AVIATION WEEK
JAN. 26, 1948
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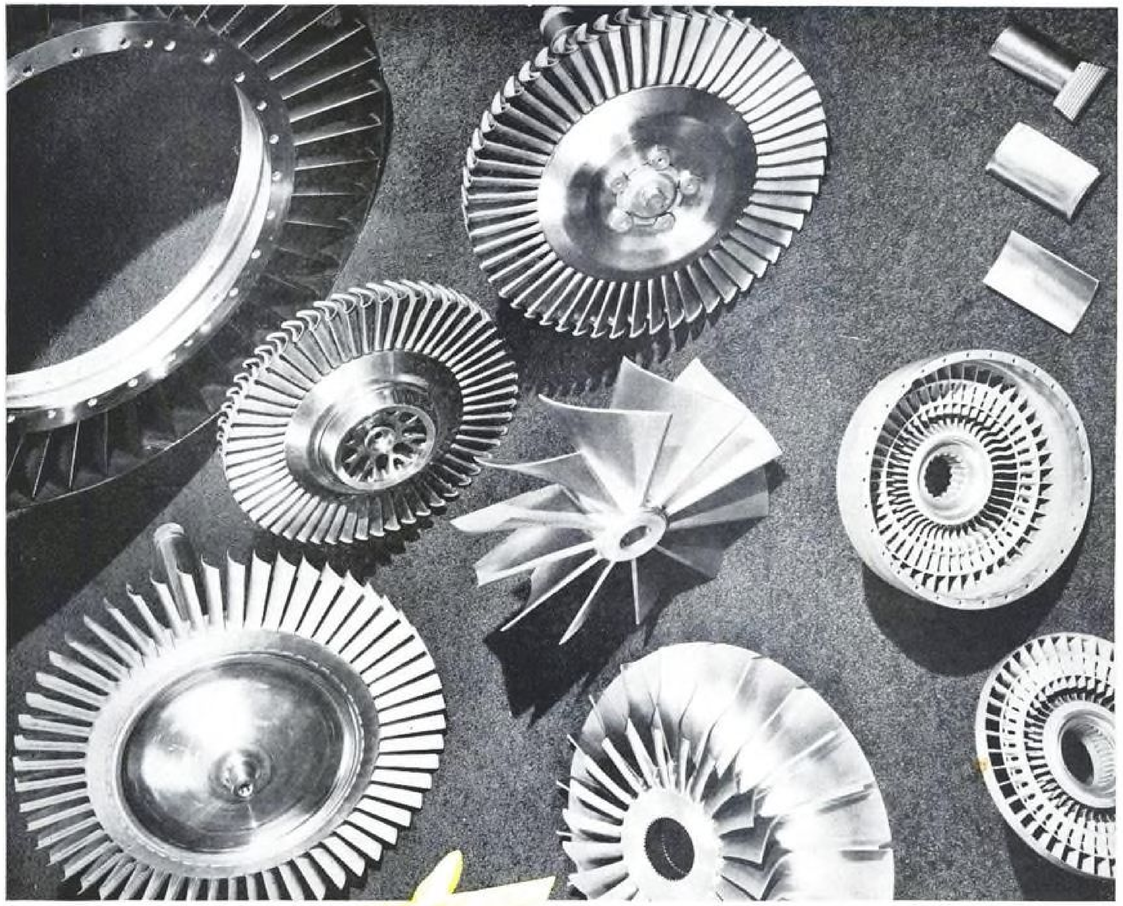

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B.F.Goodrich
FIRST IN RUBBER

AVIATION WEEK

Vol. 48 No. 4 — Jan. 26, 1948

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THE AVIATION WEEK

NEW BOOK—Events in Washington have followed in such rapid succession as to make it apparent that governmental relations with aviation are not just turning a new page; they are likely to constitute a new book.

First was the Landis dismissal, then the Air Policy Commission report. Last week came the submission of resignations by CAB member Harllee Branch and CAA Administrator T. P. Wright. The Air Policy Commission's proposals for a revamping of the governmental aviation establishment as yet are merely that, with no indication of immediate steps to implement them.

But the CAB membership changes are already a tangible factor and so, too, is the resignation of Wright. Although Wright's plea to quit was not immediately accepted by the President, few believe he could be persuaded to remain at his post for long.

Even the two things taken together—the CAB vacancies and Wright's imminent departure—could mean a sharp change in the direction of policies and procedures. Acceptance by the President of the Policy Commission's recommendation for a Department of Civil Aviation would make such a change in direction almost certain.

MARKING TIME—Meanwhile, action taken now on policy matters up before CAB and CAA will seem a little hollow. With Clarence Young's place on the Board still unfilled, CAB is a three-man body. Even with five men, CAB fell behind in its work. There is no reason for observers to believe that the present three members can move faster than the full Board was able to do.

There also could be an understandable reluctance on the part of Ryan, Lee and Branch to attempt to sweep away before the advent of the three new members the knottiest problems that so long have been before the Board.

After the President succeeds in filling the spots of Young, Landis and Branch, the Board perhaps would have a new voting majority.

The situation on the CAA side is somewhat similar. Wright, while acknowledged as a sound and progressive thinker, has not been able to keep tabs on the whole sprawling CAA organization. While he "streamlined" it, it still covers such a wide field that major policy decisions sometimes must be made on lower levels by men who have not always been aware of, or sympathetic to the Administrator's thinking. Many of these men cued from Charles I. Stanton, deputy administrator, who also now has bowed out of CAA, at least temporarily.

Result is an area for change in CAA policy and administration as wide as that on CAB.

TALLY SHEET—A quick glance at only a few of the pending matters in CAB and CAA indicates the effect on practically all phases of the industry of any broad changes of view that might occur within either agency.

Both economic and safety matters of vital concern to air transport were before CAB when its membership began disintegrating. The jockeying for position and power between the scheduled, certificated lines and the non-certificated operators has by no means reached the final round.

Either an off-shoot or an integral part of this (depending on viewpoint) is the cargo situation.

The Board was still involved in a mental wrestling with the safety recommendations of the special Presidential inquiry when Landis, chairman of the safety group and most interested in pushing its proposals, was passed over.

This leaves the remaining three to grapple with such explosive issues as temperature accountability, fire prevention and minimum runway lengths.

Just when the Board probably thought it had disposed of the surface carrier matter largely by ignoring it, it was thrown back by the Air Policy Commission.

CAA'S PROBLEMS—CAB shares with CAA another walloping headache that affects manufacturers as well as air carriers. This is the continued tinkering with Part 04 of the Civil Air Regulations which establishes airworthiness standards for transport planes.

