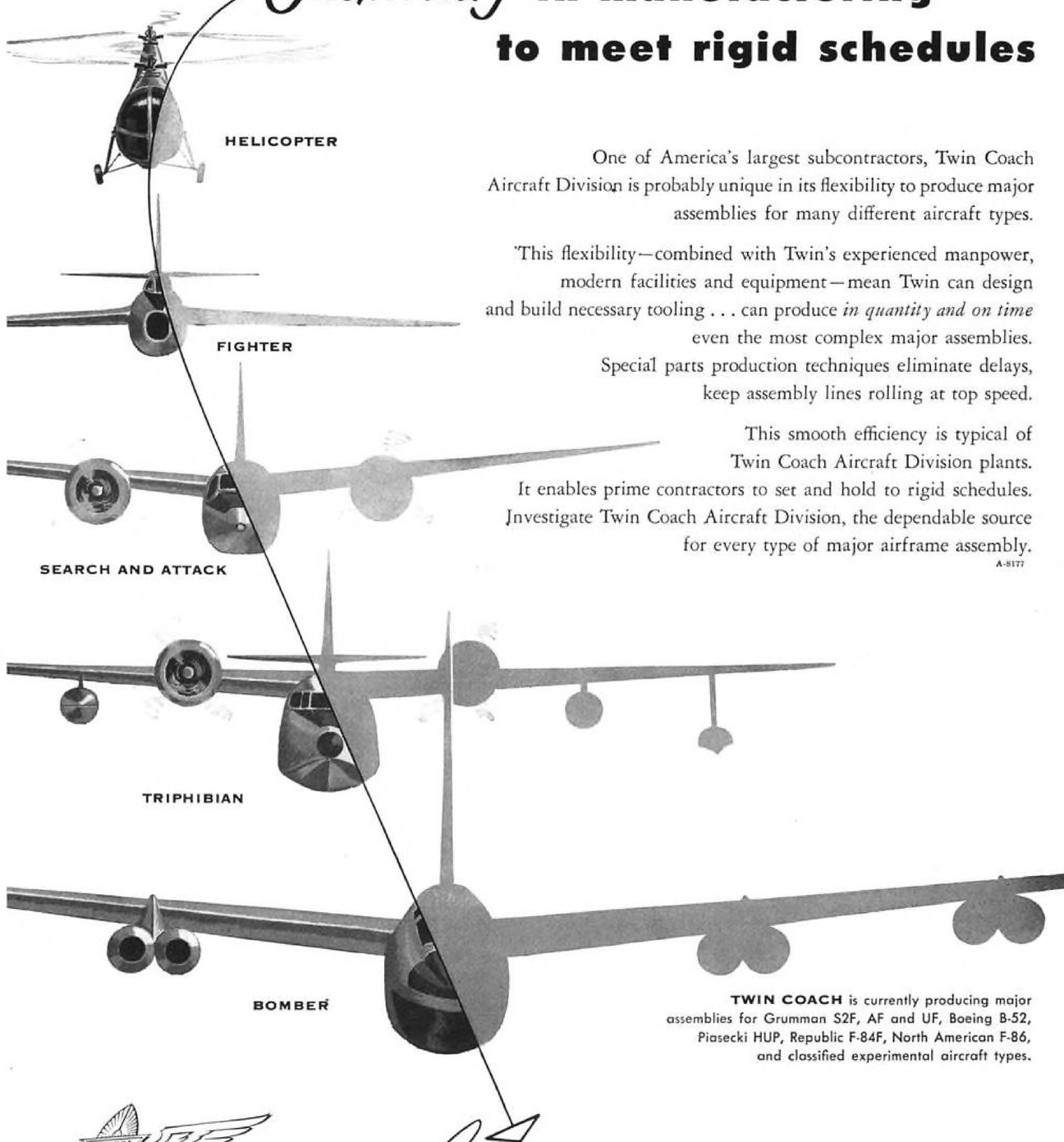
► **Concentrated Groupings**—Present backlog of the six companies is more than $5.8 billion—nearly as much as the total amount of money on deposit in metropolitan area banks. The amount they pay in local taxes is more than $13 million annually, AIA says.

Consolidated sales for these firms during fiscal 1953 amounted to almost $1.7 billion, more than the combined total of agriculture, petroleum, citrus and construction.

Summing up these impressive statistics, AIA concludes:

"In this metropolitan area is located one of the most concentrated groupings of aircraft industry anywhere in the world. This concentration has given rise to an unofficial but undisputed claim for Los Angeles as the air capital of the world."

Flexibility in manufacturing to meet rigid schedules



One of America's largest subcontractors, Twin Coach Aircraft Division is probably unique in its flexibility to produce major assemblies for many different aircraft types.

This flexibility—combined with Twin's experienced manpower, modern facilities and equipment—mean Twin can design and build necessary tooling . . . can produce *in quantity and on time* even the most complex major assemblies. Special parts production techniques eliminate delays, keep assembly lines rolling at top speed.

This smooth efficiency is typical of Twin Coach Aircraft Division plants. It enables prime contractors to set and hold to rigid schedules. Investigate Twin Coach Aircraft Division, the dependable source for every type of major airframe assembly.

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TWIN COACH is currently producing major assemblies for Grumman S2F, AF and UF, Boeing B-52, Piasecki HUP, Republic F-84F, North American F-86, and classified experimental aircraft types.

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FINANCIAL

1953 Market Action Of Airline Common Stocks

Company	1952 Close	1953 Range High	1953 Range Low	10/22/53 Close	Decrease or (Increase) From 1952 Close Amount	Decrease or (Increase) From 1952 Close Percent
American	$14.75	$15.375	$11.50	$12.125	$2.625	17.8%
Braniff	10.125	11.125	6.125	6.875	3.25	32.1
Capital	11.875	13.50	9.25	9.875	2.00	16.8
Colonial	12.625	14.50	10.25	13.375	(0.75)	(5.9)
Continental	7.50	8.875	6.625	7.25	0.25	3.3
Delta—C&S	29.25	32.25	21.00	22.75	6.50	22.2
Eastern	26.25	28.375	20.625	22.75	3.50	13.3
National	14.75	15.50	11.125	12.625	2.125	14.4
Northeast	4.125	4.75	2.75	3.00	1.125	27.3
Northwest	13.25	14.50	9.625	9.75	3.50	26.4
Pan American	9.625	11.625	8.25	8.75	0.875	9.1
TWA	17.875	20.125	12.75	13.625	4.125	23.1
United	29.50	32.25	21.875	23.375	6.125	20.8
Western	10.75	12.625	8.375	9.50	1.25	11.6

AVIATION WEEK compilation.

Why Have Airline Stocks Dropped?

Here are some of the reasons investors are playing hard-to-get, even though earnings approach new peak.

Despite favorable airline earnings last year, continuing well into 1953, equities of the group have experienced declining market tendencies.

The exclusive AVIATION WEEK compilation above of the market action of major airline common stocks spotlights these tendencies.

The general market, as measured by a popular composite stock index, is now down an average 10% from the 1952 year-end closings. Airline equities have declined all the way from 32.1% to as little as 3.3%. (By contrast, the stocks of a number of aircraft manufacturers showed a marked increase in the same period. See AVIATION WEEK Oct. 19, p. 49.)

►**Low Point**—Airline shares are now at about their lowest levels in some three years. This condition prevails despite the industry's all-time record earnings of 1952 which, on the average, may be equaled this year.

Only Colonial Airlines displays any increment in market price thus far this year. This gain, 5.9%, is due entirely to the company's pending acquisition by Eastern, recommended by a CAB examiner and now subject to White House approval.

Continental Airlines shows the smallest percentage decline of the group, being off only 3.3% from the 1952 year-end. A relatively limited market interest has evidently had a tendency to minimize price fluctuations in this issue.

The sharpest decline (32.1%) has been experienced by the common stock of Braniff Airways. The company has sustained heavy losses in its Latin American operations, which may be subject to adjustment in mail rate determinations. The acquisition of Mid-Continent has also been a factor in contributing to Braniff's losses.

While having the lowest unit market price, Northeast's common stock shows a substantial market loss of 27.3% during the year. Despite an excellent management operations record, NEA has not been able to overcome the public apathy to heavily subsidized carriers.

Among the Big Four, Eastern shows the best resistance to the decline, being down only 13.3%. The company's fine earnings record and, particularly, its known conservative accounting policies may have contributed to this.

►**No Premium**—One of the most significant developments in recent market price trends of the airlines is the availability of most trunk air carrier equities at discounts to their respective book

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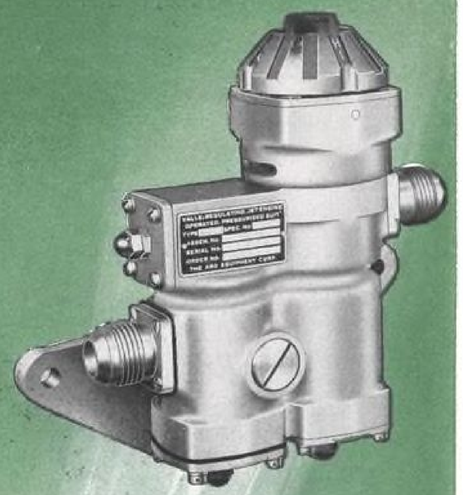

MODEL 10050
"ANTI-G" VALVE
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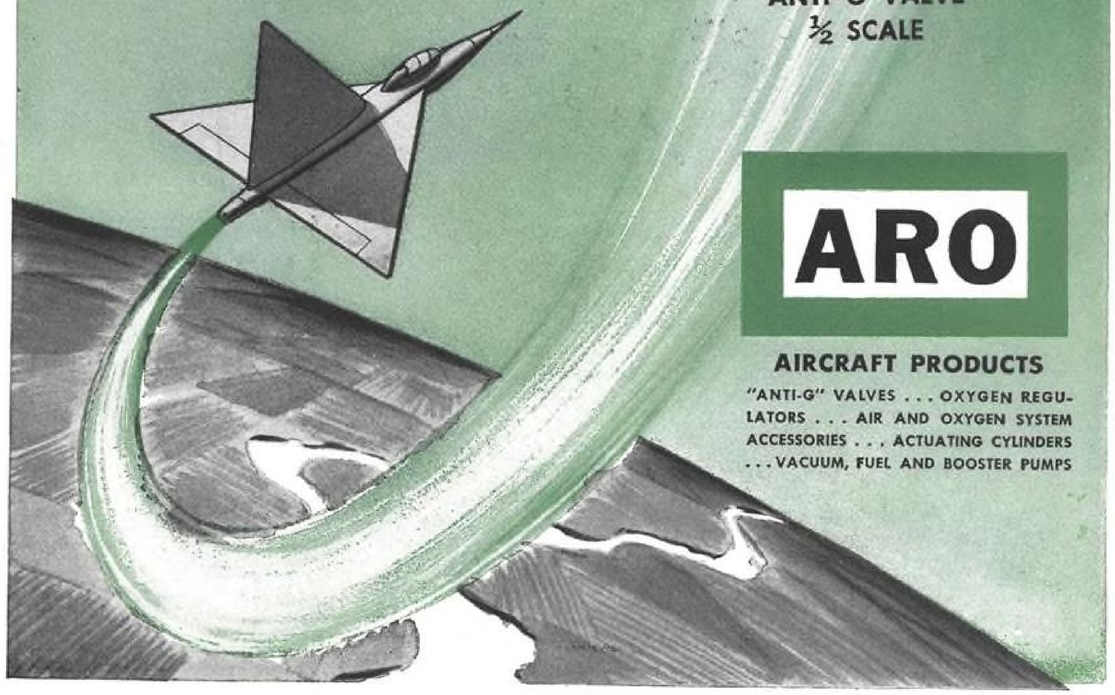

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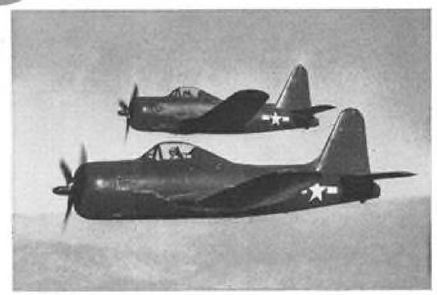
RYAN FLYING COMPANY, 1926



RYAN FR-1 FIREBALLS, 1944

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Today, Ryan's plant covers three-quarters of a million square feet of production area and 40 acres, and is staffed by more than 4,500 skilled aeronautical workers whose spirit and loyalty is extraordinary. It is this combination of skill, modern equipment and enthusiasm teamed with Ryan's versatile aviation experience that gives Ryan the edge in solving today's aircraft problems.

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values. In past years, most trunkline equities sold in the market at substantial premiums over book.

Only American's junior equity, with a current book value estimated at around $8.00 per share, commands a noteworthy market premium. The high degree of leverage inherent in the company's capitalization, together with a sustained earnings record, probably accounts for this condition. Eastern's common stock is currently estimated to have a book value approximating present market quotations.

Pan American's equity, with a book value of $16.07 at the 1952 year-end, shows the greatest discount from current market prices, about 46%.

► **Subsidy's Effect**—These disparities illustrate the over-riding influence that earnings and the potential profits outlook of each company have in determining the course of market prices. The nature and quality of earnings also come in for careful evaluations. In other words, earnings subject to subsidy elements are not always regarded as fully dependable. Further, while capital gains realized on the sale of property may bolster net worth positions, they are not given the same high regard which sustained earnings from normal operations get.

Nevertheless, airline equities of the major companies currently sell at low multiples of anticipated earnings for 1953. Equities of the leading carriers now sell at levels averaging from five to six times projected 1953 earnings. Historically, this is about the lowest that earnings have ever been evaluated for the airlines.

► **Other Factors**—But it is not difficult to find the basis for this relatively low evaluation. Shifting governmental policies confuse investors and give rise to many doubts as to stability in the industry. The highly marginal aspects of operations where rising costs and lowering unit revenues pose a real threat to earnings are not conducive to attracting potential investors.

The need for husbanding financial resources to acquire constantly growing facilities has made for limited dividend disbursements. This is not viewed favorably by many would-be investors.

All of these elements and the market quotations for airline equities in themselves clearly indicate that a decidedly speculative tone still underlies the air transport industry. The one healthy feature remains in the strong growth aspects of the industry, which promises to achieve new peaks in traffic and earnings.

But all this has to be converted into sustained and dependable earnings before airline equities may be regarded as quality investment caliber.

—Selig Altschul

Eclipse-Pioneer

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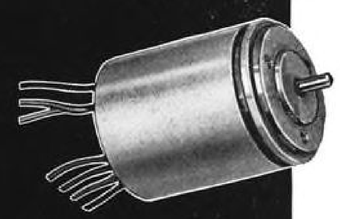
Transmitters	AY201S-26	26V, 400~, 1 ph.	125	0.8	40+j230	11.8	12	5.8	15
Control Transformers	AY201S-25	From Trans. Autosyn	Dependent Upon Circuit Design				40	10.2	20
Differentials	AY231S-25	From Trans. Autosyn	Dependent Upon Circuit Design				14	10.2	30
Resolvers	AY221S-25	26V, 400~, 1 ph.	70	0.4	108+j440	11.8	50	11.4	24

PYGMY AUTOSYN SYNCHROS



(AY-500 SERIES)

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Transmitters	AY503-4	26V, 400~, 1 ph.	220	2.5	45+j100	11.8	23.0	11.0	24
Receivers	AY503-2	26V, 400~, 1 ph.	220	2.5	45+j100	11.8	23.0	11.0	75
Control Transformers	AY503-3	From Trans. Autosyn	Dependent Upon Circuit Design				170.0	45.0	24
	AY503-5	From Trans. Autosyn	Dependent Upon Circuit Design				550.0	188.0	30
Differentials	AY833-3	From Trans. Autosyn	Dependent Upon Circuit Design				93.0	45.0	30
Resolvers	AY523-3	26V, 400~, 1 ph.	55	0.6	290+j490	11.8	210.0	42.0	30
	AY543-5	26V, 400~, 1 ph.	11	0.12	900+j2200	11.8	560.0	165.0	30

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Telling the Market

Guided missile and aircraft induction generators made by AiResearch Mfg. Co., are described in booklet EB-3-1 being distributed by the firm. Write AiResearch at Los Angeles, Calif. . . . **Mechanical remote controls** for aircraft are described for engineers in Catalog 400 issued by Teleflex, Inc., P. O. Box 69, North Wales, Pa. . . . **Filters** for oil, fuel, hydraulic fluids, gas and air used in aviation applications are covered in 32-page booklet available from Purolator Products, Inc., Rahway, N. J.

Electronic induction heating generators are described and case histories of applications are given in a bulletin being distributed by Induction Heating Corp., 181 Wythe Ave., Brooklyn 11, N. Y. . . . **Quick-quench aluminum heat-treat furnace,** featuring arrested descent of material from furnace to quench, is detailed in brochure available from James H. Knapp Co., 1731 Workman St., Los Angeles 31, Calif.

Ducting systems for jet aircraft are covered in a booklet describing applications in anti-icing, cabin conditioning, auxiliary power needs and other uses. Write Solar Aircraft Co., 2200 Pacific Highway, San Diego 12, Calif. . . . **Tests on wet-strength** of chemically treated Fiber-Glass are described in a booklet being distributed by the Libbey-Owens-Ford Glass Co., Dept. 5, Wayne Building, Toledo 3, Ohio.

Aircraft tooling facilities of Twix Mfg. Co. are covered in a brochure available **from the firm.** Write in care of the Aircraft Tooling Division, 40-09 21st St., Long Island City 1, N. Y. . . . A bibliography on **low temperature characteristics of steels,** 1904-June 1953, with author index, listing chronologically 468 U. S. and foreign articles, translations, pamphlets and books. Write International Nickel Co., Inc., Editor, Manufacturers Literature Section, New York 5, N. Y.

More than 750 **precision, seamless deep-drawn boxes** available from standard tooling are covered in the 1954 catalog available from Zero Mfg. Co., 1121 Chestnut St., Burbank, Calif. . . . Facilities for producing quality **rubber products using synthetic and silicone** rubber compounds are described in illustrated brochure being issued by Goshen Rubber Co., Inc., Goshen, Ind. . . . **Ultrasonic cleaning** is covered in Bulletin GEA-6056 available from General Electric Co. The firm is also making available three other bulletins, GER-819, GEA-6028 and GEC-989 on the recently developed **Fillerarc consumable-electrode gas-shielded welding process.** Write GE at Schenectady 5, N. Y. The firm's Carboloy Dept., Detroit 32, Mich., has issued Bulletin WR-107 dealing with use of **cemented carbides in wear-proofing** pulverizing equipment.

Shock-proof flying helmets designed for crews of highspeed aircraft are described and illustrated in a bulletin being distributed by General Textile Mills, Inc., 450 Seventh Ave., New York 1, N. Y. . . . **Structural latches for aircraft** and other specialized heavy-duty applications are detailed in a series of technical data sheets grouped in a loose-leaf-type folder. Write Simmonds Aerocessories, Inc., Tarrytown, N. Y.

Cutting-off machines and abrasive cut-off wheels, their selection, application and proper useage, also helpful tables for wheel selection and conversion of wheel speeds to feet-per-minute values, are all covered in booklet being issued by Norton Co., Worcester, Mass. . . . **Spindle** that enables operators of boring tools to change tools in less than 10 seconds is described in folder

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Ground power units for aircraft, including uses for 28.5-v. d.c., are described in folder MGC-102 available from Motor Generator Corp., Hobart Brothers Affiliate, Troy, Ohio . . . **Cherry blind rivets** catalog describes complete line, including data on rivet guns needed for application. Write Townsend Co., New Brighton, Pa. . . . **Electric clutch control for power machines** is illustrated and described in Catalog 59 being issued by Micro Division of Minneapolis-Honeywell Regulator Co., Freeport, Ill.

Wirelon ropes, made of high-tensile steel strands and nylon with a steel core of 250-psi. tensile strength, are described in spiral-bound booklet; sample of the product is attached to booklet. Write Rochester Ropes, Inc., Culpeper, Va. . . . **Ultrasonic metroscope** Model MS-101 for measuring wall thicknesses of metals and other materials and for locating internal defects is described in Bulletin 1010 available from J. W. Dice Co., Englewood, N. J.

Magnesium Plate and Sheet to Reduce Weight is title of folder giving dimensions, tolerances and other data on different grades of products fabricated by Brooks & Perkins, Inc., Detroit 16, Mich. . . . **Hydra-Curve flexible jaws** for use with all types of stretch-forming production equipment are covered in folder available from Hufford Machine Works, Inc., 1700 E. Grand Ave., El Segundo, Calif.

Publications Received

- **The Flying Years**—by Lamont Buchanan—pub. by G. P. Putnam's Sons, New York, N. Y.—$5.00. A pictorial history of man's conquest of the air.
- **Airplane Design**—by Gerald Corning—pub. by Edward Brothers, Inc., Ann Arbor, Mich. How to arrive at an airplane design from a definite set of specifications.
- **Tomorrow's Air Age**—by Holmes Alexander—pub. by Rinehart & Company, Inc., 232 Madison Ave., New York 16, N. Y.—$3.00. A popular examination of our predictable future in the Air Age, this report considers the human and technical factors of the airplane's effects on society.
- **Design for Decision**—by Irwin D. J. Bross pub. by The Macmillan Co., 60 Fifth Ave., New York 11, N. Y.—$4.25. The statistical consultant for Cornell University's Medical College here attempts to render modern statistics and the method of statistical decision meaningful for the layman and the research worker.