No one seems happy about Part 04b, the supposedly effective version. Much of 04b represents CAA thinking, so top-level changes in that agency might hurry a re-draft.

CAA has its exclusive problems: navigation and landing aids, the lagging airport program with its regulations that have been written twice, amended and are now being amended again; lightplane airworthiness regulations; safety inspection; and enforcement of private flying regulations.

Despite recurrent criticism, generally by indirection, of Wright's administration, changes for the better that have been made in CAA have come about through his actions. But his successor will still find a basket-full of worries.

OVERHAULING POSSIBLE—There is to be reckoned with the possibility of a thorough-going overhauling along the lines suggested by the Air Policy Commission.

Wright perhaps could be persuaded to stay on a few months longer while plans were jelling. CAB could be left to struggle along as a three-man Board while legislation was prepared to create the Civil Aviation Department.

There are no odds yet on whether the President will move fast on the Policy Commission's recommendation or, if he does, what the congressional reception is likely to be. If it looked like a controversial issue, likely to demand extended consideration and debate, chances of passage would be slim. Congressmen want to go home and start politicking early this year.

NEWS DIGEST

DOMESTIC

Month-long negotiations between TWA and the Airline Navigators Association broke down last week and union spokesmen said a strike of navigators on international flights was "probable."

Air Force has consolidated Air Proving Ground Command with the Air Materiel Command in the interests of economy. Formerly an independent command, APGC tests the tactical proficiency of new aircraft and weapons. Renamed the Air Materiel Proving Ground, the facilities at Elgin Air Force Base, Fla., will continue to handle its present function.

An overseas air parcel post service is now being organized under the direction of Postmaster General Jess M. Donaldson. The service will begin as soon as international agreements necessary for the service are ratified.

FINANCIAL

Beech Aircraft Corp. reports net income after taxes of $319,858, equivalent to 80 cents a share on 400,000 shares outstanding for the quarter ending Dec. 31. This compares with a loss of $116,851 for the same period last year.

Airline insurance companies estimate a gross loss of $5-9,000,000 for 1947 through heavy payments for aircraft accidents. Crashes cost the companies more than $4,600,000, flight losses in which no lives were lost another $5,000,000 and legal liability payments for passenger fatalities cost more than $5,000,000.

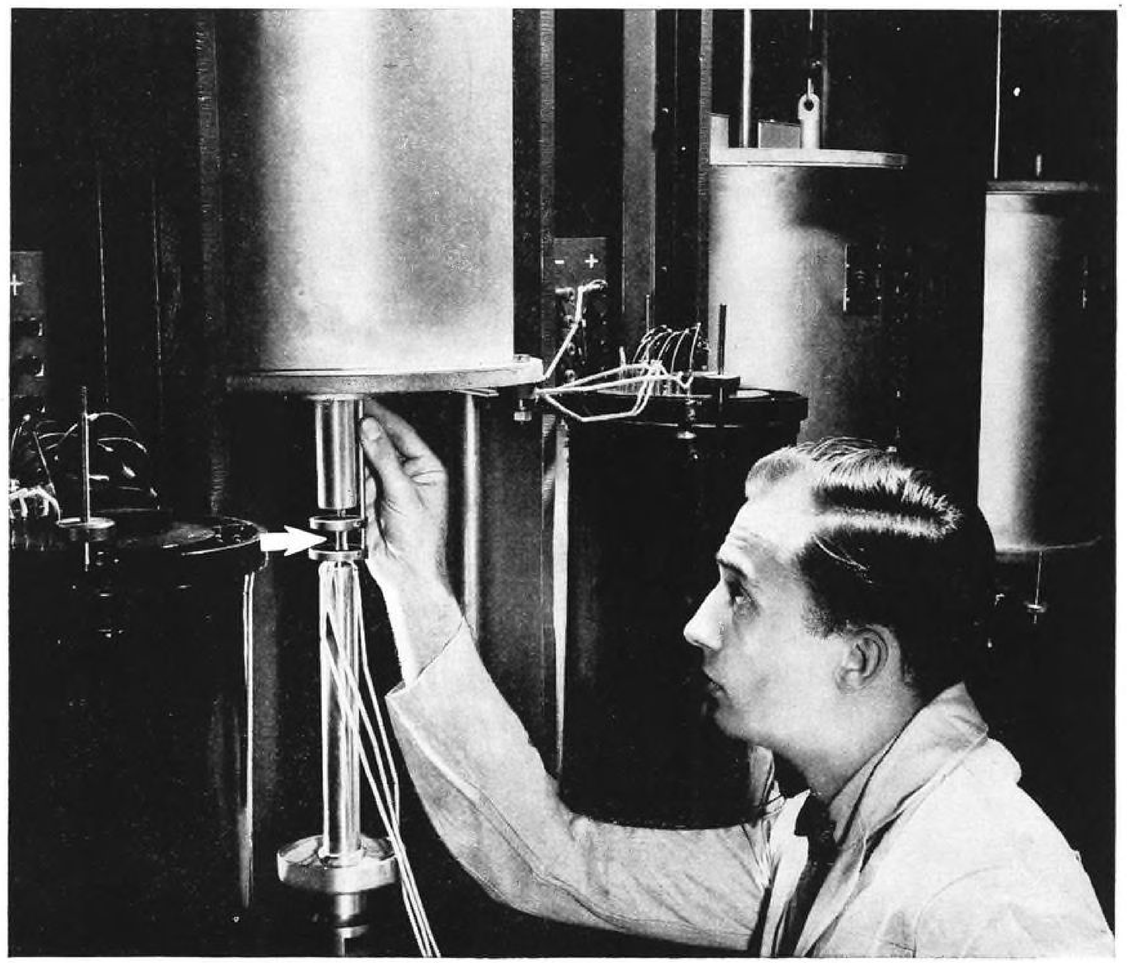
DeHavilland Aircraft of Canada, Ltd., reports net loss of $616,104 in Canadian currency for the year ended Sept. 30 compared with a net income of $143,347 for the previous fiscal year.

FOREIGN

BOAC has announced plans to move its Constellation maintenance base from Dorval Airport, Montreal, to Filton Aerodrome, Bristol, England. The action is being taken largely to save dollar expenditures.

United Kingdom and the Philippine Republic have concluded a civil aviation agreement in Manila. The pact covers services from the Philippines to England and Australia and from Manila to Hong Kong.

Palestine government has given official approval for establishment of an Arab and a Jewish airline. The Arab carrier, Eastern Airways, Ltd., will operate to Arab countries, while the Jewish company, Palestine Airways, Ltd., will fly to European capitals.



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T. P. Wright to Leave CAA Post For Cornell Air Research Group

Administrator will direct air laboratory and research foundation; Lee and Anderson are considered likely candidates for appointment to post.

Resignation of Theodore Paul Wright as Administrator of Civil Aeronautics lay on President Truman's desk last week, still unaccepted. It was understood Wright will remain in his post for several weeks to complete some current duties, before going to his new job as director of the Research Foundation of Cornell University, Ithaca, N. Y., including the Buffalo, N. Y., Aeronautical Research Laboratory.

Frederick B. Lee, deputy administrator of CAA, and former executive assistant to Wright, appeared the most likely choice within CAA to succeed Wright. Secretary of Commerce Averill Harriman has a preference for non-political aviation appointments. Lee has a long record as a New York attorney, private pilot, and as a Naval Aviation Administrator before coming to CAA.

Name of William A. Anderson, Pennsylvania state aeronautics director, and former president of the National Association of State Aviation Officials, was being mentioned in the aviation industry as another capable prospect for the CAA top post. Anderson is a member of the CAA's non-scheduled Flying Advisory Committee, and has made outstanding administrator's record in his own state for flying safety, air marking, airport construction, and other phases of aviation development work.

▶ **Triple Salary**—Wright's new Cornell job carries a salary approximately three times that of his CAA $10,000 annual stipend.

He has told friends that he felt he could no longer afford to remain in government because of the expenses connected with his job not covered by his salary. Wright has been continuously in Washington administrative posts since 1941, when he was named assistant chief, aircraft section Office Production Management. He was later named assistant chief, aircraft section, War Production Board, and still later became director of Aircraft Resources Control Office, WPB. In the fall of 1944 he was appointed to his present post.

T. P. WRIGHT

Before coming to Washington, he had a 20 year career in aircraft engineering and executive posts, first with the Curtiss Aeroplane and Motor Co., and later with its successor, Curtiss-Wright Corp., serving as vice-president of the latter company at the time he entered government service. As an engineer he is probably best known for his work in development of the Curtiss Tanager, a plane which won the $100,000 Guggenheim Foundation first prize in a 1929 competition. He also aided in development of many other military and civil aircraft.

▶ **Wright Policies**—Taking over CAA in the critical period of converting civil aviation to a postwar level, Wright set up liberal policies of regulation which were frequently ignored or short-circuited by some of his more reactionary "Old Guard" CAA subordinates. Despite this handicap, Wright can be credited however with liberalizing physical requirements for pilots, setting up an advisory committee on non-scheduled flying, appointing large numbers of flight examiners and factory inspectors from industry to take over the main burden of inspection duties from the CAA general inspectors, and other actions to promote personal aviation.

He sought to stimulate development of better personal planes, through CAA development contracts, but this proposal met with a chilly industry reception.

Wright also became involved in the stormy controversy between radar GCA and the VHF radio ILS, which found CAA technical men as sponsors of CAA-developed Instrument Landing System on the opposite side of the fence from a large segment of the aviation industry and congressional aviation leaders who preferred the World War II-developed Ground Control Approach radar system. Controversy thus far has resulted in double installations of ILS and GCA at many airports and congressional disapproval of further ILS funds.

Other factors besides the small CAA administrator's salary undoubtedly entered into Wright's decision to resign. Among these might be cited: a somewhat "fed-up" attitude about criticisms of CAA red tape and bureaucratic short comings, rarely aimed at the administrator, but rather at his "Old Guard" subordinates; an inclination to chafe under the civil aviation setup which leaves the administrator subordinate to two Commerce officials, the Secretary and the Assistant Secretary of Commerce for Air.

Whether Wright's departure may have any bearing on acceptance of the President's Air Policy Commission's recommendations for sweeping revision of the status of civil aviation agencies in federal government will be watched closely by observers.

▶ **Civil Air Department**—The Finletter commission recommended establishment of a Department of Civil Aviation under the Department of Commerce, with a Secretary of Civil Aviation, on the same administrative level as Secretaries of Air Force, Army and Navy. It called for establishment of independent Civil Aeronautics Board and Air Safety Board, to separate the handling of safety and economic regulations. Under the Department of Civil Aviation would be

set up four bureaus: federal airways, airports, safety regulation, and facilities planning. An Aircraft Development Corporation would be set up with a board of directors headed by the Secretary of Civil Aviation as chairman with the Secretary of the Air Force as a member, to finance development and purchase of civil aircraft and components.

Navy Has Two New Plane Types for '49

Bureau of Aeronautics procurement plans for 1949 remain tentative pending final appropriation determinations during the current Congress. Navy has already obligated funds provided for the purpose for continuation in production of the majority of aircraft slated for delivery during this year. Two new types, Vought F6U and Martin P4M, will go into production initially during 1949. Already committed to Bureau of Aeronautics procurement throughout next year are:

▶ **Fighters**—Thirty Chance Vought F6U-1 Pirate jet fighters, featuring smooth Metalite exterior structure and a Westinghouse 24C axial-flow turbojet engine; final 65 Grumman F8F-1 Bearcat propeller-driven fighters; final 89 Grumman F9F-2 Panther fighters and final 49 McDonnell F2H-1 Banshee twin-jet fighters are slated for completion during 1949. Definitely in the running for an expanded order carrying through 1950 is the Grumman Panther, which has rapidly become a high priority Navy production and development project.

▶ **Attack Plane**—Continuing well into 1949 production is the Douglas AD-1 Skyraider. Production of 123 during that year will complete a total quantity of 539 airplanes. This hard-hitting offensive weapon will comprise the Navy's carrier attack arm for the next several years in line with its tactical doctrine that once fast jet fighters have gained air control, propeller-driven attack planes are adequate and far more efficient for the clean-up job than jet attack planes might be.

▶ **Patrol Planes**—Last 30 Lockheed P2V Neptune patrol planes will be completed during 1949 as well as a small preliminary service test order for Martin P4M-1 Mercator combination jet and reciprocating engined patrol craft. Now being negotiated is an additional contract bringing the total order for this high-performance long-range search plane to 24, funds for which are already available. Next year will see completion of the current Martin PBM-5A amphibian contract with delivery of 12 planes, completing the 47 that are presently on order.

Lobby Probe Hits Airlines

With preliminaries on the investigation into alleged airline lobbies as well as other lobbying investigations under way by the Department of Justice nearing completion, Attorney General Tom Clark last week authorized his special assistant, Irving Kaufman, to follow through by summoning a grand jury.