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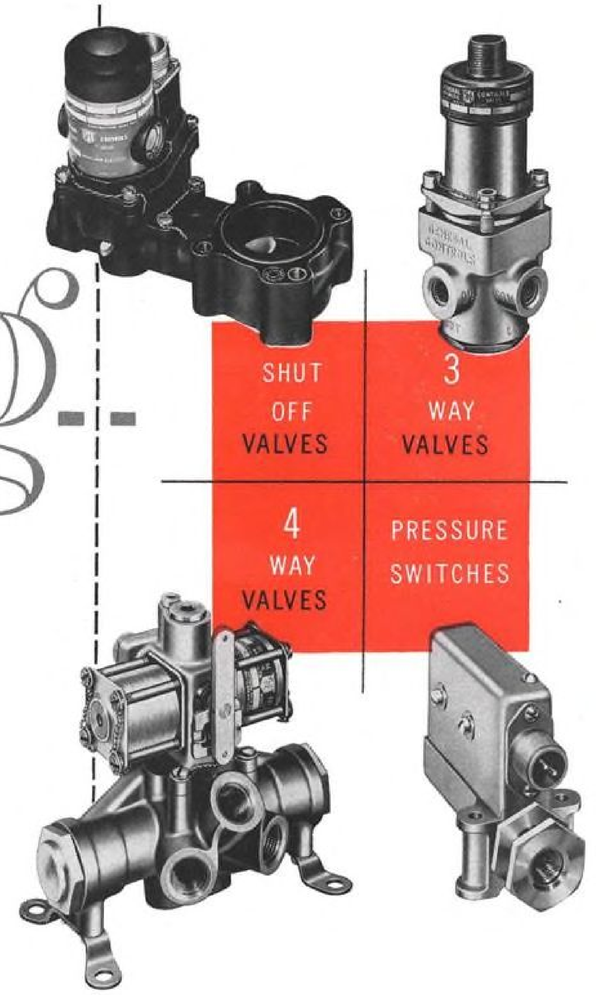

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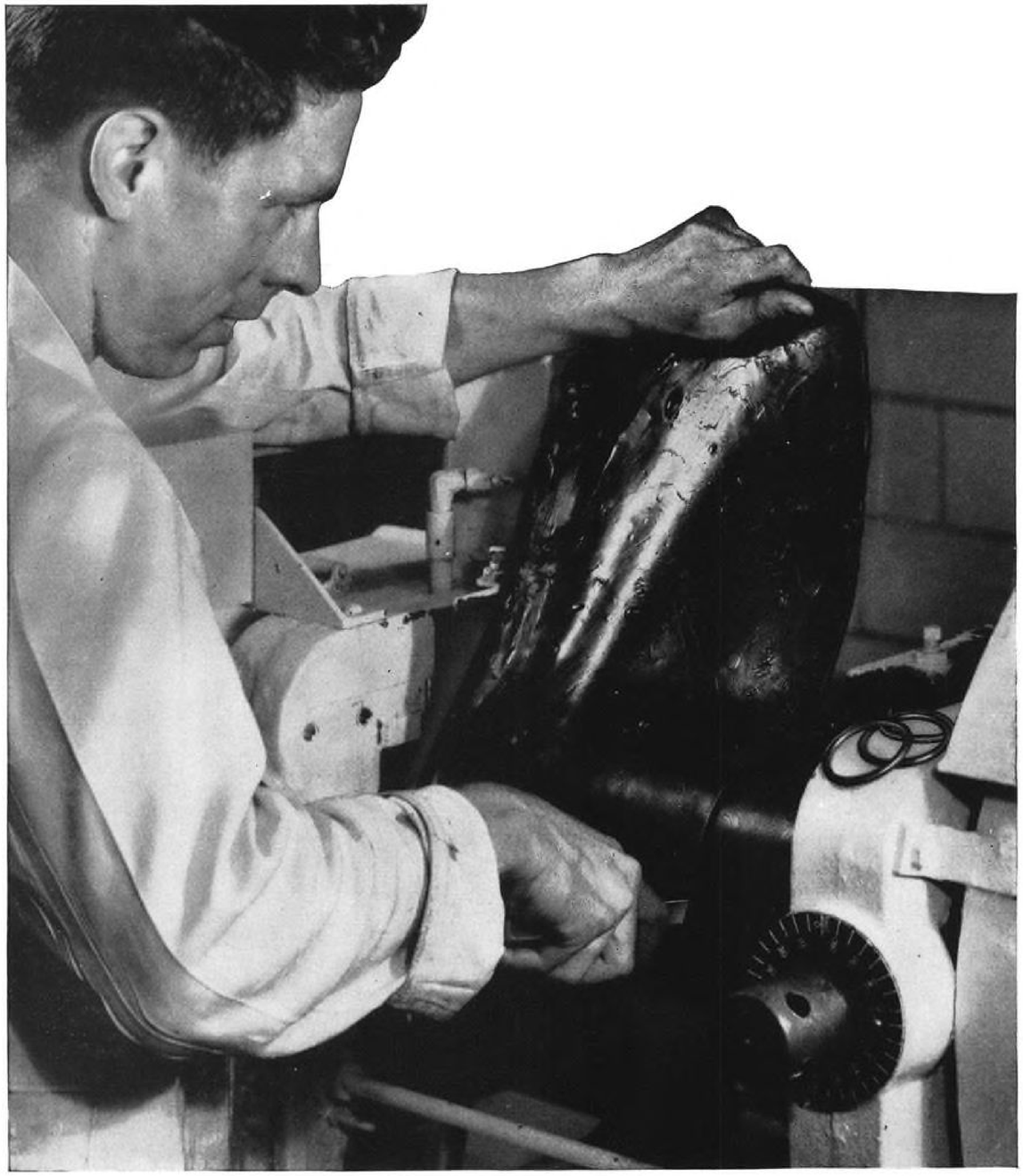

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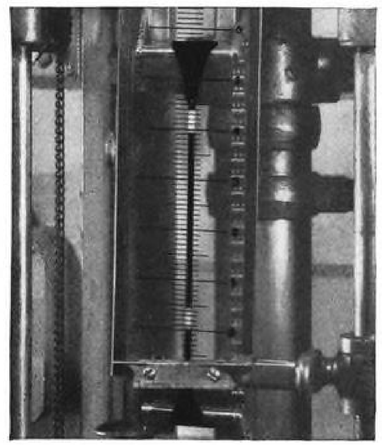

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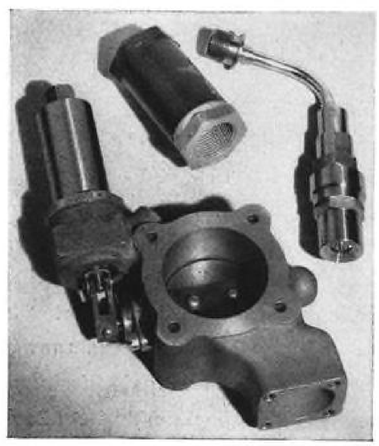

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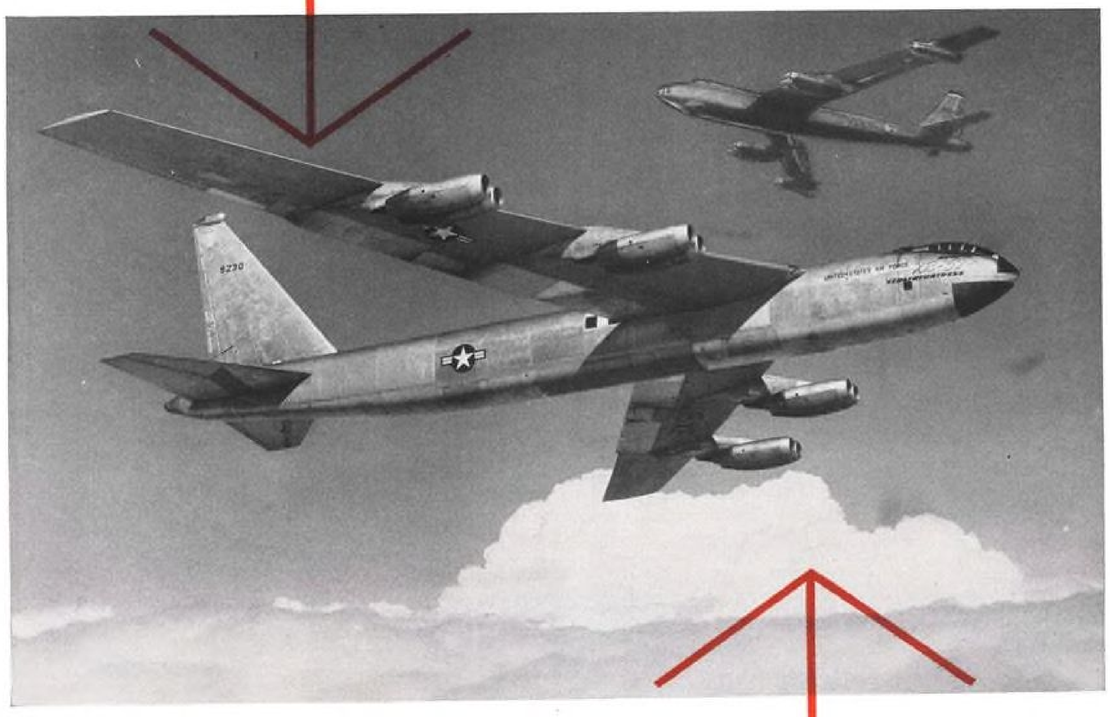

Saginaw Screws actuate the trim tabs on the new B-52 Stratofortress, built at the Seattle plant of Boeing Airplane Company, and both trim tabs and landing gear controls on the new B-47 Stratojet, built at the Boeing plant in Wichita. These highly efficient screw mechanisms transmit the rotary-to-linear force through rolling steel balls with only a fraction of the torque required for ordinary thread-to-thread screws, thus resulting in important weight savings. They can be combined with electrical, hydraulic or pneumatic units. Write today for our Engineering Data Book.

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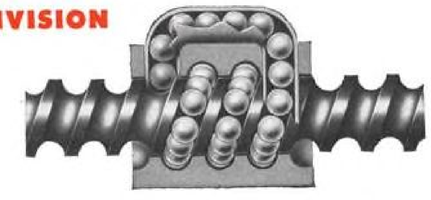


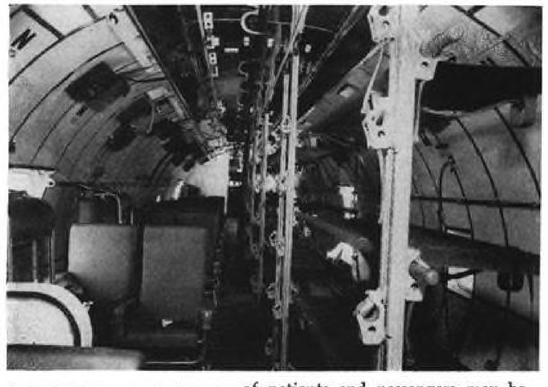
61

MODIFIED BOEING C-97 with redesigned interior for carrying patients, passengers or cargo, leaves Temco Aircraft Corp.'s Greenville, Tex., conversion center where Temco is reworking a number of Stratofreighters for Military Air Transport Service. Interior switch to suit any mission takes less than two hours.

Temco Turns Out 'Triple-Threat' C-97s

BEFORE modification, Boeing Stratofreighter interior looked like this. Note troop seats collapsed against cabin walls. Fittings for litters were rudimentary.

AFTER modification by Temco, neat cabin has 60 comfortable seats, shown folded to permit cargo stowage. Washable Fiberglas sheeting covers Fiberglas insulation.



MIXED LOADS of patients and passengers may be flown using this layout. Litters can be curtained for privacy. Alternately, 60 passengers or 54 litters can be carried in the modified Stratofreighters.

INSPECTION of revised C-97 interior is made by MATS' Lt. Gen. Joseph Smith (foreground). In white shirt is D. L. Hearn, who headed Temco's Stratofreighter conversion team.

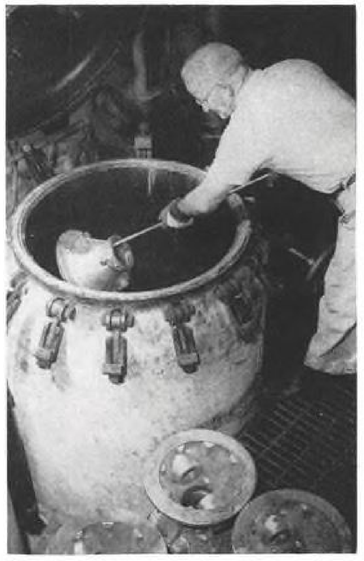
If You Use **HYDRAULICS**
You Need This Folder

Warner's Extension Power Brake Valve, shown above, has an exclusive hydraulic feed-back feature to give the pilot immediate warning in event of hydraulic system failure. This compact, lightweight, space-saving valve is adaptable to a wide range of system and brake pressures.

Warner is qualified by experience and facilities for the design and production of critical hydraulic equipment for a wide range of uses. Warner engineers will welcome an opportunity to assist you in the development of special hydraulic equipment to meet your particular requirements.

Write for your copy of the illustrated folder shown above describing typical examples of Warner precision hydraulic equipment.

Warner DIVISION OF DETROIT HARVESTER CO. OF N.Y. INC.
21533 GROESBECK HIGHWAY • P.O. BOX 3886 • DETROIT 5, MICHIGAN
DESIGNERS AND MANUFACTURERS OF PUMPS • VALVES • ACTUATORS



MAGNESIUM part is lowered into chamber for Permafil impregnation.

Resin Impregnator Cuts Porosity Rejects

Magnesium gearbox castings for A. V. Roe Canada, Ltd.'s Orenda turbojet are being impregnated with Permafil 3255 to minimize rejections stemming from porosity.

The gearboxes are manufactured by York Gears Ltd., Toronto, under subcontract from Avro. The vacuum impregnating equipment is made by F. J. Stokes Machine Co., Philadelphia.

The Permafil, a synthetic thermosetting resin, is a General Electric Co. product, supplied in Canada by Canadian General Electric Co. Ltd.

Castings are delivered to the impregnating operation directly from the foundry after removal of flash. Unless they are oily or greasy, there is no preliminary cleaning. Where required, cleaning is done in a 30-sec. pass through a vapor-type degreaser.

The castings, varying in size, are loaded individually into the Stokes vacuum impregnating chamber. From 15 to 100 pieces may be treated in a single batch. Vacuum is held for one hour to remove all air from the casting pores. Permafil is then drawn into the tank until the castings are covered, and the vacuum is maintained for another half hour. Air introduced into the tank is maintained at 100 psi. for another hour to speed up the impregnation process. Excess Permafil is returned to the reservoir when the air pressure is reduced to 5 psi.

Castings are then cleaned in a luke-warm water and mild detergent solution at 120F. This removes any excess

Can you see the BIG difference?

On the face of it, Avien's Two-Unit Fuel Gage looks like previous systems, but there's a big and important difference behind it all.

Behind this Avien dial face (shown here three times actual size) is Avien's brand-new concept of fuel gage system "packaging."

Previously, you'd find these units behind a dial: an indicator case, motor and balancing potentiometer; and elsewhere a bridge-amplifier, a shockmount and a tank unit.

Now, in the Avien Two-Unit Gage, the necessary components for the bridge and amplifier functions have been built right into the indicator case.

The result: a fuel gage system of "plug-in, plug-out" simplicity, which weighs 50% less and eliminates the need for any field calibration.

What a BIG difference this makes in money!

First of all, the basic system costs less. Less time is spent in installation. Less wiring and connectors are needed. Less maintenance is required, because there are fewer components to maintain. Trouble-shooting time is cut for the same reason. And fewer parts must be stocked for maintenance and repairs.

Because of this new package, Avien gages are now "shelf items." They're completely interchangeable in the aircraft for which they are designed.

Additional functions for fuel management can be easily integrated into the basic Two-Unit system.

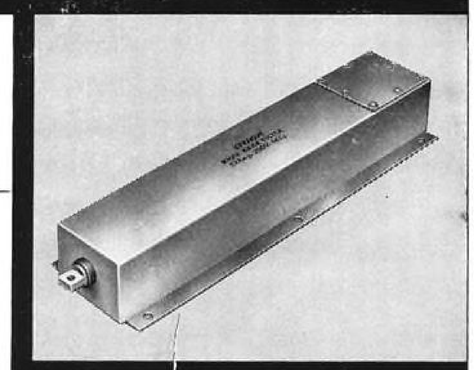
The Avien Two-Unit Fuel Gage is now available to meet your production programs. The indicator is available in either large or small sizes, with all varieties of dial configurations.

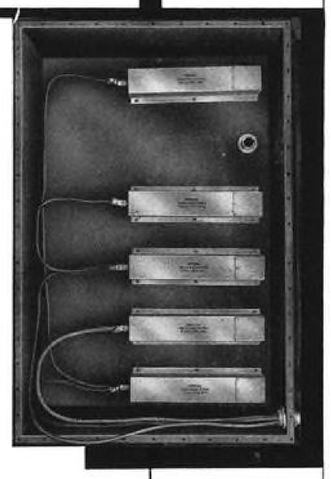
Every month, Avien produces over ten thousand major instrument components for the aviation industry.

The Avien Two-Unit Fuel Gage will make such a BIG difference in your cost sheet, we suggest that you write or call for more information today.

Avien
AVIATION ENGINEERING DIVISION
AVIEN-KNICKERBOCKER, INC.
58-15 NORTHERN BOULEVARD, WOODSIDE, L. I., N. Y.

Screen Room Filters





BETTER BY FAR BY SPRAGUE

The power lines entering your screen room must be r-f free or else the efficiency of your shielded enclosure is greatly reduced.

Sprague engineers, long experienced in the manufacture of radio noise filters for all applications, have developed numerous types specifically for shielded enclosures. A typical installation is shown at right. Note that each filter is provided with a shielded end cap adaptable to most screen room power panels.

Perhaps we can help you improve the performance of your screen room. Write Sprague Electric Co., 327 Marshall Street, North Adams, Massachusetts for further information on modern, high-attenuation filters for screen rooms.

Sprague, on request, will provide you with complete application engineering service for optimum results in the use of radio noise filters.

YOU CAN DEPEND ON

SPRAGUE

Permafil on the surface of the casting. Finally, castings are rinsed at the same temperature and baked in a curing oven at 200F for another hour to thoroughly set the plastic.

GE Expert Praises British Jet Engines

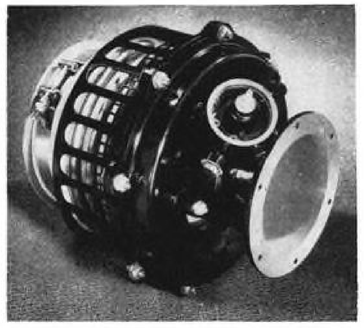
British production turbojets are more powerful, have better fuel consumption, and give more thrust per pound of weight than American engines. But U. S. jets are more compact, with smaller frontal areas.

These views were expressed by David Cochran of General Electric's Aircraft Gas Turbine division at a recent Wings Club luncheon in New York, where he gave his impressions of the Society of British Aircraft Constructors' exhibit at Farnborough and his subsequent visits to five British jet engine manufacturers.

The British apparently take more pains than we to cut away every ounce of metal that is not doing any work.

Cochran estimated that the U. S. makes many more jet engines in a day than the British produce in a week. GE jet aircraft engines alone have by now accumulated more than 1,000,000 hours total operating time.

He compared Rolls-Royce's technique of carefully machining out the 2,000-odd compressor turbine blades which go into a modern jet engine with the mass-production forging techniques used by Thompson Products, who bang out thousands of blades a day. He conceded that the American method required considerably greater production facilities.



VALVE FOR F-102

This pneumatic flow-limiting valve is the first product to be completely designed and manufactured at AiResearch Manufacturing Co.'s new $5-million plant at Phoenix, Ariz. Its function is to maintain constant air pressure. If pressure builds up, valve automatically dumps excess air. Unit is used on Convair's radical, new delta-wing F-102 to keep constant pressures in the plane's cockpit and electronic bay which houses super-sensitive avionic equipment.

Insulation performs a big job in the Mammoth C-124 Globemaster. This sky giant, designed and manufactured by the Douglas Long Beach Plant, depends on HITCO Insulating Blankets for efficient thermal and acoustical insulation.

Thermo-Cousti Cabin Insulating Blankets protect 200 fully equipped troops against noise, heat and cold, in the huge 50,000 pound capacity cargo cabin. Refrasil Preformed High Temperature Insulating Blankets are fabricated of Refrasil Batt, sandwiched between two layers of .002" stainless steel foil. On the C-124 they are installed on the anti-icing Heater Ducts in the tail section and in the wing tips to conserve heat and protect surrounding structure. HITCO insulation is specified because of its lightweight and superior insulating qualities for high temperatures.

HITCO engineering counsel is available to you without charge to help you solve your high temperature or acoustical insulating problems. Write today for illustrated literature.

WRITE OR CALL YOUR NEAREST REPRESENTATIVE:

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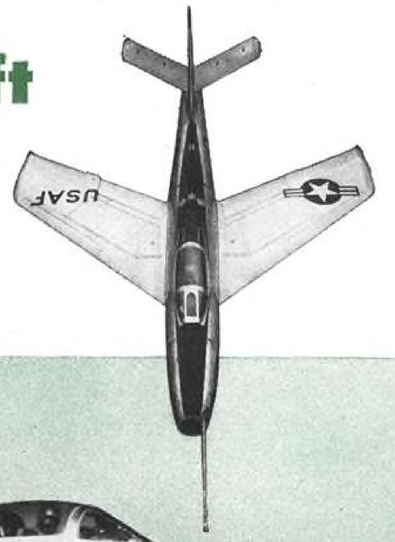
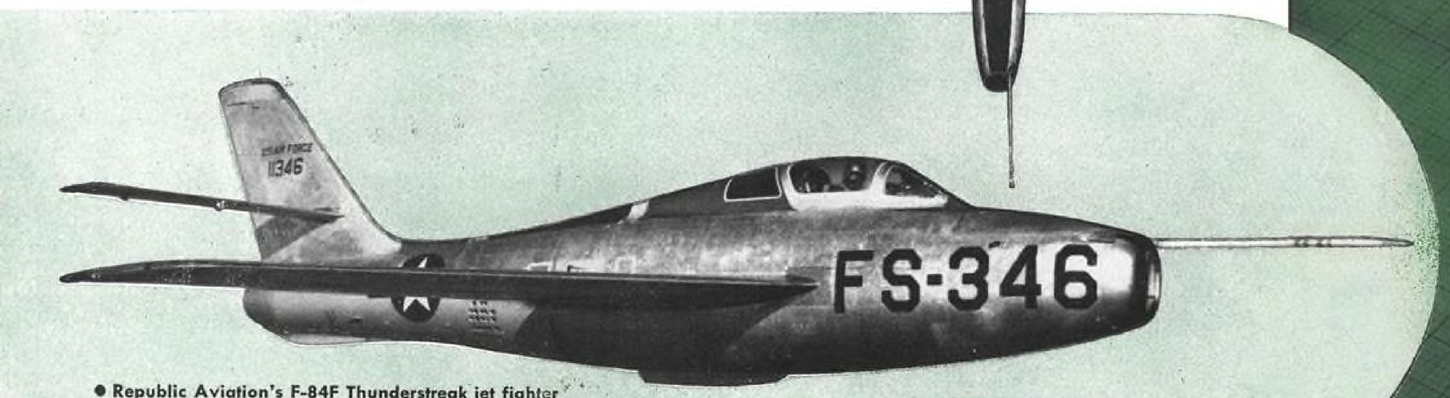
HIGH TEMPERATURE AND ACOUSTICAL INSULATION PRODUCTS

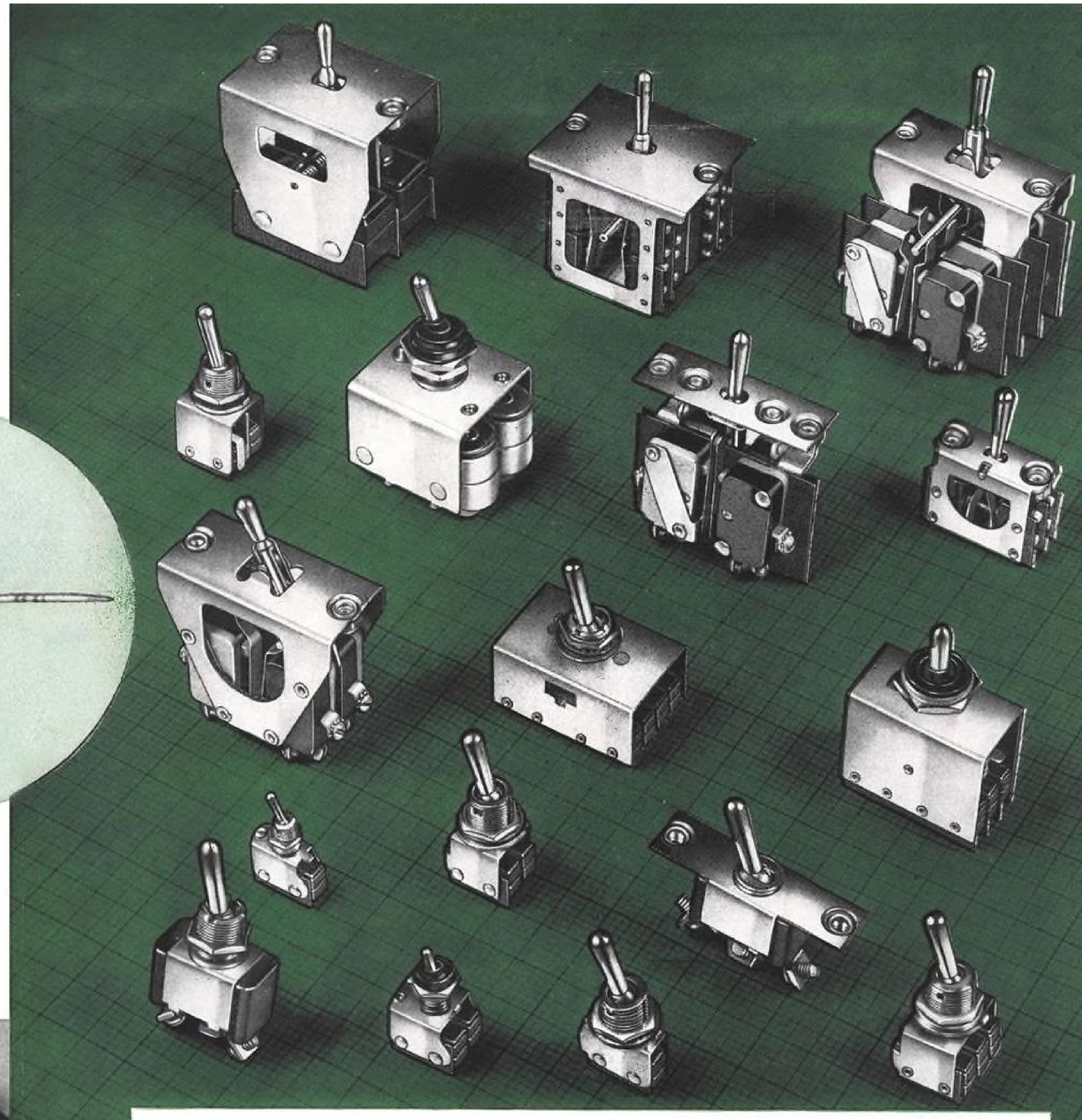
MICRO Toggle Switches

meet exacting aircraft design where inches and ounces count...

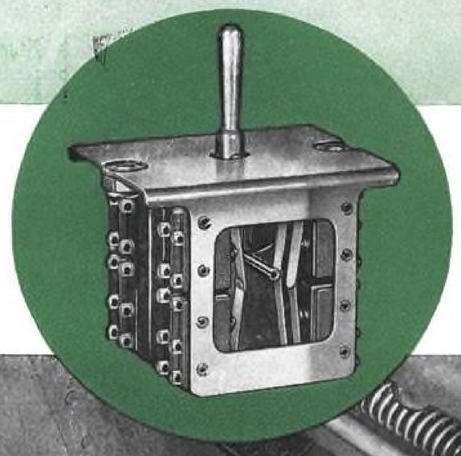




• Republic Aviation's F-84F Thunderstreak jet fighter which depends on MICRO toggle switches for important electrical controls



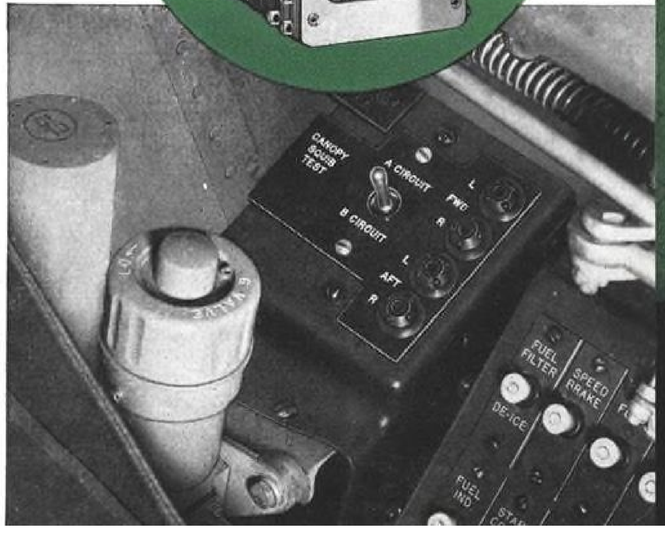
Provide accurate multiple circuit controls in REPUBLIC'S F-84F Thunderstreak



• Control of important electrical circuits in the new REPUBLIC F-84F Thunderstreak jet fighter is the function of MICRO's 3AT16 Toggle Switch . . . an assembly of 16 subminiature switches operated by a single bat handle.

The MICRO subminiature switches used in this assembly are less than ¾" long and weigh less than 1/15 of an ounce. The assembly provides an unusually efficient, compact and lightweight assembly for the control of sixteen circuits. Eight of the switches operate with each direction of the toggle motion.

At the right is shown the MICRO toggle switch assembly before and after installation in the cockpit of the Thunderstreak.



• Here are seventeen different types of MICRO toggle switches developed to meet the most exacting requirements of aircraft design engineers. Whether design calls for a toggle switch (a) hermetically sealed for immunity against altitude or environmental changes, or (b) with sealed toggle lever, or (c) extremely small to fit in close quarters, or (d) assemblies for switching multiple units . . . MICRO has the switch assembly to best fit your needs.

MICRO engineers are specialists in solving difficult aircraft switch design problems. Their assistance is available to you. Contact the nearest MICRO branch office for full information or engineering cooperation.

MICRO
MAKERS OF PRECISION SWITCHES
FREEPORT, ILLINOIS

A DIVISION OF
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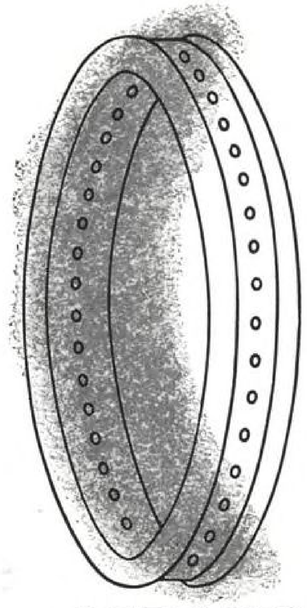
HONEYWELL

In tomorrow's

JET POWER PLANTS

CIRCLE L

LEBANON Castings are at work



Lebanon Steel Foundry, the largest producer of centrifugal castings for jet engines, is proud to have collaborated with the Wright Aeronautical Division, Curtiss-Wright Corporation, in developing this unusual one-piece casting. It incorporates many holes cast to size and in accurate locations, requiring no machining. Of special high-strength alloy steel, this piece is quite large in size and is designed to operate satisfactorily under high temperature conditions in one of Wright's newly-designed power plants.

Lebanon Steel Foundry supplies castings to Wright for the J-65 (Sapphire) turbojet engine, which is now in production, and is producing experimental parts for the company's other advanced jet power plants.

LEBANON Castings

CARBON, SPECIAL ALLOY AND STAINLESS STEEL

CIRCLE L

LEBANON STEEL FOUNDRY **LEBANON, PA.**

PRODUCTION BRIEFING

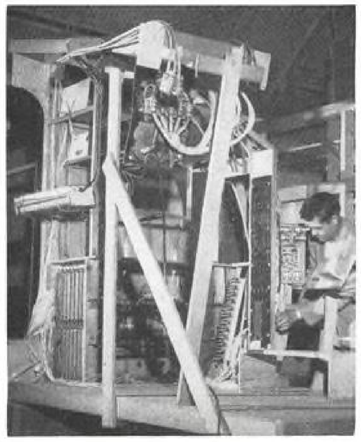
▶ **Hiller Helicopters,** Palo Alto, Calif., has rolled 500th copter off its assembly lines. The firm flew its first rotary-wing aircraft in spring of 1944.

▶ **Norge Aircraft Division,** Muskegon Heights, Mich., has been awarded two contracts for manufacture of major airframe assemblies by Fisher Body Division of General Motors and Republic Aviation Corp.

▶ **American Helicopter Co.'s** wholly owned subsidiary, Plastics Research, Inc., has purchased the assets of Plastics Engineering Corp., Costa Mesa, Calif.

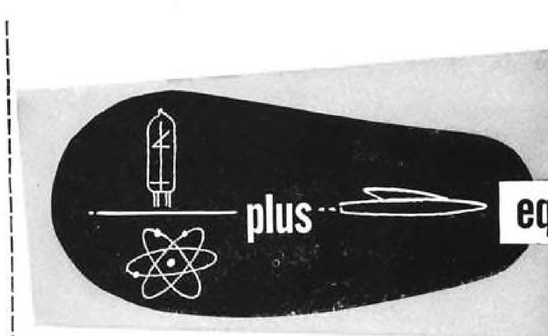
▶ **General Electric Co.'s X-Ray Dept.,** Milwaukee, Wis., has received a nearly 100% increase in its original contract for aerial reconnaissance cameras. Total awards now come to approximately $4 million. More than 55% of the parts are being subcontracted, with more than 60% of the subcontractors classified as "small business."

▶ **Precision Gears & Products,** Paterson, N. J., has received a $1,355,000 contract to manufacture 500 accessory gear assemblies for the Wright J65 Sapphire turbojet. The gear maker is negotiating to build a new 10,000-sq. ft. heat-treating plant adjacent to its 24,000 sq. ft. present factory.



RADIO MOCK-UP FOR CONNIES

Recent conversion of Constellations to tourist configuration at Lockheed Aircraft Service Inc.'s Burbank, Calif., base called for extensive use of this radio installation mock-up, shown being formed and continuity-checked in advance of input schedules. Harness is pre-assembled, facilitating hooking-up process and relieving cockpit congestions.



plus **equal** **a great future for you!**

Leadership in the aviation electronics industry belongs to Westinghouse, whose engineers designed the first completely automatic electronic airborne fire-control system, and the first rate-type interceptor autopilot employing magnetic amplifiers. In its new multi-million-dollar Air Arm Plant, which is wholly company-owned, Westinghouse has assembled top-flight engineers, given them the best and most complete research and test facilities that money can buy, and located the entire operation adjacent to Friendship International Airport, one of the country's newest and largest airports.

The long list of aircraft armament products currently being developed and produced at Westinghouse Air Arm has created a need for outstanding engineers who can meet the challenge of this stimulating new work. The men we want will build for themselves key positions in an organization where the future is unlimited.

Salaries are open, depending only upon training, experience and ability. In addition to a highly respected patent-award plan, opportunities for advanced degrees and a professional working atmosphere, Westinghouse offers all the usual employee benefits, plus!

HYDRAULICS ENGINEER

LOCATION: Special Systems Section of Development Engineering.

DUTIES: Analysis and design of hydraulic valves, pistons actuators and servomechanisms.

REQUIREMENTS: Six or more years experience in hydraulic design. Engineering degree — BS or MS in Engineering.

SYSTEMS ANALYSIS SPECIALISTS

LOCATION: Analytical Section of Development Engineering.

DUTIES: Specialist in operations research. Analysis of aircraft tactical attack problems. Evaluation of detection, acquisition and destruction probabilities of aircraft armanent systems.

REQUIREMENTS: Capable of applying probability theory and statistics. With or without Ph.D. No previous experience necessary if Ph.D.

RADAR DESIGN CONSULTANT

LOCATION: Missile Radar Section of Electronics Engineering Division or Detection Systems Section of Development Engineering Division.

DUTIES: Consultant and advisor on airborne fire-control radar and missle guidance systems.

REQUIREMENTS: Some background in each of the following fields, with a broad knowledge of at least one:
Antenna Design Circuit Design
Servomechanisms
BS degree in Electrical Engineering and 8 to 12 years experience in radar or allied fields also required.

To apply, send resume of education and experience to
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Employment Supervisor, Dept. N-1
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AIR ARM DIVISION

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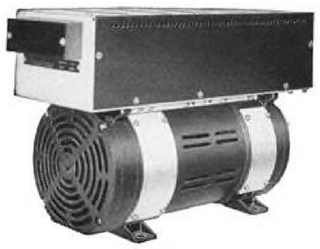
The most complete line of AIRCRAFT INVERTERS



The Red Bank Division of Bendix Aviation Corporation is the logical place to find your answer to aircraft inverter needs—and for three significant reasons. First, we offer the widest range of inverters. Second, we design and build each inverter as a complete, unified mechanism. Third, we are equipped to design and produce inverters for all kinds of special-purpose applications . . . and, in fact, are now engaged in developing inverters up to 5000 VA and for high temperature, high altitude applications. Our current production models are described below. For complete details on these and also on special-purpose designs, write Aircraft Inverter Section, Bendix Red Bank Division, Eatontown, N. J.

INVERTERS—400 CYCLE OUTPUT

Type Number	INPUT		OUTPUT			Approx. Weight Lbs.	Max. Alt. Feet	Designed to Govt. Part No.
	Volts	Amps	Volts	Phase	VA Rating			
12128	27.5	1	26	1	6	5	35000	AN3496-1 AF
MG-54	27.5	22	115/200	1	250	18	65000	E-51A1A-9 Navy
				3	250			
12142	27.5	22	115	1	250	13	35000	N17I58 Navy
				3	250			
12146	27.5	22	115	1	250	13	35000	53B6239 AF
MG-60	27.5	22	115	1	250	17	65000	53B6239 AF
MG-62	27.5	22	115	3	250	17	65000	AN3532-2
32E01	27.5	35	115	1	500	26	50000	AN3533-1
				3	500			
32E00	27.5	45-54	115	1	500	34	50000	AN3534-1
				3	750			
MG-44	27.5	55	115/200	1	750	35	50000	E-52804-2 Navy
				3	750			
MG-57	27.5	100	115/200	1	1250	42	50000	E1737-1 Navy
				3	1500			
MG-61	27.5	100	115	1	1500	51	65000	—
MG-64	27.5	100	115	3	1500	51	65000	—
1518 Mod. 1 & 2	27.5	130	115	1	1500	37.5	20000	—
				3	1800			
1518 Mod. 5	27.5	130	115	1	1500	37.5	35000	—
				3	1800			
32E06	27.5	180	115/200	1	2250	56	50000	E1725-1 Navy
				3	2500			
32E03	27.5	180	115	1	2500	56	50000	AN3516-1
32E09	27.5	180	115	1	2500	56	50000	—
				3	3000			

NOTE: D.C. Input voltage shown is a nominal value of 27.5 volts, but all units are designed to operate from 26 to 29 volts. Input Amperes shown are values at 27.5 volt input.

Manufacturers of Special-Purpose Electron Tubes, Inverters, Dynamotors and Fractional HP D. C. Motors

Bendix DIVISION OF Red Bank

EATONTOWN, N. J.

THE NAME Bendix AVIATION CORPORATION MILLIONS TRUST

West Coast Sales and Service: 117 Providencia Ave., Burbank, Calif.

Export Sales: Bendix International Division, 205 East 42nd St., New York 17, N. Y.

► **Farrand Optical Co., Inc.**, has opened a West Coast engineering office at 5896 West Adams Blvd., Culver City, Calif. R. A. Hamilton has been appointed consulting engineer, optical tooling, and E. L. Fischer has been named technical representative.

► **Heli-Coil Corp.**, Danbury, Conn., is recommending the use of the symbol "STI"—abbreviation of "standard thread insert"—to all manufacturers as the proper designation of taps which provide threads for Heli-Coil inserts.

► **Louis Allis Co.**, Milwaukee 7, Wis., has developed a new line of electric motors rated up to 40 hp. at 3,600 rpm. in open drip-proof, fully enclosed fan-cooled and explosion-proof enclosures. New motors are built to meet new National Electrical Manufacturers Assn. frame size standards and the smaller frame sizes will be available beginning in January 1954, the firm states.

Beech Gives Awards For Aircraft Upkeep

Beech Aircraft Corp. this month inaugurated a program honoring suppliers, subcontractors, manufacturing departments, distributors and owners of planes produced by the Wichita firm.

An award will be made annually to one Bonanza owner in each of Beechcraft's domestic distributor territories on the basis of the condition of his plane as found during maintenance tours conducted by representatives of the company each summer.

Also honored will be hardware, raw material, and parts suppliers for product conformance, performance, craftsmanship, packaging, quantity supplied and compliance with delivery schedules.

Recognition will be given a Beech parts subcontractor and an assembly contractor. The outstanding fabricating, subassembly and assembly departments at each of Beechcraft's plants also will receive awards.

The outstanding Beech distributor will be recognized on the basis of customer and comments and reports from his territory.

Bendix Builds New Engineering Plant

Los Angeles— Bendix Aviation Corp. has broken ground at its Pacific Division plant in North Hollywood for a $250,000 engineering building, the fourth plant expansion in five years.

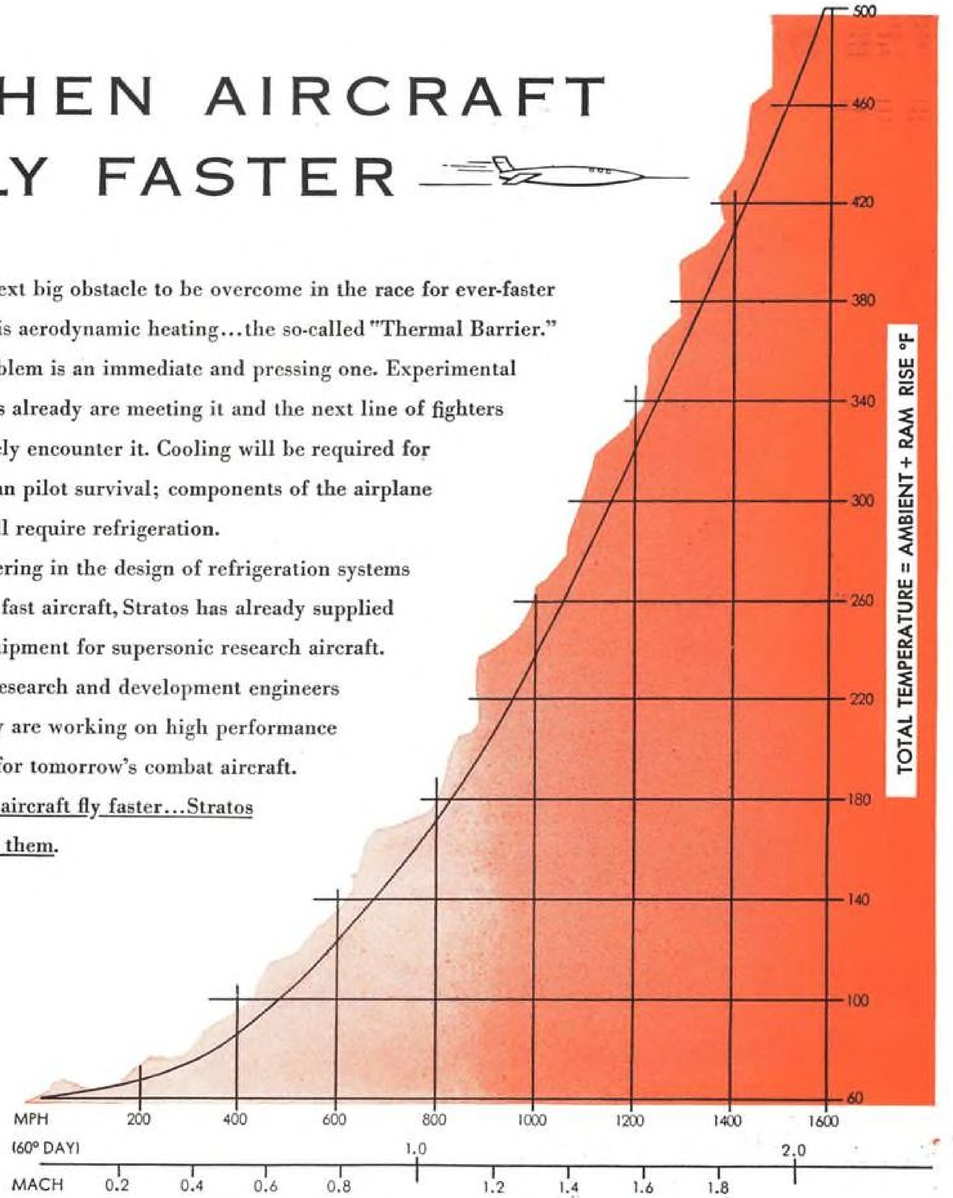
The structure represents the first portion of a large engineering building and will house the airborne radar and hydraulic engineering departments.