According to Pan American Airways' vice president Sam Pryor, Justice approached PAA on the investigation with a letter stating that scrutinies were being made to determine possible lobbying by airlines. Justice Dept. completed an examination of PAA books. As yet no evidence has come to light on Justice Department scrutiny of any other carrier.

▶ **Seek Violations**—Justice's lobbying investigations are being made to unearth possible violations of the 1946 Congressional Reorganization Act requiring registration of lobbyists with the House clerk. A maximum penalty of $5,000 or imprisonment for one year, or both, is laid down for failure to register. No individual connected with Pan Am has registered as a lobbyist.

Howard Hughes made the charge last August, on the eve of a Senate investigation into his wartime plane manufacturing contracts, that Sen. Brewster (R., Me.) had used his political position to further the interests of Juan Trippe and PAA. When requested by Kaufman to present testimony, Hughes said that Noah Dietrich, TWA vice president, would be better qualified.

It is understood that Hughes prefers to present his evidence to the Justice Dept. on the West Coast where his activities on his giant flying boat and electronics research have kept him too busy to make another trip to Washington "convenient."

If Hughes presents his formal complaint to the Justice Dept. the Brewster matter will not be dropped without further explanation. Indication that Hughes may press the charge came in the Washington appearance of Dietrich, early in January, as a witness in the case. Dietrich presented secret testimony to the Justice Dept.

In a letter to Brewster on Oct. 21, Kaufman stated "if you . . . will advise us by letter that it is your desire to withdraw your request for an exploration by the Justice Department [of Hughes charge] . . . the exploration requested by you will not be undertaken." Brewster subsequently denied that he had requested the "exploration," but had stated only that if a complaint making the charge were filed by Hughes he "would welcome and invite exploration."

"You will observe that in the published statement of Mr. Hughes he states that he proposed to present his complaint to you as attorney general for investigation," Brewster wrote. "You will note that in my public statement I stated that I would 'welcome and invite exploration' of his charge by you." It was as a follow-up to this declaration that Justice invited Hughes to file a complaint.

Justice's investigation of PAA lobbying is taken in some quarters as a countermove to the Republican move in the Senate to investigate the Justice Department for an alleged "whitewash" of frauds claimed in last year's Democratic primary in Kansas City. The frauds involved Enos Axtell, President Truman's choice to replace incumbent Democratic Congressman Roger Slaughter. Justice investigation was demanded last year by Republican members of a judiciary subcommittee, headed by Sen. Homer Ferguson (R., Mich.). Filibustering Democrats blocked authorization for the investigation during the closing days of the last session. Republicans placed the authorization as the top order of business for the new session. During the first two weeks of this session, however, no action has been taken. Ferguson was chairman of the war investigating subcommittee which heard Hughes' charges against Brewster last August. He was appointed to the post by Brewster, chairman of the full War Investigating Committee.

Loran Bill

Legislation authorizing the Coast Guard to establish and operate air safety facilities, both within the United States and overseas, for the Air Force and Naval Aviation has been introduced recently in the legislative chamber, by Sen. Wallace White (R., Me.), chairman of the Senate Interstate and Foreign Commerce Committee.

IAS Honors Night Features Meeting

Honors Night Dinner of the Institute of the Aeronautical Sciences at New York City's Hotel Astor, Jan. 26, climaxes the first sessions of the four-day annual IAS meeting. Featured with the presentation of annual awards will be a speech by Thomas K. Finletter, chairman of the President's Air Policy Committee.

During the meeting, John K. Northrop will be inducted as the new Institute president.

Top event of the first evening will be the presentation of the Sylvanus Albert Reed Award "for notable contribution to the aeronautical sciences resulting from experimental or theoretical investigations, the beneficial influence of which, on the development of practical aeronautics, is apparent." Recipients are two Bureau of Standards aerodynamicists, Dr. Galen B. Schubauer, and Dr. Harold K. Skramstad, "for important contributions they have made to the art of measuring turbulence, and the study of boundary layer flow."

Highest pilot honor, the Octave Chanute Award, will be given to Lawrence A. Clousing, head, flight section, Ames Aeronautical Laboratory, National Advisory Committee for Aeronautics, for "research on various airplanes at very high speeds, enabling measurement of compressibility effects on stability, control and structural loads at very high Mach numbers."

In the field of aviation medicine, the John Jeffries Award goes to a Canadian, Dr. J. Winfred Tice, cited for "outstanding contributions to the advancement of aeronautics through medical research."

Col. Benjamin G. Holzman, ranking meteorologist on the staff of the U. S. Air Force of Research and Development, will be the 1947 recipient of the Robert M. Losey Award. Holzman's citation states, "In recognition of outstanding contributions to the science of meteorology as applied to aeronautics."

The Lawrence Sperry Award will be presented to Commander Noel Arthur Meredyth Gaylor, USN, executive director, Special Devices Center, Port Washington, N. Y. Commander Gaylor was cited for "outstanding contributions to synthetic training methods and devices in the field of aviation."

James H. Doolittle, vice president and a director of Shell Union Oil Corp., a past-president and fellow of the Institute of Aeronautical Sciences, will become an Honorary Fellow of the Institute—the highest honor of IAS.

Branch Leaves CAB; Kuter Out

Board reduced to two members by Harllee Branch resignation effective May 1.

The search for likely $10,000-a-year candidates for the Civil Aeronautics Board grew hotter last week as President Truman accepted Member Harllee Branch's resignation and a Senate committee for the second time refused to approve a special dispensation permitting Maj. Gen. Laurence S. Kuter to become board chairman.

Branch, whose resignation becomes effective May 1, told President Truman he wanted to leave the board because he was "quite tired." The 68-year-old CAB member added that the high cost of living in Washington makes it necessary for him to improve his personal situation.

▶ **Two Members Left**—Appointed to CAB in August, 1938, as one of the board's original members, Branch was vice chairman from then until July, 1940, and chairman from July, 1940, until Dec. 31, 1941. His present term expires Dec. 31, 1950. Branch's resignation left only two members who are planning to stay on with CAB—Vice Chairman Oswald Ryan and Member Josh Lee.

Meanwhile, the Senate Armed Services Committee again balked at President Truman's request that General Kuter be permitted to retain his Air Force rank and $15,500 annual pay while serving as CAB chairman. In standing pat on its original action (AVIATION WEEK, Jan. 19), the committee turned down a personal plea from the President.

The committee also rejected a compromise proposal backed by four Democrats. This plan would have permitted Kuter to serve one year (instead of the six-year term) with his military rank and salary.

▶ **Six Refused**—President Truman, in asking the committee to reconsider its stand, stated that he had offered the CAB chairmanship to more than six qualified men, but all had refused the post. The President observed it was extremely difficult now to get a good man for the chairmanship who is not involved in some way with commercial aviation.

Following the Armed Services Committee's second rejection of special legislation covering the proposed Kuter appointment, President Truman said he had abandoned hope of putting the General into the CAB chairmanship.

Lewis Feted

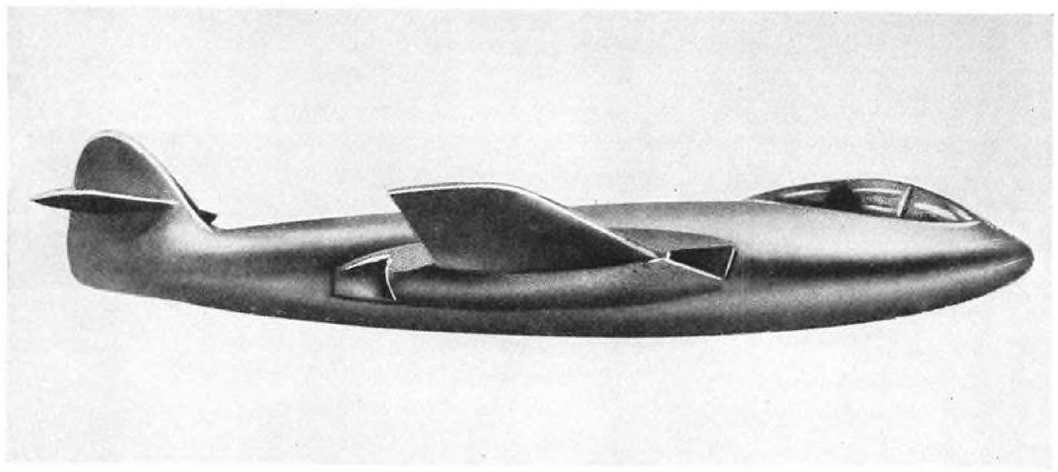
Dr. George W. Lewis, for 28 years NACA Director of Aeronautical Research and now NACA research consultant, has been honored by a testimonial signed by the 15 members of the Committee in tribute to his exceptionally meritorious service to his country. Joining the NACA in 1919 when it had one small wind tunnel and 43 employes, Dr. Lewis pioneered in the design and construction of special research equipment and was the first to use variable density, full-scale refrigerated, free-flight gust and high speed wind tunnels. He developed the three NACA research laboratories and coordinated a research staff that presently numbers about six thousand employes. Under his leadership the NACA has made scientific and technical contributions of inestimable value to the national security and to aeronautical science the world over.

U. S. Transport Groups Shape ICAO Policy

The U. S. position with respect to recommending changes in ICAO proposed airworthiness requirements was being formulated last week at a national conference of interested agencies in Santa Monica, Calif.

More than 50 key representatives of Aircraft Industries Assn., Air Transport Assn., Air Line Pilots Assn., and Civil Aeronautics Administration were in attendance under chairmanship of Ray B. Maloy, CAA flight engineering division chief. Discussions were in closed session during three days of conference with the probability that announcement of recommendations will be made prior to ICAO's decisive meeting in Montreal in September.

Reflecting British interest along a similar line, the Santa Monica conference concentrated on shaping proposals for ICAO that will anticipate the advent of turbine powered transports. Feeling of U. S. aircraft leaders seems to be that airworthiness requirements that will be set up for today's piston engine transports should be given such flexibility that they can be modified to cover turbine engine aircraft. ICAO may be asked to establish dual requirements for today's transports and the turbine transports of tomorrow, with particular reference to floors and ceilings of climb requirements and temperature accountability.



LATEST BRITISH JET FIGHTER

Hawker N.7/46, newest British jet fighter, made its first test flight recently and now has about three hours in the air. Shown above is an artist's sketch. This latest Hawker is powered by a Rolls Royce Nene with twin intakes and tail-pipes.

Nimitz Plugs Atom Bomb Carrier Planes

Atomic bomb-laden Navy carrier planes will spearhead attacks in the next war is the opinion of Fleet Admiral Chester W. Nimitz, retiring chief of naval operations. In a valedictory study of the future employment of naval forces, Nimitz thoroughly embraces air power as the basic future strength of the U. S. Navy, a combination of carrierborne aircraft and ship-launched missiles. Among other representations, he holds that:

"Aircraft carriers constitute the only air bases that can be made available near enemy territory without assault and conquest; they are mobile offensive bases that can be employed with the unique attributes of secrecy and surprise.

"The earliest warning of enemy air attack against our vital centers should be provided by naval air, surface and submarine radar pickets deployed in the vast ocean spaces which surround the continent.

"Protection of our cities against missile launching submarines can best be effected by naval hunter-killer groups composed of small aircraft carriers and modern destroyers operating as a team with naval land-based aircraft.

"It is improbable that bomber fleets will be capable, for several years to come, of making two-way trips between continents, even over the polar routes, with heavy loads of bombs. It is apparent then that in the event of war within this period, if we are to project our power against the vital areas of any enemy across the ocean before beachheads on enemy territory are captured, it must be by air-sea power; by aircraft launched from carriers and by heavy surface ships and submarines projecting guided missiles and rockets. If present promise is developed by research, test and production, these types of air-sea power operating in concert will be able within the next ten years critically to damage enemy vital areas many hundreds of miles inland."

Johnson Bill Seeks Funds To Implement Air Policy

Legislation indorsing the Air Policy Commission's recommendation for a 1948 calendar year Air Force budget of $4,150,000,000 and a 1949 budget of $5,450,000,000 was introduced last week by Sen. Ed Johnson (D., Colo.), an isolationist-inclined advocate of strong U. S. defense forces and a dissenter on foreign reconstruction spending as a means for securing peace for the United States.

The measure authorizes an "extra" appropriation for the national defense ("in addition to such sums as may otherwise be appropriated") of $2,000,000,000 for the 1949 fiscal year and again for the 1950 fiscal year, to carry out the recommendations of the Commission and "regain and maintain the supremacy of the U. S. in air power." Since the bill does not even authorize the $4 to $5 billion annual Air Force budget proposed by the Commission—let alone appropriate it, it is generally regarded as little more than fanfare to focus attention on the need for a strong air defense.

Ebel Leaves Martin For Curtiss-Wright

William K. Ebel, for 25 years an engineer with the Glenn L. Martin Co., most recently as vice president in charge of engineering, has resigned and accepted the post of Director of Engineering for the Airplane Division of the Curtiss-Wright Corp. Ebel combines the duties of designer and test pilot, having made the initial test flights in the Martin BM-1 dive bomber, the Martin B-26 Marauder bomber and the Martin XPB2M-1 "Mars" flying boat. Curtiss-Wright is presently engaged in flying missile and pilotless aircraft development work, in addition to regular research and production activities.