WHEN AIRCRAFT FLY FASTER

The next big obstacle to be overcome in the race for ever-faster aircraft is aerodynamic heating...the so-called "Thermal Barrier." The problem is an immediate and pressing one. Experimental airplanes already are meeting it and the next line of fighters will surely encounter it. Cooling will be required for more than pilot survival; components of the airplane itself will require refrigeration.

Pioneering in the design of refrigeration systems for very fast aircraft, Stratos has already supplied such equipment for supersonic research aircraft. Stratos research and development engineers currently are working on high performance systems for tomorrow's combat aircraft.

When aircraft fly faster...Stratos will cool them.



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TYPICAL STRATOS PRODUCTS

REFRIGERATION TURBINE FOR F-86 "SABREJET"

REFRIGERATION PACKAGE FOR B-47 "STRATOJET"

AIR-TURBINE DRIVE FOR OPERATING ACCESSORIES

BOOTSTRAP COOLING UNIT FOR TRANSPORT AIRCRAFT

CABIN SUPERCHARGER FOR TRANSPORT AIRCRAFT

NEWS IN AVIATION

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THIS 28 PAGE BOOKLET gives you all the facts about aviation's new foamed-in-place structural material

Nopco® Lockfoam foamed-in-place plastic has already found wide acceptance for a great variety of applications in the aircraft industry.

As a strong, lightweight reinforcing material it is unexcelled. Radar transmission characteristics are excellent. It can be used for electrical potting and thermal insulation. In its flexible forms it is capable of absorbing heavy impact loads with low shock transmission. Lockfoam can also be cast in molds, fabricated in both rigid and flexible forms. *It is truly aviation's most versatile new engineering tool.*

This fully illustrated booklet, complete with technical graphs and charts, brings you up-to-the-minute, detailed information on Nopco Lockfoam, its properties and potentialities. Send for your copy today and see how Lockfoam can work for you.

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USAF Contracts

Following is a list of recent USAF contracts announced by Air Materiel Command.

Borg Equipment Div., George W. Borg Corp., 120 South Main St., Janesville, Wis., indicator, 2,339 ea., 3,394 ea., $1,336,853.

Consolidated Photo Engravers & Lithographers Equipment Co., 1112 North Homan Ave., Chicago, Ill., C-1B printers, $195,248.

Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J., transmitter, 58 ea., 3 ea., 88 ea., $69,583.

Engineering & Research Corp., P.O. Box 209, Hyattsville, Md., maintenance of flight simulators, $1,047,654.

Raytheon Mfg. Co., 100 Riber St., Waltham, Mass., antenna, 180 ea., 180 ea., mounting, 242 ea., $116,395.

Sparton Automotive Div., Sparks-Withington Co., 50 West North St., Jackson, Mich., release, bomb shackle, 1,380 ea., 276 ea., 1,264 ea., $40,343.

Westinghouse Electric Corp., 32 North Main St., Dayton, Ohio, valve, 1,377 ea., control, 1,330 ea., $1,314,404.

Fast Writeoffs

Accelerated tax amortization for manufacturers expanding their defense facilities is granted by the government in the form of certificates of necessity.

In the following list of recent certificates, company name is given, followed by product or service, cost of construction deemed necessary for defense expansion, and the percentage of the expansion cost allowed for fast writeoff. Fast writeoff permits property to be depreciated in five years.

- **Monument Engineering Co., Inc.,** Indianapolis, Ind., aircraft parts, $2,933, 70%.
- **High Voltage Engineering Corp.,** Cambridge, Mass., scientific instruments for defense, $13,900, 65%.
- **A. T. Wall Co.,** Providence, R. I., components for military end items, $15,427, 70%.
- **Bendix Aviation Corp., Scintilla Magneto Div.,** Sidney, N. Y., aircraft components, $15,135, 65%.
- **Associated Engineers, Inc.,** Agawam, Mass., machining of military end items, $58,860, 70%.
- **Northrop Aircraft, Inc.,** Hawthorne, Calif., aircraft and aircraft parts, $202,822, 60%.
- **Cambridge Corp.,** Cambridge, Mass., scientific instruments for defense, $58,092, 70%.
- **Lord Manufacturing Co.,** Erie, Pa., aircraft parts, $82,309, 65%.
- **Farmingdale Machine & Tool Co., Inc.,** Farmingdale, N. Y., machining of precision aircraft parts, $27,346, 70%.
- **Bell Aircraft Corp.,** Wheatfield, N. Y., aircraft and parts, $21,716, 65%.
- **Bendix Aviation Corp., Pacific Division,** North Hollywood, Calif., research, development and production of electronic equipment,, $538,000, 15%.
- **Swedlow Plastics Corp.,** Los Angeles, Calif., aircraft parts, $12,000, 45%.
- **M. B. Mfg. Co., Inc.,** New Haven, Conn., aircraft parts, $83,745, 70%.
- **Rohr Aircraft Corp.,** Chula Vista, Calif., aircraft components, $744,199, 55%.
- **Kearfott Co., Inc.,** West Paterson, N. J., precision instruments for defense, $24,069, 70%.
- **Micro-Precision, Inc.,** (formerly Diesel Engr. & Mfg. Co.), Evanston, Ill., aircraft parts, $220,000, 45%.
- **Propulsion Research Corp.,** Gardenia, Calif., research and development for the armed services, $2,949, 70%.
- **Stewart-Warner Corp.,** Stewart-Warner Electric Div., Northbrook, Ill., research, development and production of military

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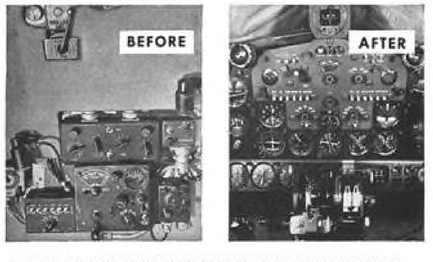

ORDINARY INSTALLATION VERSUS RAS INSTALLATION... On the left is an ordinary installation of a $29,000 "nerve and control center." On right, same equipment "custom engineered" by RAS specialists. RAS complete facilities include main hangar handling twenty-five planes "in work" at one time, complete radio and electronics service center, most modern equipment for engine and accessories overhaul.

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says, regarding its Skymaster modification program, "I am happy that we are able to work out the new job order in Grand Central's favor because you did such a grand job with the last order. Frankly, I insisted that our people turn to you in spite of the fact that considerably lower bids had been received. There are no substitutes for quality, loyalty, sincerity and experience. My one regret is that so few people recognize this fact today."

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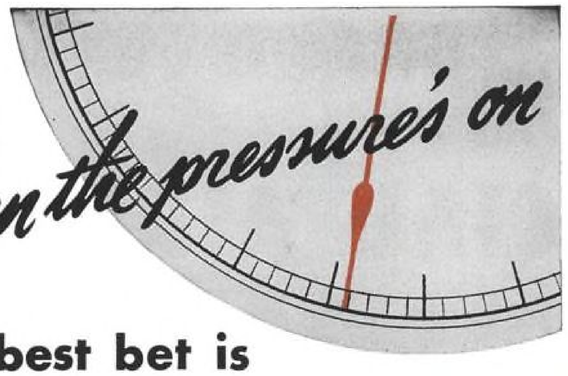

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communication equipment, $2,500,000, 65%.

• **Northwest Airlines, Inc.,** St. Paul, Minn., air transportation, $16,116,300, 80%.

• **United States Testing Co.,** Hoboken, N. J., development and research, for the armed services, $2,676, 65%.

• **Hughes Tool Co.,** Hughes Aircraft Co. Div., Culver City, Calif., electronic equipment, $417,046, 65%.

Navy Contracts

Contracts recently announced by the Navy's Aviation Supply Office, 7000 Robbins Ave., Philadelphia 11, are:

Aerol Co., Inc., 2424 San Fernando Rd., Los Angeles 65, wheel assembly, 1,421 ea., $35,880.

Airborne Accessories Corp., 1414 Chestnut Ave., Hillside 5, N. J., actuators, $562,023.

American Bosch Corp., 3664 Main St., Springfield 7, Mass., maintenance parts for various aircraft, $50,762.

Bendix Products Div., Bendix Aviation Corp., 401 Bendix Drive, South Bend 20, Ind., maintenance parts for various aircraft, 1,540 ea., $909,376; strut assemblies, $1,719,153; maintenance parts for strut assemblies, 2,310 ea., $2,075,319.

Dayton Rubber Co., 2342 West Riverview Ave., Dayton 1, Ohio, tube, oxygen, 8,872 ea., $49,157.

Douglas Aircraft Co., El Segundo Plant, El Segundo, Calif., maintenance parts, $45,366; aviation armament spares for various aircraft, $131,124.

General Electric Co., 1405 Locust St., Philadelphia 2, Pa., indicators, 104 ea., $26,826.

Goodyear Tire & Rubber Co., Inc., 1144 E. Market St., Akron 16, Ohio, lining, 52,560 ea., $109,796; maintenance parts for various aircraft, $41,801.

Gould-National Batteries, Inc., 35 Neoga St., Depew, N. Y., batteries, $40,945.

C. G. Hokanson Co., Inc., 2140 Pontius Ave., Los Angeles 25, Calif., preservation units, $104,312.

Hydro-Aire Inc., 3000 Winona Ave., Burbank, Calif., valves, $38,890.

Lenoir Wood Finishing Co., 284 E. Harper Ave., Lenoir, N. C., resin, 21,000 gal., $39,630.

Glenn L. Martin Co., Baltimore 3, Md., parts for test bench harness, $26,563.

Mar Vista Engineering Co., 5428 West 104th St., Los Angeles 45, Calif., hydraulic valves, $67,615.

Minneapolis-Honeywell Regulator Co., 2600 Ridgway Rd., Minneapolis 13, Minn., power and tank units, $79,927.

Pacific Division, Bendix Aviation Corp., 11600 Sherman Way, North Hollywood, Calif., actuators used on R6O-1, -IZ, AU-1 aircraft, 254 ea., $27,203.

Switlik Parachute Co., Inc., 1325 East State St., Trenton, N. J., vest, life preserver, 14,000 ea., $247,100.

Weber Aircraft Corp., 2820 Ontario St., Burbank, Calif., seats for various aircraft, $325,185.

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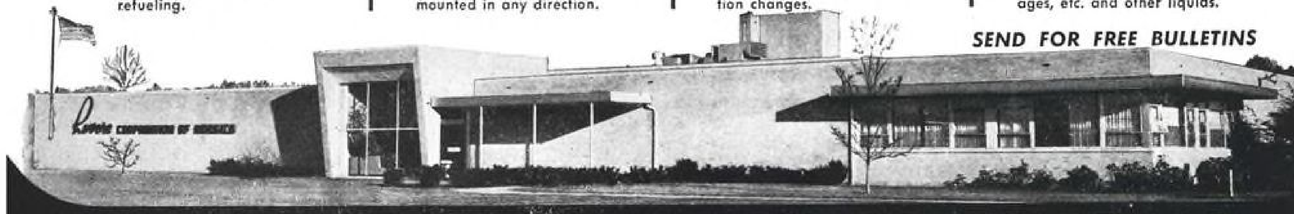

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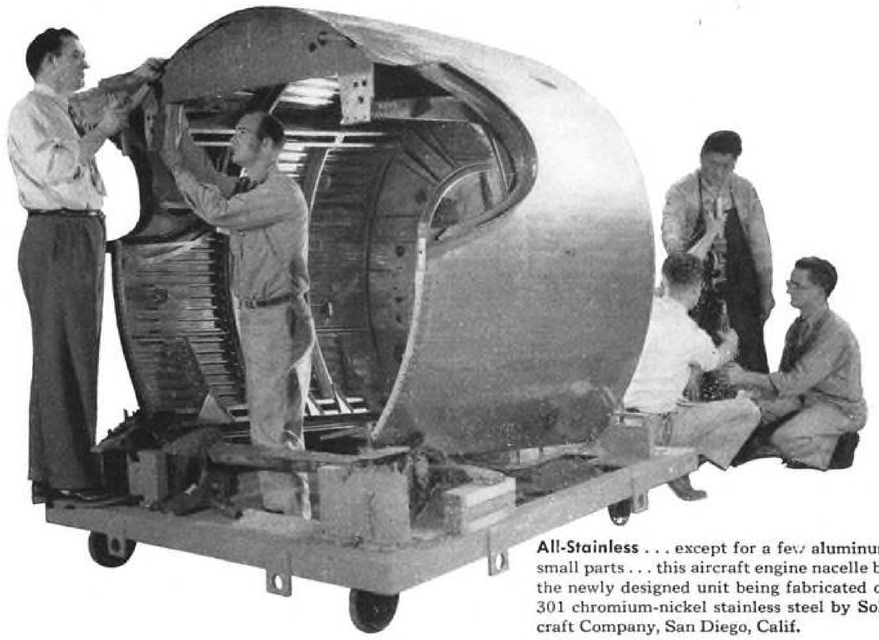

All-Stainless . . . except for a few aluminum alloy small parts . . . this aircraft engine nacelle barrel is the newly designed unit being fabricated of Type 301 chromium-nickel stainless steel by Solar Aircraft Company, San Diego, Calif.

How Airframe Manufacturers Improve Structural Strength of Nacelles . . . with Type 301 Stainless

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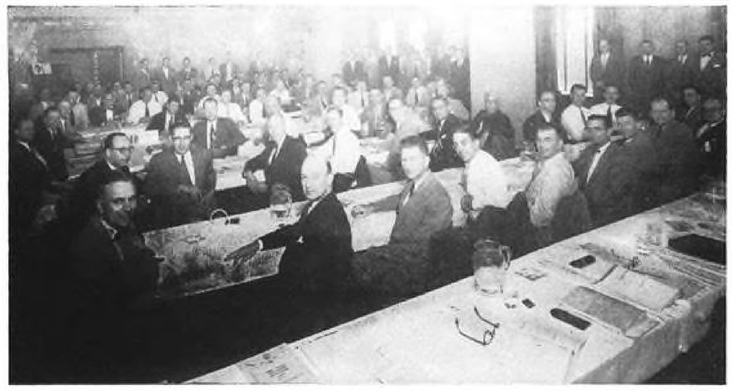

AIRLINES ELECTRONIC Engineering Committee of Arinc at Kansas City meeting.

AEEC Acts on Avionic Problems

Engineers adopt tentative specs for Selcall system of ground-to-pilot signaling; radar tests studied.

By Philip Klass

Kansas City, Mo.—Selcall, a new system which enables an airline ground station to ring a buzzer in the cockpit of an airplane to which it wants to talk, received a tentative endorsement from the Airlines Electronic Engineering Committee (AEEC) of Aeronautical Radio, Inc., which met here recently to discuss mutual avionic problems.

The new selective calling system is intended to relieve airline pilots of the fatiguing task of continuously monitoring company communications channels, particularly during long flights.

▶**Large Attendance**—Engineers from more than 20 airlines, including British Overseas Airways Corp., Air France, Scandinavian Airlines System, Trans-Canada and Canadian Pacific airlines, attended the three-day AEEC meeting and the two-day maintenance session which followed.

Total attendance figure of 120 included more than 50 representatives from industry as well as the Navy's Fleet Logistic Air Wing, USAF Headquarters, Civil Aeronautics Administration, Federal Communications Commission and the British Embassy.

▶**On the Agenda**—Other items, in addition to Selcall, on the AEEC agenda on which the group heard reports and/or took action included the following:

- United Air Lines radar tests.
- New VOR test facility.
- New avionic cooling approach.
- Quick-disconnect radio rack shelves.
- Results of airline DME tests.
- VHF 360-channel communications specification.
- Change in ILS frequency pairing.

Selcall

Pan American Airways first brought up the subject of Selcall to the AEEC about nine months ago. PAA felt that other airlines might share its own pressing need for a selective calling system, thereby justifying an industrywide approach.

Meanwhile PAA's Pacific-Alaska division decided to construct an airborne adaption of a calling system developed by Motorola (for industrial use) and flight test it.

▶**How It Operates**—The Motorola system operates on the basis of a ground station transmitting two consecutive tone pulses, each of approximately ¾-second duration. Each of the pulses contains two simultaneously transmitted tones (frequencies). The airborne Selcall unit, which connects to the regular HF or VHF receiver, contains four vibrating reed elements, each tuned to respond to a single, but different, tone.

SELCALL enables airline ground stations to flash a light in the cockpit of an airplane to which they want to talk. It requires addition of a small airborne unit, like the PAA prototype shown.

When a ground station broadcasts the brief two double-tone pulses (in proper sequence) corresponding to an airplane's assigned code, it triggers the airborne Selcall unit's four reeds to flash a light or ring a buzzer in the cockpit.

A dual-channel airborne Selcall unit, mounted in a short half-ATR case, should weigh about 10 lb. and sell for approximately $500-$600, a Motorola spokesman told the AEEC. Motorola showed a prototype unit.

▶**Hundreds of Codes**—The present Arinc spec calls for using 12 tones in the frequency range of 300 to 1,000 cps. This gives 2,970 different possible codes, but only 1,438 of these are recommended for use initially because of the possibility of false triggering due to harmonics and cross modulation effects.

If all 2,970 codes were used, there would be the chance of rousing two or three aircraft when only one was being called. Widely dispersed airline operations make this a somewhat remote possibility, and the consequences are not serious: the unwanted pilots merely "hang up." However, the AEEC decided to use only the 1,438 codes until more are required.

▶**More Codes Possible**—By using closer frequency spacing between tones, future expansion of the system to 8,910 useable codes is possible, Motorola says. This would involve adding two new groups of 12 tones in the 300-1,000 cps. band.

Since not all aircraft will be equipped with Selcall, and since the number of domestic airliners and international aircraft now operating in the U.S. totals only 1,450, the consensus of AEEC members was that the system has adequate capability to handle future airline growth.

After six months of flight tests on its own prototype unit, from San Francisco to Singapore, PanAm is extremely enthusiastic over the new selective calling system. Kenneth Moore, PAA engineer, reported "essentially 100% performance through interference" at distances up to 2,500 miles, and no false triggering.

On the one or two occasions where the ground operator failed to rouse the plane on the first call, he immediately tried again and was successful, it was reported.

▶**Some Reluctance**—Despite PAA's enthusiasm, some AEEC members were reluctant to say: "This is it." Representatives of several airlines felt that interested operators should try out a few equipments to learn more about Sel-

Flight into fact

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call's operational capabilities before AEEC finalized the spec.

AEEC members recognized that the airlines (except for PAA) had not given sufficient thought as to how they would use Selcall in their operations.

After much consideration, the group agreed to issue the Selcall characteristic as a "tentative" spec as soon as the Arinc board and member companies approve the draft. This would allow interested airlines and equipment manufacturers to proceed. Later, when more operational experience has been gained, the spec could be revised if necessary and the tentative qualification will then be removed.

As approved, the characteristic provides for either a single- or a dual-channel airborne unit in which codes are changed by plugging in new reeds, or by means of a code-changing selector switch. The latter will require 12 separate reeds, increasing its cost. The dual channel unit permits connection to separate receivers and would be of most interest to overwater operators desiring to monitor two HF frequencies simultaneously.

UAL Radar Tests

To evaluate the suitability of 6-cm. radar for storm warning use, United Air Lines made 35 flights and racked up 131 hours this past summer in a DC-3 equipped with an experimental radar built by Radio Corp. of America, Frank Todd of UAL told the AEEC. Todd is chairman of the AEEC radar subcommittee. United is currently analyzing the vast amount of test data, including 4,500 radar scope photos. As a result, Todd declined to express any official conclusions at this time.

AEEC members who had flown on UAL radar test flights made the following observations:

- **Radar infallibly showed** a path through all storms encountered.
- **Surprisingly good resolution** was obtained at reduced sensitivity control settings. (One objection originally raised to the choice of 6-cm. radar was that it would not have as good resolution as 3-cm.)
- **Hailstorm detection** capabilities of radar appear "encouraging."
- **Radar stability** was good, with no retuning of the magnetron or klystron required during the three months of testing.
- **Present CRT display tubes** are all right for night operations but they lack sufficient brilliance for satisfactory use in a cockpit illuminated by sunlight. It was generally agreed that a storage-type tube is required.

Although several manufacturers (RCA, Farnsworth, Hughes, Raytheon) have storage tubes under development, there are none in production which

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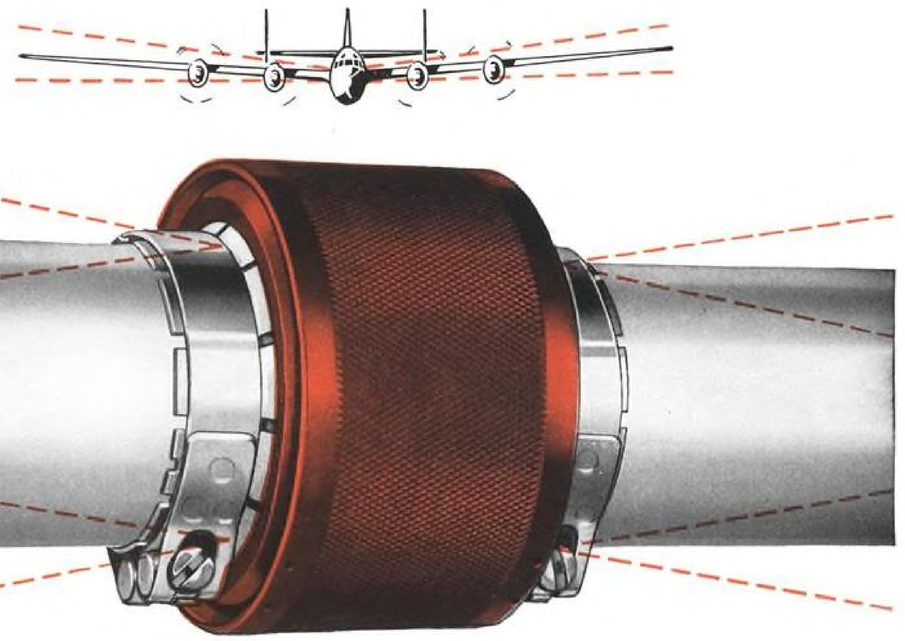

Another "first" for Aeroquip! The amazing Flex Joint permits flexing of rigid fuel lines in aircraft while maintaining a positive, fluid-tight seal. Of simple, bellows-type design, the Flex Joint allows tubing to "give" 10°, plus or minus, and accommodates wing deflections, vibration, thermo-expansion, and construction tolerances. It is compact, light in weight and can be installed in confined areas without special tools . . . without precise cutting of tubing or flaring of tube ends. Extensive tests on the Flex Joint have been conducted ranging from —65° F. to +160° F., from flexing, vibrating and actuating, to testing under pressure and vacuum, and determining ultimate strength by bursting. The work has been conducted along lines laid down by the N.A.S.C. Descriptive literature is available; please write.