Succeeding Ebel as Martin engineering vice president is D. Roy Shoults, named chief engineer last June. Shoults was formerly engineering vice president of Bell Aircraft Corp. and an engineer for the General Electric Co. for a period of 20 years.

UAL-Pilot Pact

United Air Lines and the Air Line Pilots Association have reached an understanding on the disputed grievance machinery section of their new contract. The issue previously had provoked a strike ballot and walkout threat by the pilots. Signing of the new contract was believed imminent last week.

Waterman Probe Dropped

CAB's enforcement and litigation section has suggested that the Board dismiss Chicago & Southern Air Lines' complaint of Aug. 19, 1946, which asked for an investigation to determine whether Waterman Airlines (wholly-owned subsidiary of Waterman Steamship Corp.) was operating in violation of the nonscheduled exemption. The enforcement section noted that CAB on Jan. 14, 1948, accepted the surrender of Waterman's letter of registration as a nonscheduled carrier, adding that the operations complained against have been discontinued.

AVIATION CALENDAR

Jan. 7-30—Air Transportation Institute, American University, Washington, D. C.
Jan. 26—AIA aircraft technical committee, AIA office, Los Angeles.
Jan. 26-28—CAA non-scheduled operators of region four, Fort Worth.
Jan. 26-29—16th annual meeting, Institute of the Aeronautical Sciences, Hotel Astor, New York.
Jan. 26-30—American Institute of Electrical Engineers, Pittsburgh.
Jan. 27—American Road Builders Association, airport division, Washington, D. C.
Jan. 28—AIA patent committee, Manufacturers Aircraft Association office, 30 Rockefeller Plaza, New York.
Jan. 28—AIA Personal Aircraft Council, Hotel Statler, Washington.
Jan. 29—AIA Aircraft Manufacturers Council, eastern regional executive committee, Wings Club, New York.
Feb. 5—American Legion national aeronautical conference, Wright Field.
Feb. 6-7—American Legion national aeronautical conference, Indianapolis.
Feb. 13—Air Transport Command reunion, Waldorf Astoria, New York.
Feb. 16-17—Second annual Purdue Airport and Fixed Base Conference, Purdue University, West Lafayette, Ind.
Feb. 17-19—ATA meteorological committee, Peabody Hotel, Memphis.
Feb. 26-27—Louisiana Aviation Conference, Shreveport.
Mar. 8.—ICAO maps and charts division, Brussels.
Mar. 22—ICAO areonautical maps and charts division, Brusse's.
Mar. 26—National Flight Propulsion meeting, Institute of the Aeronautical Sciences, Hotel Carter, C'evelard.
Mar. 30—ICAO personnel licensing division, Montreal.
Apr. 1-3—American Institute of Electrical Engineers, Des Moines.
Apr. 4-8—American Association of Airport Executives, Congress Hotel, Chicago.
Apr. 20—ICAO rules of the air and air traffic control division, Montreal.
Apr. 27—ICAO facilitation division, Europe.
Apr. 28-30—American Institute of Electrical Engineers, northeastern district meeting, New Haven, Conn.
June—Second ICAO assembly meeting, western Europe.
June 1—ICAO second assembly, Palais Des National, Geneva, Switzer'and.
June 21-25—American Institute of Electrical Engineers, summer general meeting, Mexico City.
July—International Air Exposition, Idlewi'd Airport, New York.
July 15—Ninth annual meeting, Airline Advisory Board, Kansas City, Mo.
July 31—International Air Exposition, Idlewild Airport, New York.
Aug. 24-27—American Institute of Electrical Engineers, Pacific general meeting, Spokane, Wash.
Sept. 2—International Aeronautic Federation, Cleveland.
Sept. 3—International Aeronautic Federation, Cleveland.
Sept. 4-6—National Air Races, Cleveland.
Sept. 8—ICAO operations division, Montreal.
Sept. 21—ICAO airworthiness division, Montreal.
Oct. 5-7—American Institute of Electrical Engineers, middle eastern district meeting, Washington.

INDUSTRY OBSERVER

► **New flying boat development is waiting for perfection of turboprop engines, according to C. H. (Dutch) Schildhauer, former NATS commander and Panam executive. With turboprops it will be possible to build a 260,000 lb. flying boat that can carry a 55 percent useful load—about 10 percent better than any landplane. This giant boat will cruise at 300 mph. at 30,000 ft. and carry a 40,000 lb. payload for 5,000 mi.**

► General Carl A. Spaatz has set Jan. 1, 1949, as the earliest possible deadline for the Air Force to reach a strength of 70 groups, provided funds are available. He also discussed Russian aircraft production in great detail both qualitatively and quantitatively during executive sessions of the President's Air Policy Commission.

► **Piper Aircraft Corp. is scheduled to resume production around Feb. 1. Price on its new four-placer will be between $4,000 and $4,500.**

► Edo has completed its production order for 10 XOSE-1s for the Navy. Most of the planes have been delivered to Patuxent.

► **Douglas Aircraft Co. has completed seven C-74s for the Air Force but deliveries have been delayed by changes on the Pratt & Whitney R-4360-49 engines involving a boost of power from 3,000 hp. to 3,500 hp. Five C-74s will go to Air Transport Command and two to Air Materiel Command.**

► Work is well under way on the Saro SR45 giant flying boats at Cowes, England. They will be powered by 10 Proteus turboprops.

► **Boeing President William M. Allen estimates that seven years may be required for complete development of Boeing's sweptwing, six engined jet bomber.**

► Lockheed's second Constitution may not fly for several months. While construction is progressing, and the airplane structurally is complete, it still must receive engines and other accessory components. The No. 1 Constitution, still under factory test but nearing the time when it will be turned over to Navy for service testing, returned to the air Jan. 9 with a takeoff run of no more than 1800 ft. although loaded to 165,000 of its 184,000 lb. designed gross weight.

► **Curtiss-Wright test pilot Lee Miller will fly the four jet XP-87. experimental all-weather fighter, on its initial flight tests. Assembly of the XP-87 has been completed at Muroc and ground tests have begun by Air Force personnel preparatory to Miller's first flight.**

► Navy GCA unit at Seattle registered its 10th emergency save last week, guiding nonscheduled commercial airliners to landings in below CAA minimum weather when all other available alternates were closed by weather. Trans-Alaska DC-3 was landed with 300 ft. ceiling and 2 miles visibility and a Totem Airlines PBY-5A landed with 200 ft. and 1 mile. Both carried passengers from Alaska including two emergency hospital cases.