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Today, helicopter builders are using Cleveland Pneumatic's friction-less combination of a screw and some balls to adjust the angle of the whirling blades on the 'copter. This device is called a "ball-screw actuator".

Ball-screw actuators are useful in many applications in either of two ways... to multiply the power of a drive... or to increase its speed. You also get the hair's-breadth accuracy of a metal-to-metal drive that eliminates merely-approximate positioning of other systems.

Somewhere in your product or your idea for a product, you may be able to use Cleveland Pneumatic ball-screw actuators. They've been engineered by us in all sizes... from tiny ones for 'copter blades to the giants that we make to raise and lower bomber landing gears.

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meet the airline radar needs. Frank White of ATA reported that there was a possibility that the Air Navigation Development Board might sponsor the design of a suitable storage tube.

VOR Test Station

The Civil Aeronautics Administration and Eastern Air Lines have worked out an arrangement which clears the way for EAL, and other airlines, to provide and operate much-needed transmitters for ramp testing of omnirange receivers, Howard Mehrling of EAL reported. CAA has lacked the funds to set up and operate the VOR test stations and the airlines lacked the legal authorization to operate them.

▶ **EAL to Operate for CAA**—Under the new arrangement, CAA will assume the licensee responsibility for the EAL-owned test facility at Miami International Airport. In return, EAL will operate the station and maintain certain transmission accuracies and operating schedules. Important aspect of the deal is that the CAA assumes all legal liability for the station's operation.

The EAL station, which has been operating for two years, in accordance with special arrangements with CAA and FCC, will now be listed as an official CAA station. It will operate at 112 mc., 24 hours a day, and be monitored daily except Saturday and Sunday, an Eastern spokesman says.

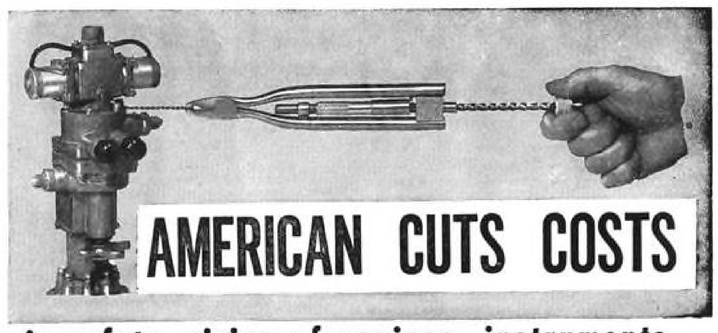
ATA's Frank White expressed the hope that other airlines would work out similar arrangements with CAA for all major airports, and a PanAm spokesman said his airline would probably take such action.

New Rack Designs

Airliner radio racks and their avionic equipments of the future may be designed to use a new type of cooling system in which each equipment case is vented to a common ducting system which pulls cooling air through the units. Douglas Aircraft Co. has been experimenting with such a system for more than a year, and other major airliner manufacturers are reportedly interested, according to A. W. Rebard, Douglas engineer.

The present convection cooling arrangement is not able to handle growing numbers of avionic equipments which have doubled the amount of heat generated in the radio rack. As equipment temperatures climb, equipment failures usually follow.

▶ **Trend to Ducted Cooling**—Rebard told the AEEC he understood that Bonanza Airlines is going to equip its DC-3s with ducted cooling and he urged that all future avionic equipment should be designed for it. A United Air Lines engineer, K. M. Cummings,



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said that UAL expects to equip its DC-6Bs and Convairs with some type of ducted cooling within the next year.

Rebard proposed the use of an air intake vent in the lower front panel of the case, an exhaust vent in the top rear panel, and elimination of existing ventilation louvers. AEEC members expressed concern over this approach because the equipment would roast if the common cooling system failed.

▶ **Quick-Disconnect Shelves**—Douglas has developed a new type of junction box which makes it possible to remove and replace a radio rack shelf (and associated wiring) in a couple of minutes instead of the eight hours now needed, Rebard told the AEEC. The new design replaces conventional terminal strips with several small 15-pin connectors.

All male connectors are mounted on one plate, which is wired to the shelf. All female connectors are mounted on another plate attached to the radio rack frame. The two plates and their connectors, as well as the shelf itself have quick-disconnect-type fasteners.

Despite its advantages, the new shelf design is actually several pounds lighter than present designs, Rebard said.

DME Tests

AEEC by-passed discussion of its proposed specification on distance measuring equipment pending announcement of the results of current negotiations between the Defense Dept. and the CAA to come up with a DME which is compatible with both military and civil needs (AVIATION WEEK Oct. 12, p. 7). The committee did hear reports from airlines which have been testing several of the present civil airborne DME units.

Mohawk Airlines, which made a fleetwide installation under contract with the Air Navigation Development Board, is currently working out DME holding procedures with the CAA, Mohawk's R. R. Taylor told the AEEC. These procedures will be used only during VFR weather until the procedures and DME reliability are firmly established.

▶ **Maintenance Troubles**—Taylor reported considerable trouble initially with the Hazeltine type DIB units, aggravated by a lack of suitable test equipment. Although some units operated up to 800 hours without failure, average equipment removal for maintenance came after 50 hours, he said. Mohawk is currently analyzing some 2,300 position checks on DME accuracy made from known landmarks during VFR conditions.

A PanAm spokesman reported that its Federal type DIA unit had racked up 1,200 flight hours and 350 hours of operation to date, with 14 equipment failures during this time, most of them during the first six months. Pan-Am also reported several failures in the Narco type DIC and Bendix type DID which it recently started testing.

TWA reported only three removals of its Federal DME in 1,800 flight hours, while United listed only one failure, but noted that the unit was not used much because few of the routes over which the plane operated were equipped with commissioned DME ground stations.

William Carnes of Arinc pointed out that the Federal DMEs under test by PAA, TWA, UAL, and Capital were very early models and that the CAA set up the DME tests to gain operational experience rather than to evaluate the specific airborne equipment.

▶ **Very Useful**—"DME is very good for orbiting and extremely useful in ILS approaches," B. R. Rashkow of PAA reported. R. N. White of TWA said that DME was very useful for aircraft identification during a radar approach, enabling the pilot to give his distance from the airport or DME station. However, ATA's Frank White warned that the radar controller must still ask for the airplane to make an identifying turn. Other airline engineers said it was difficult to get pilots to fill out reports on their DME test observations.

New VHF Spec

AEEC officially approved Characteristic 520-A, (a major revision of the previously issued Characteristic 520) which describes an airborne 360-channel VHF communications system (transmitter and receiver) with 50-kc. spacing. The new characteristic now goes up for approval by the Arinc board and member airlines before being released.

When the airlines are equipped with the new system, the number of communications channels available in the 118-136-mc. airline band will be at least doubled. The majority of present airline equipment provides a minimum of 50 channels (200-kc. spacing).

The new 520-A spec provides for three different modes of operation:

- **Single-channel simplex** (transmitter and receiver on same frequency).
- **Double-channel simplex** (transmitter 6.0 mc. higher frequency than receiver).
- **Double-channel duplex** (permitting simultaneous transmission and reception with 6.0-mc. separation in frequencies).

▶ **Tough Assignment**—AEEC took on a tough job when it decided to write 520-A to include sufficient flexibility to enable the equipment to function with a future Air Traffic Control Signalling System. The reason is that ATCSS system characteristics are still fluid (ATCSS is a method of easing the burden on voice channels by transmit-

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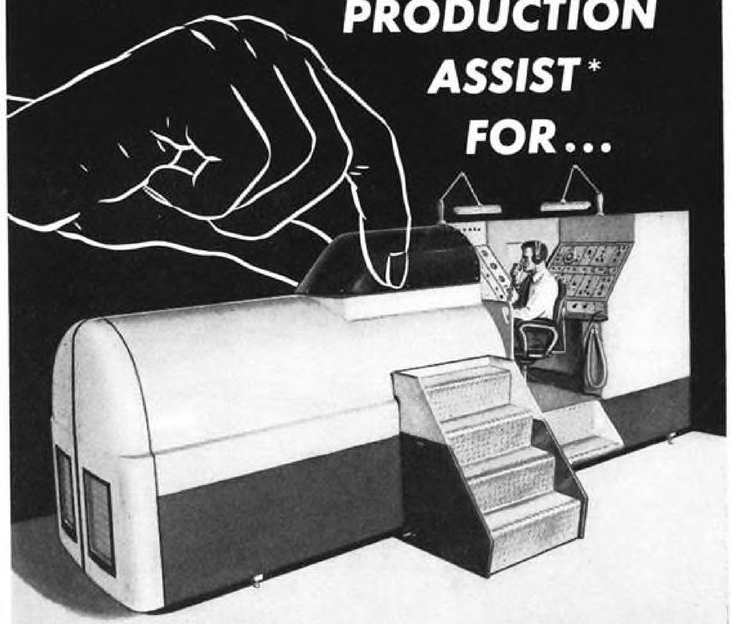

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ting many standard instructions from ground controllers in coded pulse form for visual display on a suitable cockpit instrument. The pilot will then acknowledge receipt of these instructions back to the ground controller using a similar coded transmission.)

In return for its troubles, AEEC hopes that the 520-A equipment can be used for either voice communication or for ATCSS, thereby saving the airlines from buying special ATCSS transmitters and receivers.

► **Special Requirements**—Some of the special requirements incorporated in 520-A to meet ATCSS needs include:

• **Rapid keying of transmitter** to permit an RF envelope rise time of less than 1.5 milliseconds.

• **Greater bandwidth in modulator.**

• **Lower spurious radiation from transmitter.**

• **Reduced spurious response in receiver.**

The 520-A spec also provides for a receiver bandwidth and stability sufficient to permit its use in VHF network operations where several stations broadcast the same message on carriers whose frequencies are spaced 7.5 kc. apart.

The British are operating such networks under the name of "Climax" (AVIATION WEEK June 23, 1952, p. 54).

In the U. S., similar networks are in the process of development for specialized applications. One such network is operating on an evaluation basis between Chicago and Cleveland, along United Air Lines routes, with five interconnected stations located at Chicago, South Bend and Auburn (Ind.), and at Toledo and Cleveland.

New ILS Plan

The growing number of civil and military ILS installations, particularly in high-density areas, both in this country and in Europe, is making it necessary to put into use more of the frequencies originally set aside for ILS. This will create problems for those airlines which are still using the older (war surplus) ILS receivers which have provision for only six channels instead of the 20 channels available in newer ILS equipment.

As a solution to this problem, the Air Force has proposed a plan which calls for:

• **Discrete pairing** of glide slope and localizer frequencies so that each glide slope frequency is assigned to one and only one localizer frequency.

• **Frequency reassignment** of some U. S. civil ILS so that all domestic stations will operate on one of six channels.

• **Four additional ILS** channels to be implemented for military and foreign use.

The AEEC heard the results of a CAA study which showed that only six existing civil ILS facilities would require a frequency shift under the proposed plan. These are Worcester, Mass., Harrisburg, Pa., Teterboro and Atlantic City, N. J., Philadelphia, and New Castle, Del.

The AEEC endorsed the general features of the USAF plan, with the provision that any change in the existing domestic ILS frequencies prior to Jan. 1, 1955, is first coordinated with the airlines affected by the change. After January 1955, AEEC felt that all international airlines requiring more than six basic channels would be equipped to handle the additional channels where necessary.

The proposed plan has already been coordinated with the International Air Transport Assn. members and will come up for approval at the Fifth Communications Division meeting of the International Civil Aviation Organization next Spring.

How AEEC Works

The Airlines Electronic Engineering Committee is a 16-man group made up of representatives from 12 U. S. and Canadian airlines, plus one member from each of the following: Air Transport Assn., International Air Transport

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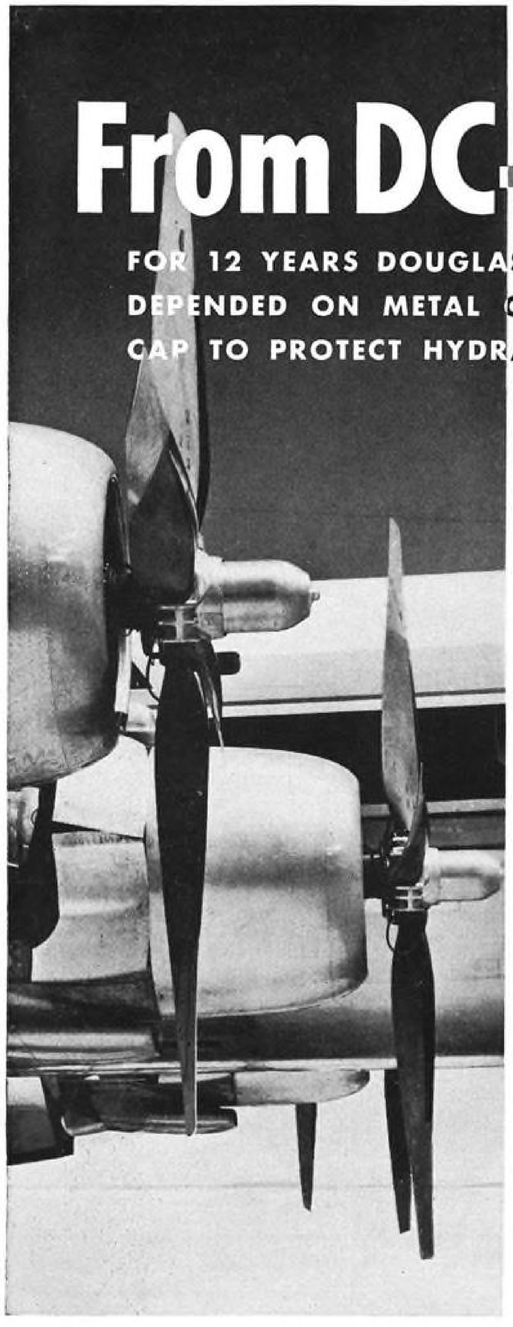

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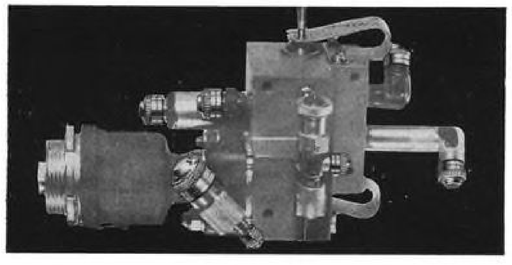

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Assn., Military Air Transport Service, and Aeronautical Radio, Inc. Wm. T. Carnes, Jr. is the Arinc representative and chairman of AEEC.

►**Preparing Specifications**—Detailed preparation of Arinc equipment characteristics (specifications) or the study of a knotty problem is carried out by AEEC subcommittees made up of interested airline representatives working with industry and government engineers.

The recommendations and specs drawn by these subcommittees then come up for full AEEC discussion at one of its three yearly meetings. Members are encouraged to speak out freely, and there is usually much give and take in AEEC deliberations.

If AEEC accepts a proposed characteristic, it is then submitted to the Arinc board of directors for approval. If granted, it is then submitted to the airlines and industry for 30 days. Barring a major "squawk," the characteristic is then formally issued. Preparation of the spec, from inception to issuance, may take a year or more.

►**Not Binding**—Issuance of an Arinc characteristic does not bind individual airline members to adhere to the spec when they purchase equipment. Rather it is intended to indicate to avionic equipment manufacturers "the considered opinion of the airline technical people, coordinated on an industry basis."

The Arinc spec is also intended to "channel new equipment designs in a direction which can result in the maximum possible standardization of those physical and electrical characteristics which affect interchangeability of equipment without hampering engineering initiative."

AEEC has or is currently preparing characteristics on such equipments as: VHF and HF communications, airborne radar, automatic direction finders, selective calling system, distance measuring equipment and tape reproducers.

►**AEEC Members**—Present members of AEEC, and their affiliations, are: C.C.E. Bellringer, IATA; H. A. Ferris, Trans-Canada; H.O. Harrison, Braniff; Col. L. J. Hipson, MATS; E. G. Jones, Delta-C&S.; M. E. Knox, Northwest; H. W. Mehrling, Eastern; B. F. McLeod, Pan American World Airways; W. D. Rollick, Piedmont; W. S. Smoot, Capital; F. J. Todd, United; J. L. Ware, National; F. C. White, ATA; R. N. White, TWA; H. A. Wolf, American; and W. T. Carnes, Arinc.

FILTER CENTER

►**British Autopilot for U.S.?**—Officials of Smiths Aircraft Instruments, Ltd., of London recently visited the U.S. to discuss with several manufacturers the possibility of building Smiths' SEP-2 automatic pilot under license. The SEP-2, which uses magnetic amplifiers throughout, has recently gone into production in England. It is slated for use on Comet IIs on order by British Overseas Airways Corp., as well as for several British military planes. SEP-2 is priced at about $13,000.

►**Transistor Handbook**—Transistor Application Notes, a handbook written to assist circuit engineers in applying transistors, has been published by General Electric. Copies can be obtained by writing to E. O. Van Deven, General Electric Co., Bldg. 7, Electronics Park, Syracuse, N. Y.

►**New 360-Channel VHF Receiver**—Collins Radio unveiled prototype of its new 51X 360-channel VHF receiver, with 50-kc. channel spacing, at the meeting of Arinc's Airline Electronic Engineering Committee in Kansas City. New receiver, slated for production next spring, is designed to new Arinc 520A characteristic. Unit weighs 27 lb., two pounds under weight of present 180-channel Collins 51R receiver, and will sell for approximately the same price as its 180-channel predecessor, a spokesman says. —PK

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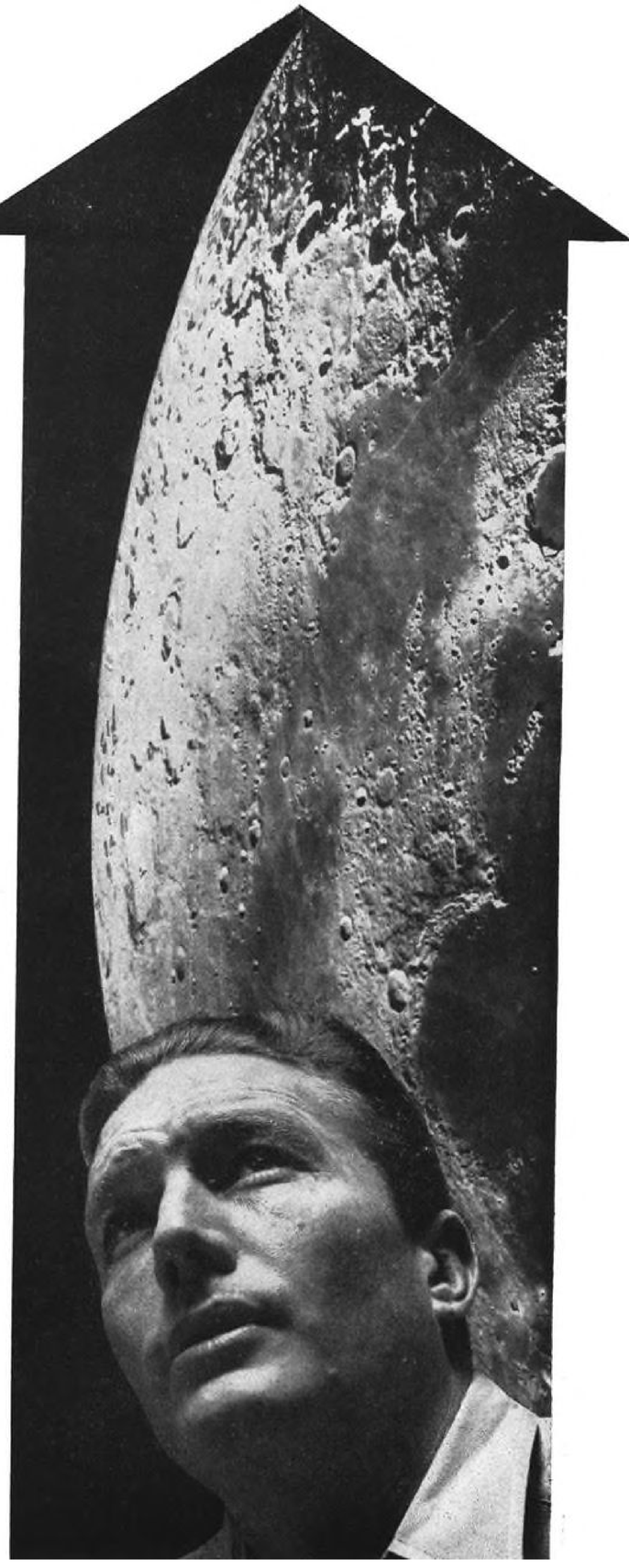

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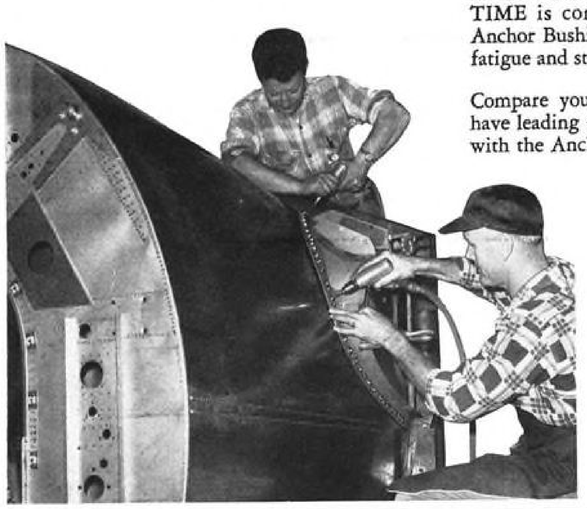

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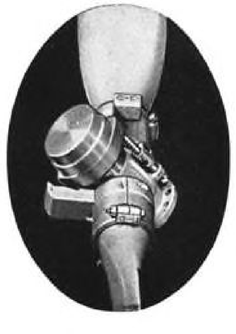

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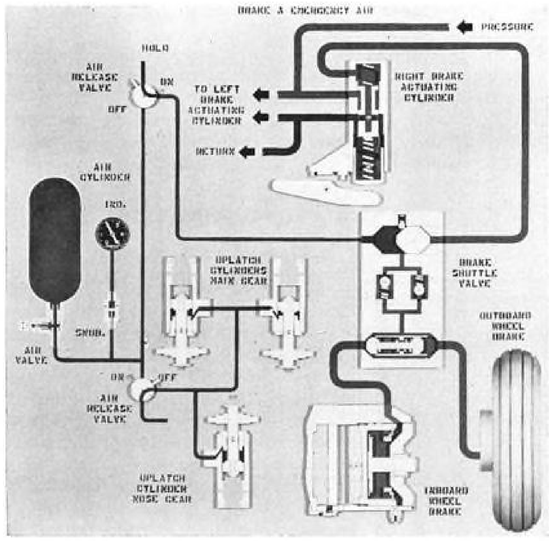

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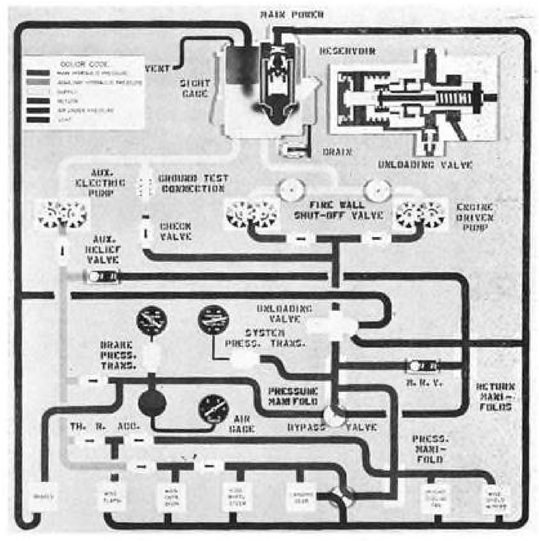


Brake and Emergency Air System Trainer

Animated Panels Explain Convair 340

The job of teaching new purchasers of the Convair 340 transport how the aircraft's various systems operate has been greatly simplified by the use of animated training panels.

Designed and produced by Technical Training Aides, Inc., the set of 16 panels were recently used to instruct personnel of Philippine Air Lines, KLM Royal Dutch Airlines and LAI (Italian Airlines). United Air Lines and Braniff International Airways have also used TTA's animated training panels for 340 instruction with considerable success; American Airlines used this type of trainer to indoctrinate its mechanics on CV-240s several years ago.

▶ **Clearer Picture**—The animated training aids show actual physical movement of the plane's many operating systems and components, such as door folding, cabin compressor system (which includes an enlarged operational gear animation to demonstrate the two-speed internal planetary gear train), main hydraulic power supply, and so on through all the systems of the aircraft. The visual presentation greatly simplifies the teaching and understanding of systems which are sometimes very complex.

The aids are lightweight and small. Each panel weighs about 50 lb. so that whole set of 16 weighs less than 800 lb. Standard sizes of the animated aids are 6x6 ft. and 6x9 ft.

▶ **Convenient & Inexpensive**—The panels are convenient and inexpensive. Each aid is a self-contained shipping container which requires but a few minutes to set up in a classroom for instruction.

Convair says that a complete training package consisting of the necessary number of instruction manuals, slides and charts along with the animated trainers can be supplied at less than the cost of three system trainers using actual parts.

The animated aids permit more instruction in less time than is possible with the utilization of real parts, Convair also points out. Time saving is largely due to the fact that in the visual training aids, system schematics are simplified, and complicated mechanisms may be enlarged to show their function more clearly than if the actual components were used.

▶ **Airlines Like It**—Here is what spokesmen for United Air Lines and Braniff have to say about the aids:

• **UAL.** D. L. McDaniel, technical training manager at the airline's main base at San Francisco, states: "In the opinion of our maintenance instructors, the trainers . . . were definitely of great help in the conduct of our CV-340 training program. The comments from the students who took the training program were almost universally complimentary."

• **BNF.** W. G. Mays, superintendent of training at Dallas, says use of the panels compels the instructor "automatically to give information which is at least 90% correct and to-the-point."

Follow-up mechanic training is simplified because men are shown the same panels that were used during original familiarization course, Mays says. Also, trouble-shooting manuals issued to each mechanic contain miniature duplicates of the mock-ups, "So, once again the mechanic has an 'on-the-job' set of the system schematics similar to those he studied in class, thus keeping 'schematic confusion' to a minimum."

Mays claims that use of the trainers has greatly increased the versatility of Braniff's technical instructors. And they now need a minimum of notes to supplement their lectures.

Braniff has found the initial cost of the panels is negligible when compared to savings realized through reduction in delays and manpower saving that results from having well-informed, well-trained mechanics on the job.

When made up prior to delivery of new model aircraft, trainers have the added advantage of providing a pre-training means to give initial mechanic indoctrination before he sees the new plane.

This was the method used by American Airlines in preparing its mechanics for the CV-240.

The 16 panels delivered to Convair

(initial sets were made up in seven weeks) include: door and stairway system; cabin compressor system; cabin pressurization and air conditioning system; cabin pressurization control system; wing and empennage anti-icing system; cabin temperature control system; generator control system; d.c. power supply system; hydraulic main power system; brake and emergency air system; nose wheel steering system; main entrance door and stairway hydraulic system; main landing gear system; wing flap system; ground cooling system, and windshield wiping system.

Technical Training Aids, Inc.'s headquarters is in Tulsa, Okla.

Fire Safety Bettered In New Turbine Units

Two new gas turbine auxiliary power units put out by AiResearch Manufacturing Co. enclose hot parts of the turbine and nozzle box in a pressurized chamber for better fire safety.

One unit is a 170-pounder, whose function is to supply compressed air. Output rating is roughly equivalent to 170 hp. The other machine supplies both compressed air and shaft power with a total output of about 120 hp.

Stainless steel and aluminum enclosures have been eliminated in both units, but they remain fully automatic, self-contained machines. Elimination of enclosures reduces weight, increases machines' ease of installation, simplifies maintenance and reduces operational problems induced by vapor lock, AiResearch says.

Dual ignition and need for cross-firing means or fuel-flow equalizers are eliminated by use of single combustion chamber. Flame tube may be taken out and turbine nozzles inspected by removal of a single clamp.

Reinforced Plastics Make Tray Carriers

Reinforced plastic food tray carriers are replacing wood-lined aluminum carriers on American Airlines' fleet of Convair aircraft.

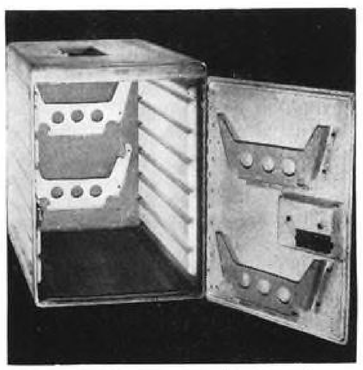
The new units are lighter, cheaper, simpler and stronger, according to American Cyanind Co., which makes the Laminac polyester resin that is used to make them.

The new carriers weigh about 15 lb., three pounds less than the aluminum units. Their design permits three to do the job of four, so total weight saving is about 27 lb. per plane. AA estimates that this weight saving amounts to about $14.50 per pound per plane per year.

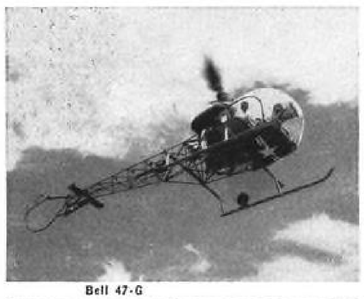
The carriers are of single-wall construction. Fabricated almost entirely by molding, they are simply built and solid. Only added parts are stainless steel hardware and four molded glass-mat-and-plastic dry-ice containers. The latter are attached to inside of back wall and to the inside of the door.

Being molded of Laminac polyester resin and fibrous glass, the carriers have good impact resistance if dropped, withstand scuffing, heat, moisture, frequent autoclave washings, etc. They also have good insulating properties.

The containers were developed by American Airlines and Steiner Plastics Manufacturing Co., Glen Cove, L. I., N. Y. The latter also fabricates the units.



NEW TRAY carrier for AA Convairs.



Bell 47-G

McCulloch MC-4

Sikorsky S-52

Hiller 12-B

4 out of 5

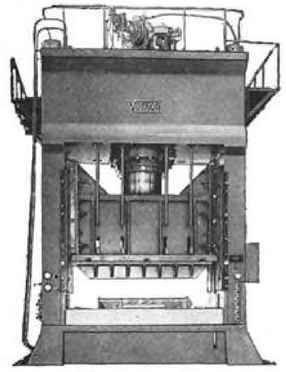
CAA- Certificated Helicopters under 400 h.p. have

Franklin POWER

AIRCOOLED MOTORS, INC. SYRACUSE, N. Y.

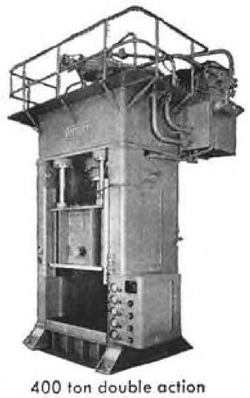
FROM TRADE Verson MARK

A COMPLETE RANGE OF HYDRAULIC PRESSES



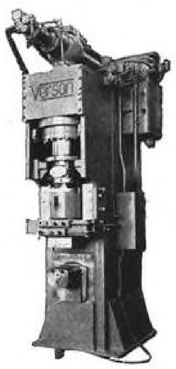
1200 ton straight side

750 ton post type

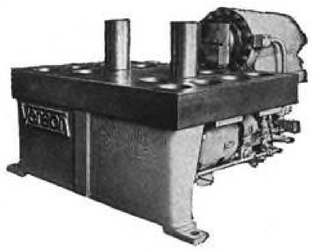


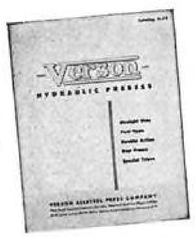
400 ton double action

400 ton straightening press



300 ton horn press



200 ton bending press

Write for your copy of the new Verson Hydraulic Press Catalog which contains detailed data on the entire Verson hydraulic line.

In the Verson line of hydraulic presses, there is a size and type to meet virtually every need from 75 tons up. In addition to the more common types illustrated above, Verson also manufactures such special models as gap type presses, bulldozers, hobbing presses, rubber pad cutting presses and pipe forming presses. If there is a question as to whether a mechanical type or a hydraulic type is best for your job, Verson, as a leading manufacturer of both types, is able to make unbiased recommendations.

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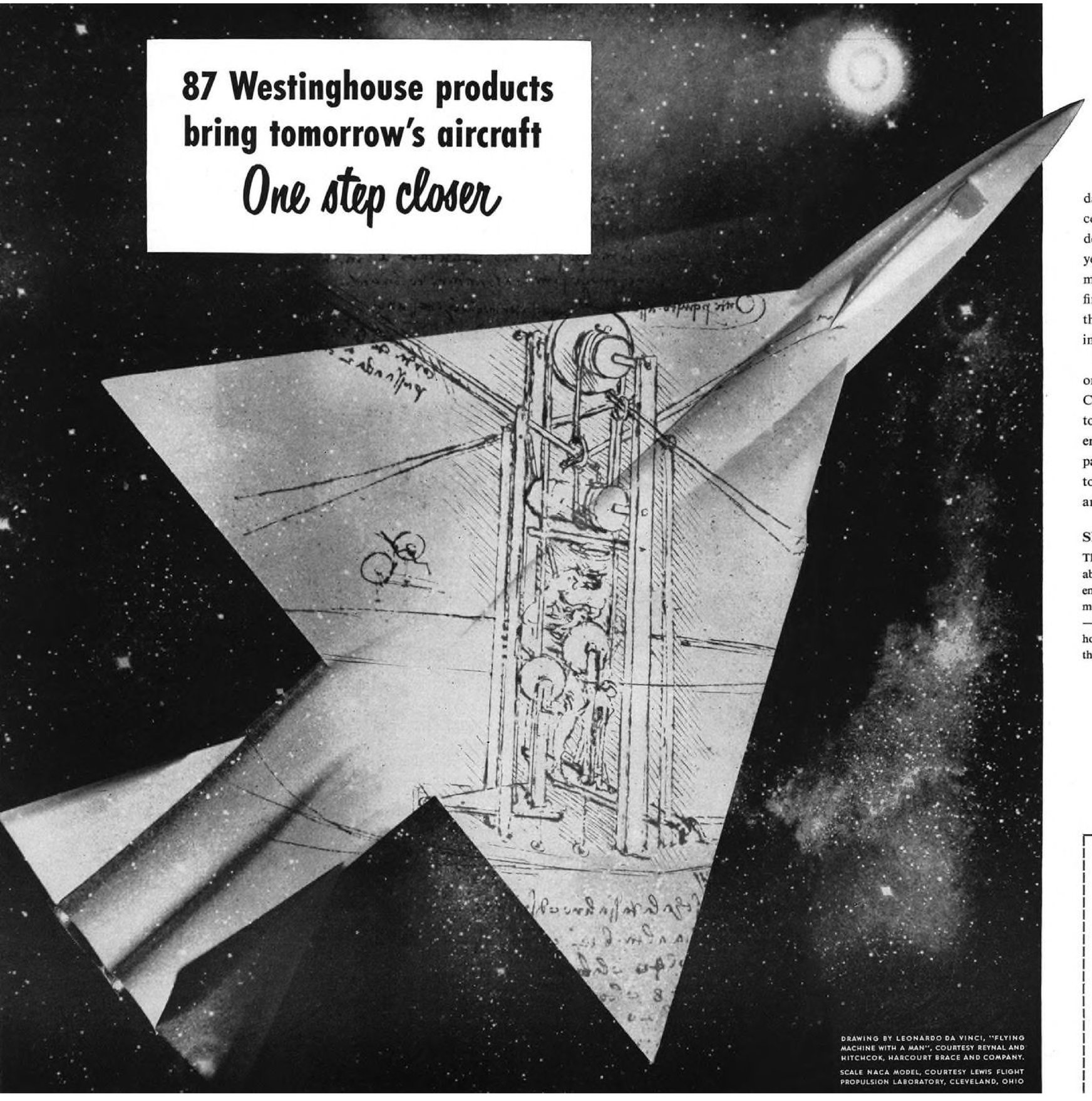

DRAWING BY LEONARDO DA VINCI, "FLYING MACHINE WITH A MAN", COURTESY REYNAL AND HITCHCOK, HARCOURT BRACE AND COMPANY.

SCALE NACA MODEL, COURTESY LEWIS FLIGHT PROPULSION LABORATORY, CLEVELAND, OHIO

da Vinci's concept never envisioned the supersonic age . . . or the complexity of modern aircraft. But in this "Span of Flight", aviation designers have telescoped centuries of normal evolution into fifty short years of accelerated progress. 87 Westinghouse products have helped make this possible. Yes, it's true, between Magamps . . . turbojets . . . fire control radar . . . electrical systems . . . aircraft motors and Micarta® there are 87 different Westinghouse products helping the aviation industry bring tomorrow's aircraft—One Step Closer.

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New Oil Additive Inhibits Engine Rust

A new, rust inhibiting oil additive, particularly indicated for use in internal combustion, jet, diesel and gasoline engines, turbines, pipelines and ferrous tools or components in the production stage, has recently been put on the market in commercial quantities by the Atlas Powder Co.

The firm says that the inhibitor, Atpet 100, "provides freedom from pre-ignition and other undesirable effects of ashy residue encountered with sulfonic inhibitors containing the salts of such metals as sodium, calcium or barium." Atpet 100 is a sorbitan mono fatty acid ester similar to Atlas' Span 80, used in many military applications. The maker points out, however, that the new inhibitor's "performance and economy . . . show substantial improvement over Span 80 under many conditions."

Shipped as a concentrate for the refiner or compounder to add to his oil, the inhibitor has been put through extensive laboratory tests. These tests show that Atpet 100 provides improved protection even when used in reduced concentrations and that it gives consistently uniform action, Atlas says.

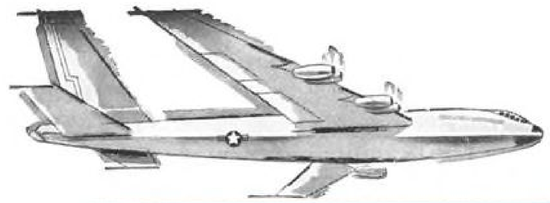
In a standard humidity cabinet test, Atpet has withstood 634 hours' exposure at 1% concentration in oil, or nearly double that obtainable with earlier inhibitors, the maker claims. The new product also behaves well in highly refined oils which tend to resist the action of inhibitors.

Samples and literature are available from Industrial Chemicals Dept., Atlas Powder Co., Wilmington 99, Del.

OFF THE LINE

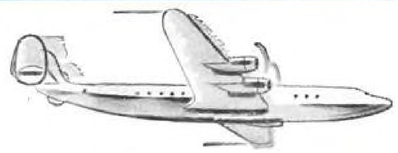
Lockheed Aircraft Service-International, N. Y., has leased 50,400 sq. ft. of hangar and shop space from National Airlines at N. Y. International Airport (Idlewild). Additional ramp and apron area totaling 122,000 sq. ft. and an employe car park of 30,000 sq. ft. has also been leased by LASI at the facility.

Northwest Orient Airlines is service-testing seven CB-2 models of the Pratt & Whitney Aircraft R4360 engine on its Boeing Stratocruisers to determine if this model of the engine with its increased cylinder fin area (providing better cooling) and improved exhaust system design giving greater cruise power potential, should replace the B-6 version of the engine now being flown by NWA. Service tests will be completed in about six months. If successful, the CB-2 will replace the B-6 on an attrition basis.



EVERY TYPE OF PLANE . . . IN

EVERY TYPE OF SERVICE



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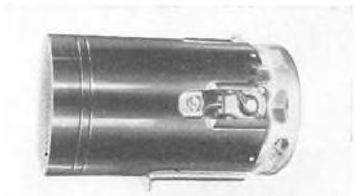


Small Compressor for Pneumatic Systems

Rhodes Lewis Co. announces production of a high-pressure d.c.-driven air compressor which reportedly provides a complete, self-contained air source for pneumatic systems in aircraft. This compressor is used in Lockheed, Martin and Grumman aircraft, the company says.

Affording space and weight reduction, the unit forms an integral package, embodying all accessories and controls. It is described as a timesaver in maintenance and upkeep—it can be removed or installed in aircraft in under five minutes.

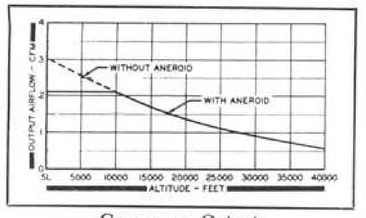
Manufacturer lists hydraulic model as an example of compactness of units. This compressor's capacity is 3 cfm. at 3,000 psi., but it weighs only 23 lb. and complete package fits into area 10 in. in diameter by 13 in. high.

Saving in height, weight and friction load is effected by cross-yoke construction between two sets of opposing cylinders. This eliminates two connecting rods for the four pistons. Further saving is permitted through use of a planetary reduction gear, used between drive motor and compressor.

Rhodes Lewis states that piston length to stroke ratio is held to a minimum. Smaller ratio permits use of shorter length cylinders, does not cause excessive wear since cross-yoke design creates piston length equal to length of entire yoke assembly.

Metal-to-metal seals are used between cylinder, valve plate and cylinder head in all four stages to lessen space requirements. Inlet and exhaust valves also furnish metal-to-metal seals.

Manufacturer reveals that current production is limited to d.c. motor,



Compressor Output

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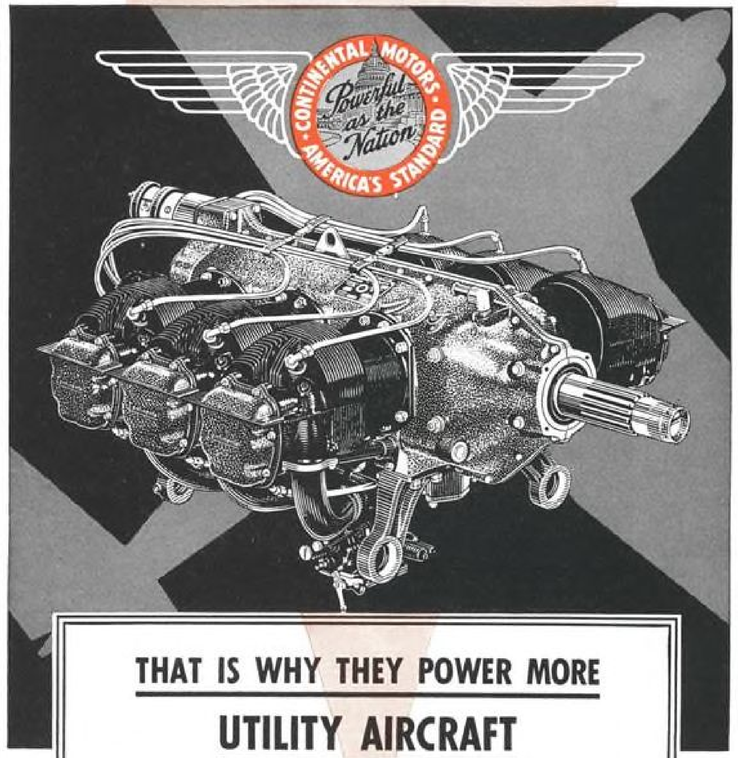

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The 1902 Wright Glider was tested as a kite and then flown with a man aboard. The following year the Wrights designed a propeller, built an engine, and made their historic first flight.

What shape should a wing be? What pitch should a propeller have? Is a tail needed? No one knew the answers when Wilbur and Orville Wright were developing their airplane. By comparison, the propeller problem seemed easy. So the Wright brothers left this "easy problem" till last and concentrated on wing camber, elevators, and rudders, making their 1902 Glider aerodynamically sound. Used in the first planes manufactured, OSTUCO Tubing has become the standard of quality for fuel lines, landing gear, engine mounts, and other applications requiring ease of machining plus exactness in forming and fabricating.