► **Both Navy and Air Force plan to continue aircraft "de-mothing" operations until 1950 at which time it is estimated that present aircraft storage stocks will be exhausted.**

► Secretary Symington of the Air Force believes at least six to eight aircraft companies with adequate engineering departments are necessary for Air Force procurement. Symington's revision of Air Force procurement policies spearheaded by Undersecretary Arthur Barrows is aimed at establishing negotiated contracts as peacetime procurement procedure and eliminating sealed bid competitive procedures. Air Force is also considering methods by which unsuccessful firms in design competitions can be given subcontracts on successful design production orders.

► **First Australian-built Rolls-Royce Nene turbojet engine is scheduled for completion and test in June. Produced by Commonwealth Aircraft Corp., Melbourne, the engines will power Australian-built De Havilland Vampire jet fighters.**

► Avions Marcel Dassault is building a Dassault 450 which closely resembles the Douglas D-558 in external lines. It is a combat fighter powered by a Rolls-Royce Nene turbojet engine and armed with four 20-mm. cannon. Its top speed is estimated at 578 mph. Dassault is an independent company in the socialized French aircraft industry.

ENGINEERING & PRODUCTION

Long Range Procurement Plans Suggested for Aircraft Industry

Air Policy Commission sees gearing of manufacturers to 70-group Air Force plan, production of essential military aircraft, as answer to financial plights.

Gearing the aircraft manufacturing industry directly into the Air Force 70-group plan, providing for long-range (five year) procurement and integrating mobilization planning into the aircraft production system will, in the opinion of the President's Air Policy Commission, provide a sound aircraft industry structure on which to base our national defense.

If the aircraft manufacturing industry can be permitted to produce that quantity of military aircraft (30-40 million airframe pounds annually) deemed essential to support the national security, its financial problems ($85 million loss in 1946, $80 million loss in 1947) will be solved and the minimum production level required for rapid expansion in an emergency will be maintained, the Commission believes.

▶ **Planning Problem**—The Commission feels strongly that the major problem of the industry since the war (as well as in pre-war years) has been a lack of planning on the part of the procuring services. To a large extent this has resulted from restrictive legislation, which has prevented such planning in the past. The Commission recommends that these barriers be removed. Competitive bid procurement system, long used by both services, must be modified to permit losing bidders to remain in the procurement picture and to prevent the concentration of business in certain strong companies. Such planning would obviate the violent and extremely costly fluctuations in production levels in individual companies and simultaneously preserve valuable design and production teams for future contracts.

At the root of this problem is the practice of the government to provide funds only for a single fiscal year. Past experience has shown that new aircraft, growing increasingly complex, cannot be developed to a production stage in a period of less than three-five years. An economy-minded Congress has inadvertently destroyed important new aircraft designs mid-way through the time-taking research and development phase. Commission urgently recommends that the Congress provide the Air Force and the Bureau of Aeronautics with forward contract authorizations for five year periods (instead of the current two fiscal years). Congress should retain its control over such money through its annual appropriations provided for the liquidation of such contracts. The services would be charged with integration of specific two-, three- or four-year programs into such overall five-year plans.

▶ **Mobilization Plans**—Commission believes that industrial mobilization planning should be given the same policy status as research, development and procurement within the services because of its vital reduction in the time required for the acceleration of production in emergency and accompanying reduction in required combat aircraft reserves. It rejects testimony for civilian control and recommends career officers with the same opportunity for advancement within the service as line officers. Complete production plans (including subcontractors, bills of material, tooling, schedules, etc.) for placing at least one model of each basic type of aircraft into production in a reserve plant should be prepared and kept up-to-date and plans for acceleration of production rates for current models be prepared by contractors for emergency use.

With such mobilization planning should go provisions for effectuation of such plans in the middle of a fiscal year through the declaration of an emergency by the President and immediate approval of such expenditures by the Congress. This plan would require inclusion in each annual budget of a figure representing such expanded production which, although not intended for passage at the time, would be approved by the Congress for immediate passage in the event of an emergency during the ensuing fiscal year.

Detailed recommendations of the Commission include:

• **Development Contracts**—Due to the large unknowns inherent in aeronautical research and development, the cost-plus-fixed fee contract should be used. In addition, the contractor should be permitted to retain certain design rights to his inventions as an incentive and the long-established practice of procurement contracts including all rights be abandoned.

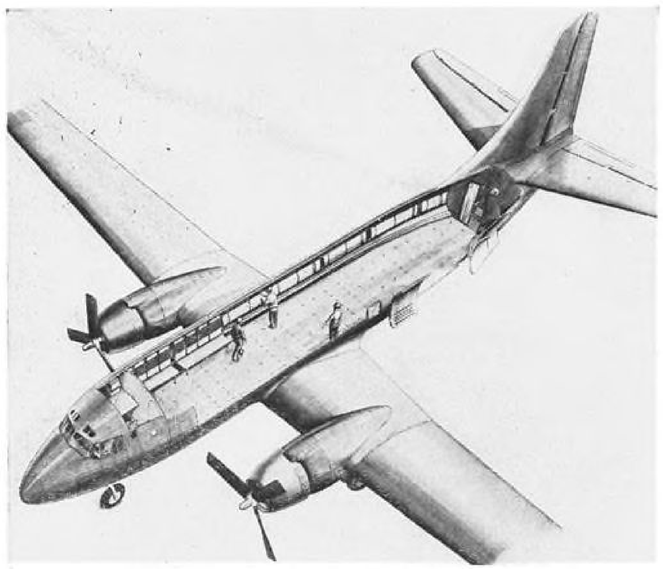
• **Production Contracts** — Incentives should be provided for the manufacturers to produce at low unit costs and low prices. Where high-volume tooling is used for low-volume production, the additional cost of such tooling should be entered as mobilization planning costs and so handled by the services.

• **Procurement Continuity**—To provide continuity of effort, each manufacturer should be permitted to have one type in quantity production, one in the development stage and a new experimental design under study at all times. The types in such process should be determined by the needs of the services and the individual skills of the manufacturer. Generally, the production contract should be awarded to the developing company in order that it be responsible for all subsequent design changes. Where such production contracts would overload the capacity of a given firm, the services should require that a substantial portion of the work be subcontracted and the parent firm provide all necessary engineering assistance and design changes to the subcontractor to enable the latter to produce the design economically and efficiently.

• **Production Dispersion**—The services are urged to avoid further production expansion in the current concentrations of capacity on the east and west coasts and to encourage the use of the presently dispersed reserve plants.