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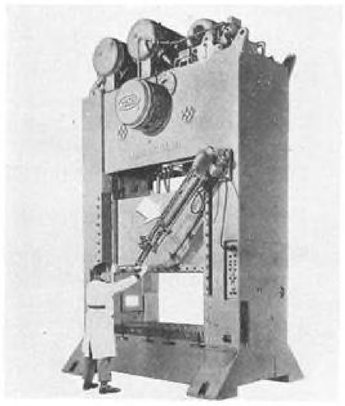
with a.c. and hydraulic drives currently undergoing qualification tests.

Rhodes Lewis Co. (subsidiary of McCulloch Motors Corp.), Los Angeles Calif.



Adjustable Positioning Bar Controls Press Movement

An adjustable control bar for positioning run and stop buttons of a press is featured in a new press operation method developed by Danly Machine Specialties, Inc.

Bar is suspended by universally adjustable telescoping arm. With each change of dies or operating procedure, bar can be relocated, with a resultant saving in motion and time. Operator efficiency and safety are said to be greater. For changing dies, arm is swung completely free of working area.

Major movements of unit are made with worm gearing, turned from hand wheels near control buttons. Height and position of buttons are quickly adjustable. Finger grips above run buttons permit relaxing of operator's arms during operation. Maximum safety is assured by sufficient spacing of buttons to require two-handed operation.

Danly Machine Specialties, Inc., 2100 South Laramie Ave., Chicago 50.

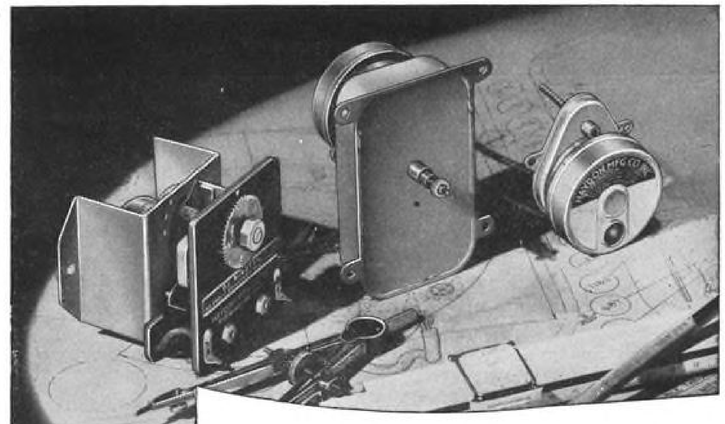
Efficiency Raised in New Explosion-Proof Motors

A new line of explosion-proof polyphase a.c. motors that offers better protection, greater efficiency and quieter operation has been announced by General Electric Co.

Designated Tri-Clad 55, the motors are 50% smaller and are 22% lighter per horsepower than previous models.

The new units incorporate a new insulation system, bearing assembly and ventilation plan.

Core of the insulation system is a new polyester film, said to be eight times stronger than materials previously used. Main function is to insulate points of hardest motor wear—the



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The knowledge and skill of our field engineers and our research and engineering facilities are available to help you solve timing problems. Write us in detail or ask that we send a field engineer to talk things over.

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TORRINGTON, CONNECTICUT

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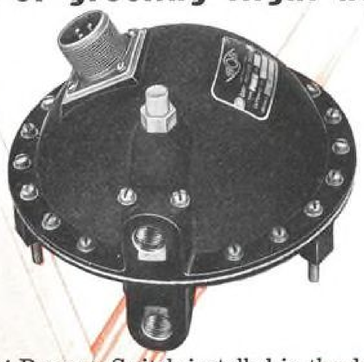
P-904 PRESSURE SWITCH

stands up under

thousands of grueling flight hours!



An Aerotec P-904 Pressure Switch installed in the de-icing system of a Boeing Stratocruiser performed without any functional failure during thousands of flight hours. Upon removal, no drift in the pressure setting had occurred, and the unit was still in excellent condition.

Frequently used in the de-icing or cabin-heater systems of larger aircraft, the Aerotec P-904 Type Pressure Switches are also utilized to control ground heating blowers as well as flap, landing-gear and stall-warning devices.

Among the aircraft using Aerotec P-904 Type Pressure Switches are: Boeing B47 Stratojet and B50D Superfortress, Grumman XS2F, Douglas C124C, North American AJ-1 and Chase C123B. More than 15,000 units are in service today.

The exhaustive and conclusive tests of Spec MIL-E-5272 which the P-904 has successfully passed guarantee that Aerotec Automatic Controls will satisfy even the most rigorous specifications.

Aerotec Pressure Switches of various types are available for pressures ranging from 1.5″ H_2O to 3,000 psi.

Let our qualified engineering help solve your automatic control problems in the aircraft field. Why not contact us on your pressure switch problems?

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phases and slot tubes in the stator.

New bearing system is better sealed, is lubricated by grease said to last five times longer than any previously used. Motor is uniformly cooled through double-end ventilation system. Air is drawn in from beneath both endshields, through baffled air passages and out louvers on sides of frame.

Larger, integrally-cast rotor fans increase cooling air flow through motor and reduce rotor heat more effectively. GE engineers say that through new endshield and frame design, protection has been increased by 60% on the drip-proof enclosure.

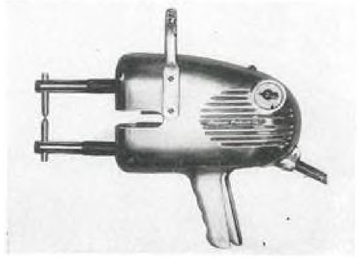
Noise levels were a big consideration in the motor design. GE says that the noise level of the new 10-hp. motor now tests as low as the former 2-hp. model.

Improved maintenance features, in addition to the long-life lubricating grease, include permanently numbered, non-wicking connection leads, larger diagonally split conduit box, knockoff lugs on end shields, and location of combination nameplate-connection diagram directly over box.

GE emphasizes that although size, weight and design have been drastically changed, the Tri-Clad 55 line has high efficiency and will operate under greater full-load speed conditions than the former design.

The motors will be available in 182 and 184 frame sizes (1, 1½ and 2 hp. at 1,800 rpm.) in horizontal, drip-proof and totally enclosed fan-cooled models, and a complete line of gear motors. Larger frame sizes will be put out at regular intervals.

General Electric Co., Small Integral and Medium Induction Motor Depts., Schenectady 5, N. Y.



SELF-TIMING WELDER

Wall timer is eliminated with this portable spot welder which has its own electronic timing control enclosed. It offers time cycle from 1/60th of a second to a full second, has output of over 10 kva. Pistol grip eases awkward position welding. It welds most alloys of aluminum and various forms of steel, including stainless. The unit welds thicknesses up to 3/16 in. and weighs 26 lb. Made by Ampower Products Co., 5737 W. 87th St., Oak Lawn, Ill.

The *Beaver* (L.20)

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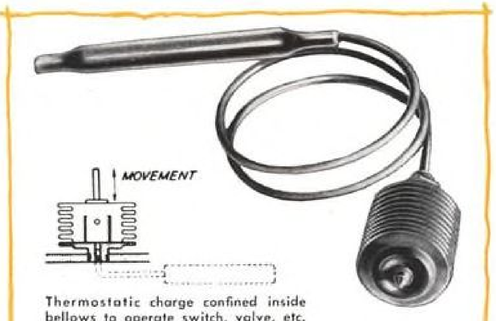

Thermostatic charge confined inside bellows to operate switch, valve, etc. Bulb optional.

● If you use or need bellows assemblies, check with the specialists at Fulton Sylphon or Bridgeport Thermostat. Our more than half-a-century of experience in this specialized field can be a big help to you.

For one thing, we can take care of your bellows assemblies requirements quickly and accurately—help you save time, production problems and expense.

Or, if you require a specific type of assembly, our specialists will work with you to design and produce exactly what you need.

Sylphon and Bridgeport bellows assemblies are used to help solve many design problems involving control of temperature or pressure. Typical examples of their use are: as flexible connectors, for thermostatic devices, hydraulic mechanisms, expansion joints, pressure controls. Wide range of metals and sizes.

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TWIN-ENGINE PIASECKI YH-16 helicopter would handle shorthaul airline traffic, team up with longhaul fixed-wing transports.

Carriers Outline Helicopter Requirements

- **Airlines want realistic safety, 30-place craft.**
- **Piasecki cites twin-rotor reliability, performance.**

By Lee Moore

Principal airline requirements for a paying helicopter operation are realistic safety regulations and a payload of 30 or more passengers, discussions before the American Helicopter Society's southeastern regional meeting reveal.

Lee Douglas, engineering vice president of Piasecki Helicopter Corp., presented a detailed analysis of commercial copter development trends and payload problems.

Capt. Byron Moe, operational planning director of Allegheny Airlines, outlined local service requirements for a self-supporting copter.

► **Engineer's View**—Douglas' paper indicates that a twin-engine helicopter will be safe and economic if the basic

LARGE CAPACITY of YH-16 is emphasized in view showing three jeeps stowed inside.

UNDERGOING TESTS, YH-16 sets a pattern for future large airline-type copters.

RIGID HOVERING requirements could seriously hamper payload-to-power ratio.

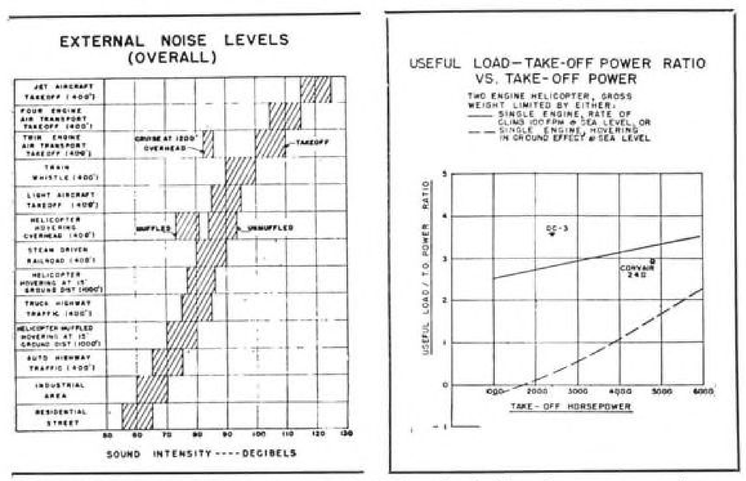
airworthiness requirement is a single-engine climb of 100 fpm., rather than a demand that the craft be capable of sustained single-engine hovering.

Proper heliport design and takeoff technique will make 100 fpm. a safe minimum, he says. The more rigid hovering requirement would cut payload-to-power ratio almost in half.

The Douglas paper, Shorthaul Helicopter—An Engineer's View, highlights:

• **Load-power ratio.** Useful load ratio to military power for new twin-engine helicopters is not substantially different from higher-powered, single-engine craft. But twin-engine copters' single-engine performance safety factor will govern its commercial economics.

Douglas notes that Los Angeles and New York Airways have established safe routes for single-engine copters. "It is thus possible that operational comprom-



OPERATIONS GRAPHS show noise levels (left) and takeoff performance comparisons.

ises would be more economic than a new helicopter designed to optimum traffic considerations," he says. Backward takeoffs over obstacles permit safe landings with one engine out by coasting down forward to land at the original takeoff spot.

• **Inside noise.** Passengers will stand a higher noise level in a 15-min. copter flight than during a 2-hr. flight in fixed-wing transports. Cutting interior noise level 10 decibels in the 1,000 cycles/second frequency regime would take about 250 lb. of insulation.

• **Vibration.** Closer attention to rotor mountings, pylon natural frequency, fuselage natural frequency and engine isolation will be needed to reduce copter vibration much below present levels.

• **Radio.** Presently installed equipment has enabled rotary-wing aircraft to perform all required military missions, so engineers believe that no serious communications problems should be anticipated in integrating helicopters and airplanes in busy airport traffic operations.

• **Outside noise.** Main source of objectionable noise is the engine exhaust. Obvious solution is muffling, which involves weight, power and drag penalties. Muffler now being developed for the H-21 will have a back pressure of 6 in., weigh 150 lb., and reduce noise 10 to 15 decibels. This changes the noise from an unacceptable to an acceptable level, Douglas says.

• **Speed.** Forward speed does not improve shorthaul copters' block-to-block time much but is an important factor in making schedules against headwinds and when flight distances are increased. Speed of 175 mph. is well within rotor possibilities today.

▶ **Airline Requirement**—Capt. Moe reveals the type copter Allegheny desires:

• **Operating cost** of $1.20 per plane-mile on flights of 50 to 75 mi.

• **Payload** of 28-32 passengers.

• **Range** of 200 mi., carrying adequate fuel reserves and maximum payload and making six intermediate stops.

• **Heliport** size requirement of 300 to 400 ft. square (90,000 to 160,000 sq. ft.).

• **A 150 mph.** speed minimum.

• **Airworthiness** meeting Civil Aeronautics Administration's transport safety category.

• **Anti-icing** will be presumed necessary until proved otherwise.

• **Engines** should be left up to manufacturer selection, but airlines will require single-engine performance maintaining level flight at reduced speed.

• **Instrumentation** about the same as in existing planes. Instruments are an optional choice, but all-weather capability probably will be required.

• **Ventilation and cooling** will be vital, because of the copter routes' low-level, up-and-down nature.

• **Noise control** is a must, because the entire principle of copter time savings is movement in and out of crowded, downtown terminals.

• **External appearance** of the copter should not "amuse, confuse and frighten" customers.

▶ **Stability Problem**—Cmdr. Peter Torry of the Navy's Bureau of Aeronautics anti-submarine helicopter desk challenged the industry to concentrate on inherent stability above all other requirements.

He cites Navy's anti-submarine requirement for a copter to skim the water at 50 ft. altitude through all weather and around the clock. No helicopter in production—with or without autopilot—can do that, he says.

Capt. Moe replied that local service airlines do not need the same refinement of stability as Navy's specialized anti-submarine water-skimming requirement.

"We don't discredit the airworthiness requirement," he says. "In fact, the airlines' put prime emphasis on that."

Piasecki says a simple autopilot can achieve stability and reliability, as shown by the record of its HUP equipped with a Sperry A-12.

Brazil's Airlines Ask Rate Increase

(McGraw-Hill World News)

Sao Paulo, Brazil—Brazilian airlines have told the government they require a minimum 70% increase in fares to stay in business.

The reasons: increased wages, higher cost of fuel beginning in December, increase in cost of aircraft, parts and equipment.

Several foreign carriers—including KLM Royal Dutch Airlines and Air France—reportedly have boosted fares 20%, but the director of Brazil's Civil Aeronautical Department says he is unaware of any authorization permitting these companies to increase their rates in Brazilian territory.

Experts Study Runway Economies

Substantial reductions may be possible in airport construction costs by making the shoulders of runways thinner than the more heavily traveled center portions, reports the University of California's Institute of Transportation and Traffic Engineering.

Analysis of 750 landings and takeoffs at Oakland, San Francisco and Los Angeles Airports is being conducted by the institute to determine whether planes make much use of the runway shoulders.

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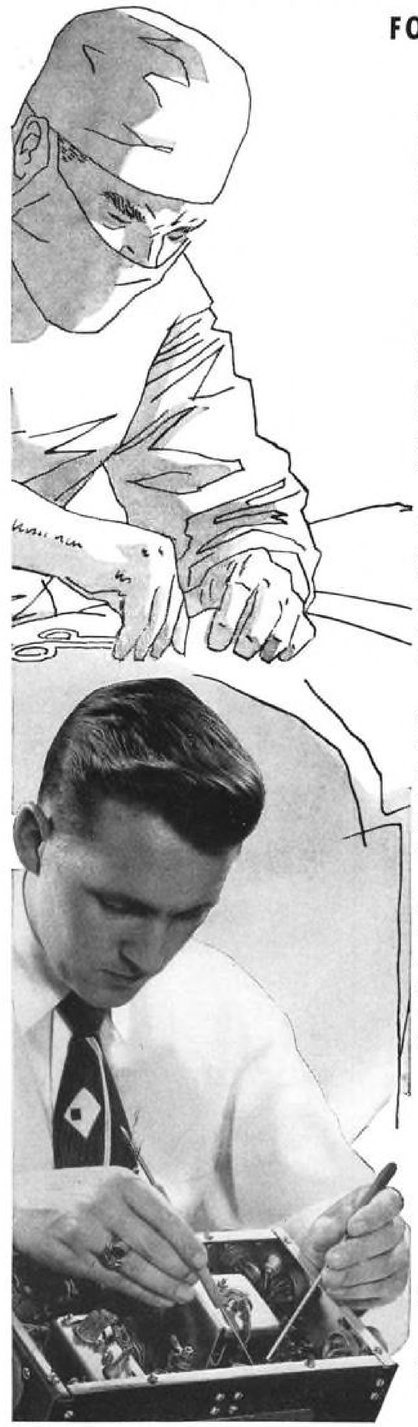

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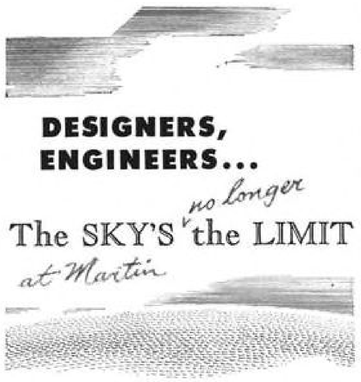

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CAB ORDERS

(Nov. 2-9)

GRANTED:

New York-Chicago route case intervention by Grand Rapids, Kenty County and Lansing, Mich.; Rochester and Syracuse, N. Y.; Michigan Department of Aeronautics; Seattle, Wash.; Portland, Ore.; Chicago Committee on Aviation and Youngstown, Ohio.

North American Airlines route application amendment to make both Los Angeles and San Francisco terminals for Chicago-Kansas City-Denver service. Wording of previous application inadvertently made Los Angeles an intermediate stop en route to San Francisco.

Western and Continental Air Lines' applications for consolidation of Salt Lake City service in Denver service case.

Pan American-American Overseas flight engineer job integration.

National Airlines permission to give free transport to Convair and Douglas technicians for six-month period of inflight observation of new Convair 340s and Douglas DC-7s.

Bonanza Air Lines permission to start serving Death Valley, Calif.

Allegheny Airlines hearing on application to serve Clearfield-Dubois-Philipsburg, Pa., through use of Philipsburg Airport.

Greater Rockford Airport Authority intervention in Braniff Airways Route 106 renewal case.

Post Office Department intervention in South Atlantic route renewal case.

APPROVED:

Consolidated Airfreight tariff agreement providing that parties failing to pay share of costs promptly shall be dropped from the contract tariff arrangement.

International Air Transport Assn. agreement on special Class B fares in the Middle East.

CEASE AND DESIST:

Airline Reservations, Inc., from representing firm as an airline instead of agent, making false representations on type insurance available to passengers, representing its tickets as valid airline tickets.

DISMISSED:

Pacific Northern Airlines complaint against Northwest Airlines' reduced off-season first-class fares between Anchorage, Portland, and Seattle.

Central Airlines application in route renewal case for temporary certificate to various additional cities in Missouri, Kansas and Oklahoma—withdrawn at company request.

Transport Airgroup, Inc., application to serve Lake Central Airlines routes—withdrawn at company request because company now is consolidated in the Lake Central acquisition investigation.

Robin Airlines application in large irregular carier investigation—withdrawn at company request.

DENIED:

Rock Island County, Ill., Metropolitan Airport Authority motion for consolidation in Braniff Airways Route 106 renewal case.

National and Delta-C&S Air Lines protests against Eastern Air Lines use of 88-passenger Super Constellations in daylight aircoach service.

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Business Flying Aids Airport Improvements

Five business aircraft owners have signed longterm agreements with General Aviation, enabling the operator of Lost Nation Airport to launch an extensive improvement program at the Willoughby, Ohio, airfield.

Airport president William McNeely reports the agreements assure a regular annual income to the field, providing basis for a bank loan.

The program will include a 4,500-ft. hard-surface runway to replace Lost Nation Airport's sod landing strip, complete night lighting system, and a high-frequency radio homing facility.

"Hard-surface runways and improved radio aids have always been on our longterm program," McNeely says, "but the new agreements make them possible sooner than we had hoped."

Business aircraft operators that signed the agreement: Diamond Alkali Co., Eaton Manufacturing Co., M. A. Hanna Co., Lubrizol Corp., and Thompson Products, Inc.

USAF Trims Pacific Airlift to Five Lines

A streamlined Pacific airlift, geared to the present reduced requirements of the Air Force, is operating to the Far East with only five of the original 11 airlift contractors participating.

Awarded by Air Materiel Command, the new contract holders and their roles are:

• **Mid-Pacific route** via Hawaii and Wake Island to Tokyo: Slick Airways, one DC-6A, cargo; Transocean Air Lines, five DC-4s, passengers and cargo; Seaboard & Western Airlines, six DC-4s, passengers; Flying Tiger Line, four DC-4s, passengers and cargo; Overseas National Airways, four DC-4s, passenger.

• **North Pacific route** through the Aleutians to Tokyo: Slick, one DC-6A, cargo; Seaboard & Western, two DC-4s, passenger and cargo.

In calling for new bids (on a four to 10-plane basis), AMC thus terminated with the 11 original airlines leases that would have expired Dec. 31.

Loss of airlift contracts forced nonsked California Eastern Airways to layoff 210 employees and Pan American World Airways to schedule 89 co-pilots for furlough Dec. 20.

Neil Berboth, vice president and assistant general manager of CalEastern's Oakland, Calif. base, says the move cuts its air carrier business to operation of one DC-4 on domestic service.

► **Figures Revised**—Four of the contract winners began operations Nov. 1. At that time, USAF believed only four carriers would be required to haul passengers and cargo on the airlift which has been substantially reduced because of the Korean truce.

However, one week after the decision was made, the Joint Military Transportation Committee of the Joint Chiefs of Staff revised its figures and another carrier was sought.

Because Overseas National was the next lowest bidder of the original 11 contractors, that airline won a contract to use its four DC-4s, which are leased from USAF.

► **Court Case Dropped**—ONA earlier had filed a complaint against Air Force in District Court, Washington, (AVIATION WEEK Nov. 2, p. 17) protesting USAF's recent decision to increase C-54 rentals from $3,000 to $12,300 per plane per month.

The nonsked airline refused to sign its new lease with Air Force, claiming that by so doing it would be thrown out of business without a government contract. While Air Force attorneys were preparing an answer to the airline complaint, ONA won its new contract, signed the new lease and dropped its court action.

► **Nine Leases Signed**—Thus far nine of the 11 airlines operating USAF C-54s have signed the new leases. These are: Trans World Airlines, two; Great Lakes Airlines, one; Viking, one; Seaboard & Western, one; Transocean, one; Flying Tigers, two; George Enloe, Burbank, Calif., two; Frances Christmas, Anchorage, Alaska, two; and Overseas National, four.

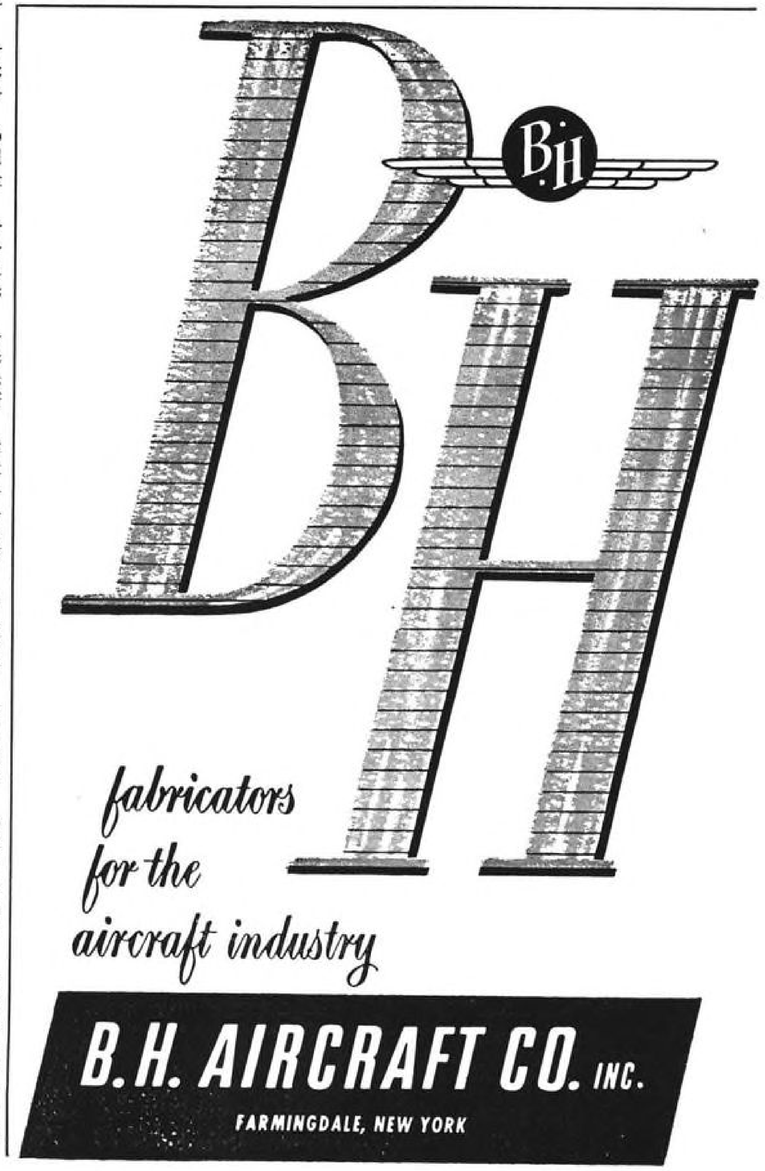
Northwest Airlines, which operated five C-54s under the old lease, still is negotiating a new lease with USAF, an NWA official said last week.

PAA, which leased 16 C-54s under the old program, also is negotiating a new lease and has indicated it may decide to return some of the aircraft to Air Force.

CAB Forces AA To Cut Coach Rate

Trips on short segments of longhaul aircoach flights will cost 4½ to 5 cents a mile instead of 6 to 6½ cents, following American Airlines' capitulation to CAB in the shorthaul coach investigation.

On the day of scheduled hearings, after CAB refused American offers of compromise at about 5 cents and more per mile, the airline agreed to file coach tariffs on New York-Washington and New York-Boston segments of its transcontinental coach flights. CAB officials said they believed Eastern Air Lines would follow.



Turbines, Low Fares Spur BEA Business

A combination of tourist fares and the introduction of turboprop-powered Vickers Viscounts on British European Airways Corp.'s most competitive routes have produced sizable gains in passenger traffic.

• **London-Geneva and London-Zurich**—7,660 passengers in September 1953, compared with 3,316 in the same month a year ago.

• **London - Stockholm - Copenhagen**—3,047 passengers, against 1,662 flown in September 1952.

The airline still operates some Airspeed Ambassador Elizabethan-class piston transports on Swiss routes.

ICAO Names Loaeza Air Transport Chief

Dr. Enrique M. Loaeza, Mexico's representative on the International Civil Aviation Organization's Council, has been appointed chairman of the Air Transport Committee.

The committee is a subsidiary body of the Council and deals with economic problems of international air transport.

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SHORTLINES

► **Air France** is operating both Turbo Compound Super Constellations and regular Connies on its new Chicago-Paris service (AVIATION WEEK Sept. 28, p. 84). Company says the service cuts several hours from routine routing via New York.

► **Air Transport Assn.** has published its Origination and Destination Airline Traffic Survey of Revenue Passengers of September 1952. The four volumes: 1, Summary of Domestic Traffic; 2 and 3, All Domestic Airline Passenger Traffic Between Terminals; 4. International. Sets cost $25.

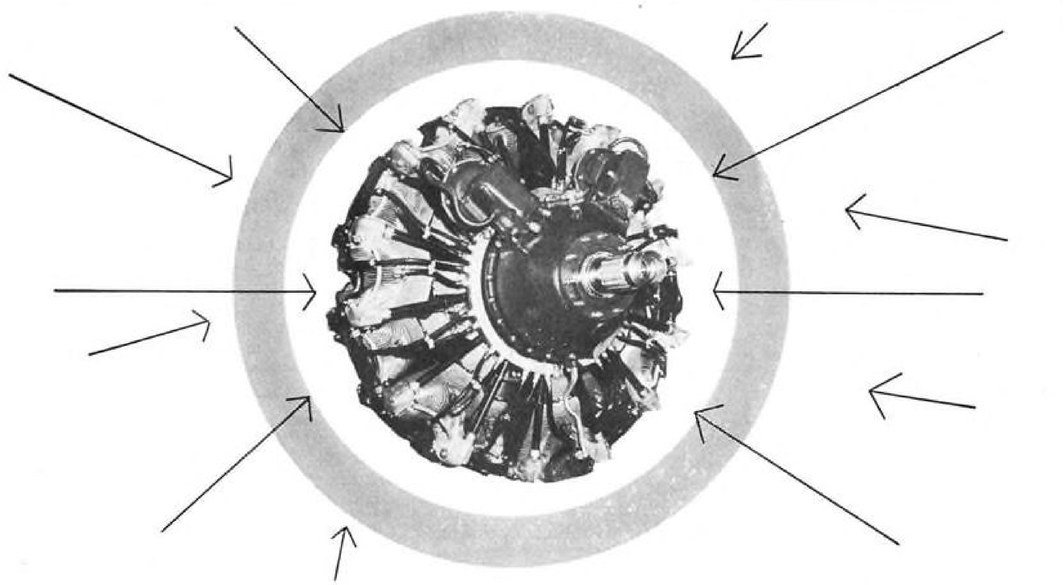
► **California Air Service Co.** has started air taxi and air ambulance service from Oakland Municipal Airport with two Howards, a Stinson, Aeronca and Cessna.

► **Civil Aeronautics Administration** is experimenting with a new commercial pilot examination. It poses practical operation and navigation problems with reference material available, instead of questions and answers that can be memorized. CAA says it will decide early next year whether to adopt the new exam as the standard. . . . CAA reports the number of aircraft fix postings by air route traffic control centers increased 13% from fiscal 1952 to 1953, with 12 of the 31 ATC centers handling more than 500,000 postings in the year. Main increases: Atlanta, 28%; Jacksonville, 29%; and Los Angeles, 22%. . . . CAA has issued its 1953 statistical handbook on civil aviation—the first published in two years. It covers passenger, airfreight and other payload statistics, airports, federal airways, aircraft and airmen certifications, general aviation, aeronautical production and exports and accidents. Cost is 40 cents from the Government Printing Office, Washington, D. C.

► **Northwest Orient Airlines'** revised winter schedule puts Stratocruisers on Chicago-Twin Cities and Chicago-Seattle flights.

► **Trans World Airlines** has bought 13 complete pressurization systems from AiResearch Manufacturing Co. for conversion of fair-class Constellations to aircoach passenger density. TWA so far has bought 32 such pressurization systems for coach conversions.

► **United Air Lines** plans to build a $450,000 office and accounting building next to executive headquarters in Chicago, has scheduled it for completion in July of next year.



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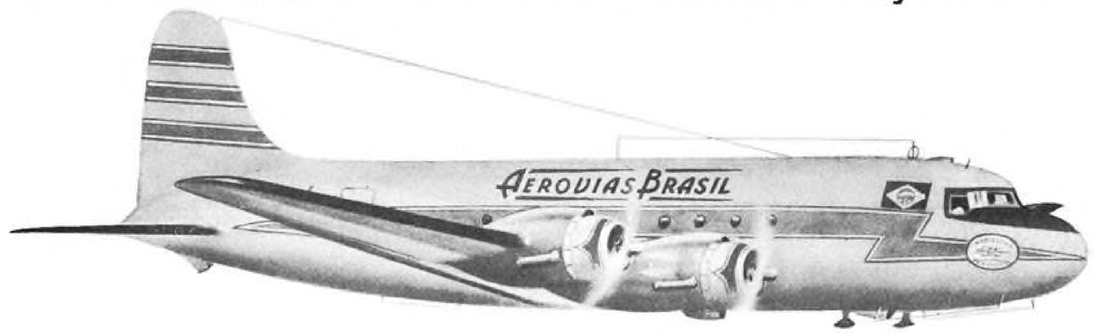

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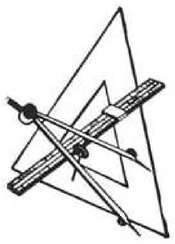

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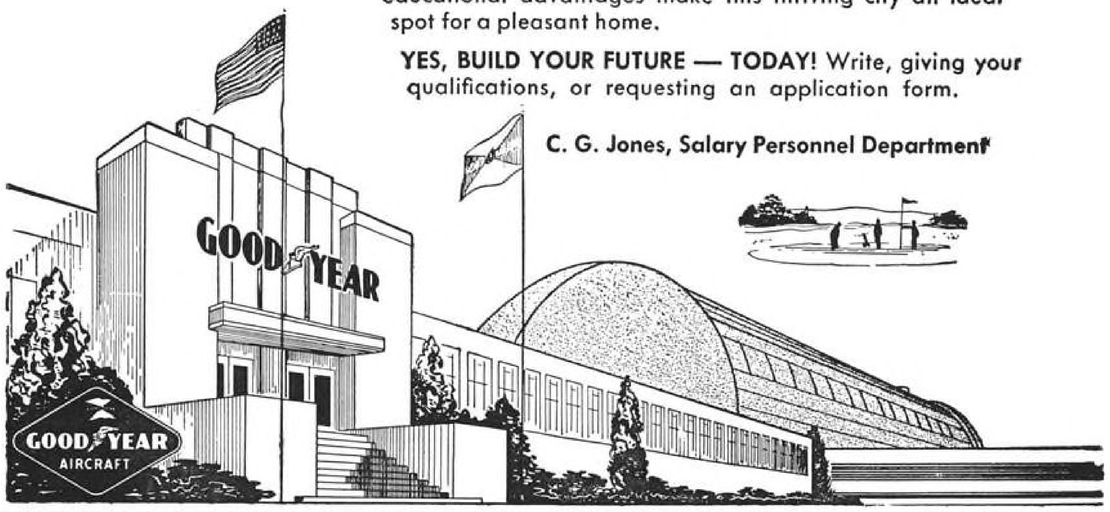

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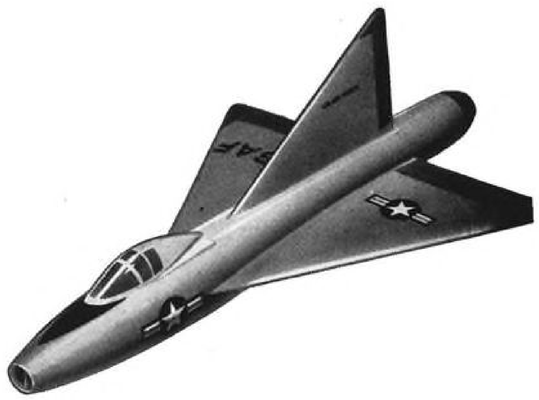

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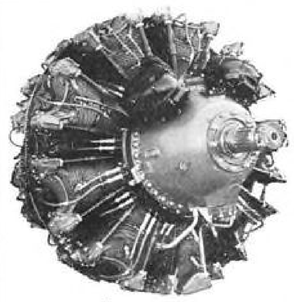

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NEWS SIDELIGHTS

German designer Willy Messerschmitt told West Coast newsmen his firm produced 600-800 of the ME-262, only turbojet fighter to see action in World War II. "Had the war continued," he commented, "the ME-262 might have turned the tide of battle." Messerschmitt was very reluctant to talk about present plans of the German aircraft industry but revealed he has been "developing airplanes for Spain." He said the ME-262, first flown with a conventional engine in 1939, made its first jet flight in 1941. By June 1942, it was ready for mass production, he said, but the firm was unable to sell the government on the idea for almost a year. The German jet fighter reached a top speed of 640 mph. in horizontal flight at sea level in 1945, he said. Weight was 13,000 lb. fully loaded. Messerschmitt was in Los Angeles as a guest of Victor Pastushin.

UAW-CIO picket lines around the North American plant at Inglewood, Calif., have been among the most orderly ever seen in the state. Even company officials admit this.

Fletcher Aviation Corp. is driving a Cadillac equipped with a Continental E-225 aircraft engine. Purpose is to test a proposed helicopter cooling installation.

Aerolab Development Corp. of Pasadena, Calif., has a windtunnel for sale "off the shelf." Originally built for a company which is not yet ready for it, the tunnel has a 38x54-in. test section with a 175-mph. velocity. This is the third time the Aerolab firm has found itself in the unusual position of offering a ready-made windtunnel for sale because of completion far ahead of scheduled delivery date.

Despite their so-called "gentlemen's agreement," the feud between North American and Northrop for engineering talent broke into the open when Northrop engineers received the following telegram: "New long-range projects have created many new job opportunities at North American Aviation in all technical phases. If you or your friends are interested in investigating the possibilities of our expanded program please contact engineering personnel at Gate 19 on Imperial Highway at your convenience. Open Saturdays."

Ed Heinemann doesn't consider the Douglas F4D a true delta wing.

Test pilots who had been flying the captured MiG-15 on Okinawa were surprised when the news broke out of Tokyo. They had been told classification of the project was "top secret."

Gene Sherman reported in his column in the Los Angeles Times that the British, miffed by the rapidity at which the world's speed record was returned to the U.S., now are trying to develop a sound that is faster than airplanes.

Test pilot George Welch says control system on the F-100 is so effective that it is not even necessary to change the trim when accelerating from subsonic to supersonic flight.

Andrew B. Shea, president of Panagra, says the airline will pass up turboprops. He says the airline will fly the five DC-7s which it has ordered for 1955 until jets are economical, probably about 1959-60.

Lockheed plans to move its T-33 assembly line from Van Nuys, Calif., site of a recent civic uproar when a T-33 crash killed a woman, to Palmdale by next May.

Airport shortage is emphasized by report that Air Force has the money to activate two more reserve wings in Southern California but is unable to find a base for them.

Harold Ross Harris, Jr., son of the president of Northwest Airlines, joined 1,500 other NWA ticket agents during their recent strike and appeared on New York picket lines, the New York Daily News revealed. Wage strike was called off last week and negotiations between union and airline resumed.

AVIATION CALENDAR

Nov. 16—Wings Club, 10th annual dinner, Waldorf-Astoria Hotel, New York.

Nov. 16-17—American Society for Quality Control, conference of the Aircraft Technical Committee, Biltmore Hotel, Dayton, Ohio.

Nov. 17-20—Aviation Distributors and Manufacturers Assn., 11th annual meeting, Jefferson Hotel, St. Louis.

Nov. 19-21—Symposium on Airpower, sponsored by Dallas Council on World Affairs, Baker Hotel, Dallas.

Nov. 19-21—National Aviation Trades Assn. 14th annual convention, Hotel Broadview, Wichita.

Nov. 23-24—Operations Research Society of America, fall national meeting, Statler Hotel, Boston.

Nov. 29-30—Society for Advancement of Management Conference, Hotel Statler, New York.

Nov. 30-Dec. 1—Fifth annual Air Cargo Day, ASME, Hotel Statler, New York.

Nov. 30-Dec. 2—American Society of Mechanical Engineers, annual meeting, Hotel Statler, New York.

Dec. 1-2—ASME's Frequency Response Symposium, Hotel Statler, New York.

Dec. 1-2—Second annual Heavy Press Program, ASME, covering helicopter transmission design features and turbojet components, Hotel Statler, New York. Luncheon honoring engineers' contribution to powered flight by ASME and IAS.

Dec. 7—Civil Aeronautics Board, second session of annual meeting on review of Civil Air Regulations, inter-departmental auditorium, Washington, D. C.

Dec. 17—Seventeenth Wright Brothers Lecture, U. S. Chamber of Commerce building, Washington, D. C. Aero Club Wright memorial dinner, Hotel Statler.

Dec. 17—Royal Aero Club, dinner commemorating 50th anniversary of powered flight, Dorchester Hotel, London.

Jan. 10-12—Institute of Surplus Dealers, trade show and convention, Madison Square Garden, New York.

Jan. 18-22—American Institute of Electrical Engineers, winter meeting, Hotel Statler, New York.

Jan. 20-22—Operations Research in Production and Inventory Control, Case Institute of Technology, Cleveland. Speakers include Paul Stillson of Lockheed Aircraft Military Operations Research Division.

Jan. 25-28—Plant Maintenance & Engineering Show, International Amphitheater, Chicago. Conference will be held concurrently at the Hotel Conrad Hilton.

Mar. 22-25—Institute of Radio Engineers, national convention, Waldorf Astoria Hotel and Kingsbridge Armory, New York.

Apr. 29-30—American Society of Tool Engineers, 10th biennial industrial exposition, Convention Center, Philadelphia.

May 5-7—Third International Aviation Trade Show, sponsored by Aircraft Trade Shows, Inc., 71st Regiment Armory, New York.

May 12-14—Engineering Institute of Canada, annual meeting, Quebec.

May 31-June 11—Canadian International Trade Fair, to be held in conjunction with the National Air Show at Toronto. Canada's Aviation Day will be marked on the final day of the trade show.

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EDITORIAL

Competition for the 'Fast Mail'

"Why give the airlines more mail?" asks a headline in Trains & Travel magazine, over an article decrying the current three-cent airmail trials.

"The public is getting faster service," is one answer. Or do the rails deny that's a virtue?

Officials Break Security Too

Those of us in the press who face difficult decisions almost daily as to what to print and what to exclude in the best security interests of the country can sympathize with Air Force Secretary Talbott's apparent uncertainty in Madrid.

British and American press association wires, as well as special correspondents, said he told a news conference that the United States planned to store atomic weapons in Spain eventually. Later, Mr. Talbott denied he said it.

The most revealing statement of several that were released immediately afterward in Washington was that of Secretary of State Dulles—"If and when we have plans for storing atomic weapons, we shall not announce them publicly to the world and to our potential enemy."

We have a right to feel that the Secretary for Air should know security.

But men even of Cabinet level, and high military officers, fumble on the subject from time to time, with the rest of us, and the record shows they have committed security breaks that were whoppers—some more serious than anything the press has ever committed.

The problem of what information can be disseminated safely will always be with us. Too often in the past, government people have tried to maintain the attitude that security breaks mainly were offenses by industry or press. We contend, respectfully, that this is not by any means always the case. Madrid, for example?

'We Saw It Happen'

United Aircraft Corp. has produced a feature-length motion picture "depicting the men, the times and the events in the fifty years of powered flight." Previews have been shown in New York, Washington, Hartford and Dallas, and the film is being edited for further exhibition.

Any such enterprise is difficult, and the producers here were confronted with acute problems of judgment in deciding what to include, cut and edit, and how to proportion the elements to convey the most authentic, interesting and comprehensive story.

Despite these problems, and with the knowledge that no such ambitious product can please everyone, we feel that United Aircraft has performed a valuable service to aviation, especially in dispatching its camera crews all over the country to interview some of the oldest living pioneers in aeronautics.

These men, of high and low station in life, tell the stories of the parts they played in aviation history with an ease and naturalness that is seldom seen in the movies these days. These simple interviews of the old timers are not only absorbing stuff for those of us in aviation, they are a valuable and lasting contribution to aviation history.

Fewer Free Rides

An indignant reader takes AVIATION WEEK to task for recent publication of a letter from a Civil Aeronautics Administration agent. The letter, accompanied by a facsimile of a government transportation form, contended that CAA agents abuse these tickets, which they sign themselves to obtain free transportation on the airlines, ostensibly to carry out their CAA duties. No check was ever made by CAA on the need for such travel, it was claimed.

The reader castigates us for: (1) Publishing an "unsigned" letter; (2) permitting such an accusation to be publicized; (3) not investigating the veracity of the writer's statements.

We have told the reader that: (1) The writer signed his name to the letter but that we omitted it for his personal protection; (2) we knew the writer, and his past reports had proved accurate; (3) the accusation was investigated and the agent's contentions were borne out by other CAA personnel.

We also told the critic that a few days after AVIATION WEEK appeared with the letter, a spokesman for CAA telephoned to thank us for publicizing the matter. He reported that all of the forms were being called in to regional offices where each ticket will be numbered before re-issue. "Any numbered copy thrown away would be missed by the region and supervisor," CAA says.

Let's Outlaw Confusion

In an effort to ease public confusion, the Civil Aeronautics Board has ordered North American Airlines—a nonsked—to discontinue its name. It infringes on American Airlines' rights, the majority held.

For years—until recently—All-American Airways operated under that name, and there was confusion, but CAB never did anything about it—nor the "infringement."

We now await the fireworks that will let go when CAB starts similar action against Pan American. More confusion. More infringement.

And while the Board's easing public confusion, we wish they would see that Seaboard Air Line Railway changes its name immediately! The confusion on this one is terrible, and the railroad's use of the words "air line" infringe on aviation.

—Robert H. Wood

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