• **Reserve Capacity**—No further losses of reserve aircraft and engine plant capacity should be permitted and the present 21,200,000 square feet of airframe plant and 11,700,000 square feet of engine plant be maintained for continued availability. The program for the acquisition and storage of 65,000 general purpose machine tools should be completed.

• **Civilian Overhaul**—The overhaul of military aircraft under contract with civilian agencies trained in this work should be encouraged by the services because of savings in the cost of such work and the training and equipping of such civilian groups for use in emergency.



MILITARY MARTIN 2-0-2 OFFERED

Cutaway artist sketch of a military cargo version of the Martin 2-0-2 transport is shown here with 6 ft. by 8 ft. loading doors. As a military transport, 40 fully equipped combat soldiers can be carried. A hospital version accommodates 36 litter patients and four medical attendants. The craft can carry a 5½-ton payload and 1,550 gallons of fuel, sufficient for a 1,760-mile range. Commercial airline version of the 2-0-2 has been demonstrated to Air Force, Navy and Marine Corps officers at Wright Field and Washington National Airport.

NWA Sees Good Year

Northwest Airlines President Croil Hunter has predicted that revenue passengers on NWA's domestic routes may increase 50 percent from 660,000 in 1947 to 1,000,000 in 1948. Previously, American Airlines had forecast a 17 percent increase in revenue.

Piasecki Names Rupert Materials Manager

Piasecki Helicopter Corp., Morton, Pa., has appointed Brestle A. Rupert material manager of the manufacturing division and he will be responsible for procurement and planning. Under his direction will be sub-departments on material control, production control, purchasing, subcontracts and stores.

Rupert's appointment was made necessary by the company's continued expansion and emergence as an important producer of service helicopters rather than as an organization concerned mainly with research. He formerly was purchasing agent for Fairchild and at one time in his 20 year-career in aircraft manufacturing was production manager at Martin.

In other personnel actions:

▶ **Glenn L. Martin Co.** named Dr. Karl Kammermeyer manager of research and development of the chemicals division at the Baltimore laboratory. Dr. Meyer H. Danzig was appointed director of research. E. H. Sorg, previously head of products research, became Kammermeyer's assistant, and S. N. Greene will take over Sorg's former duties. A. M. Stover, formerly in charge of compounds and process development, has been appointed director of development.

▶ **Goodyear Aircraft Corp.** has added John B. Rieker to its sales staff. He will be special representative for the company's lighter-than-air interests with headquarters at Akron, Ohio. Rieker is a veteran airship pilot with over 6,500 hours in blimps and free balloons.

▶ **Curtiss-Wright Corp.** appointed Kenneth P. Schmidt, manager of the industrial relations department of Wright Aeronautical Corp., Wood-Ridge, N. J. Schmidt joined the corporation in 1942, previously having been associated with the Manufacturers Trust Co. of New York, for more than ten years.

▶ **General Electric Co.** named Robert L. Gibson, manager of the newly created personnel division of the chemical department which has responsibility for matters pertaining to employee relations, union relations, community relations and educational activities in the various divisions and plants of the department. Gibson will also continue as manager of the advertising and sales promotion division. He will be assisted by Everett W. Bickford, manager of union relations, George M. Hartley, supervisor of planning and preparation, Karl B. McEachron, Jr., manager of educational activities, and Arthur G. Sanford, manager of personnel services and safety.

▶ **General Controls Co.** appointed Don. S. Bentley, factory branch manager at Los Angeles. Bentley has been with the company for some time as factory sales supervisor. He will direct his efforts to further the company's sales and service in the following states: Southern California, Arizona, sections of Nevada, New Mexico, and Texas. The company also appointed F. E. Weldon as factory branch manager of their New York office; and C. G. McCarthy as their Detroit factory branch manager.

▶ **SKF Industries, Inc.** appointed John H. Tipton, assistant district manager the Cincinnati office; M. H. Courtenay, assistant district manager of the Atlanta office; and E. A. Hutson, field engineer in the railway sales department of the Chicago office.

▶ **John A. Roebling's Sons Co.** appointed E. George Hartmann, general sales manager. Hartmann has been associated with Roebling since 1940 and has had over 29 years experience in the wire field.

▶ **United States Plywood Corp.** appointed J. Thomas Arens, manager of the branch warehouse at Baltimore, Md. Arens was formerly corporation salesman in Philadelphia. He replaces T. S. Hauck, who has been promoted to special field contact representative.

CIO Tells Aviation New Wage Demands

Aircraft and airframe management having contracts with the United Automobile, Aircraft and Agricultural Implement Workers, CIO, has been served notice by the union's international executive board of new demands for wage increases and other economic benefits expected when current contracts expire.

Topping the list is a demand for a 25-cent hourly wage increase which the UAW-CIO estimates will be necessary by May to restore the workers' "buying power" to what it was in June, 1946, when Congress relaxed price controls. As a precautionary measure, local unions have been advised, when beginning negotiations, to reserve the right to revise the demand upward if the cost of living between now and May rises more rapidly than the union contemplated.

The UAW-CIO 1948 third-round wage program contains three other demands: (1) an increase of 5 cents an hour for hospitalization, health, medical and surgical insurance; (2) guaranteed weekly wage; and (3) three weeks' paid vacation after five years of service.

Requests for pension plans were left to the discretion of local unions or groups of locals dealing with individual corporations. At General Motors, the UAW-CIO will ask that 10 cents of the 25-cent hourly increase be applied to a retirement plan.

New Engineering Service

A new aspect of aircraft engineering service to foreign airlines, relieving them of the costs of maintaining resident representatives at U. S. factories producing their transports, is disclosed by a Los Angeles engineering group.

Cloyd Smith, head of Masco Engineering Service, 2119 Sepulveda boulevard, has begun circularizing foreign airline companies with a carefully-planned proposal to represent them during development of transports now on order with major plane builders. His firm presents, on a sliding scale, a per-hour fee of work done for the airline for periods of from 5-hr. (minimum) per month to 140-hr. and up per month. Services offered include: aircraft inspection; expedition of parts; witnessing special tests; preparation of technical reports; supplying data on new designs; checking changes with C.A.A. and manufacturer, procurement of prints.

Rocket Researchers Sift Fuels To Reduce High Consumption

Nitric acid seen offering distinct advantages on basis of specific consumption by weight and by volume . . . Various fuels are evaluated.

By ROBERT McLARREN

Tremendous fuel consumption of the rocket motor (for example, 14.5 lb. of fuel per lb. of thrust per hr. in the V-2) poses the major rocket research problem. Attempt at its solution has taken several general paths since the rocket became a major military weapon. One of these is the utilization of high energy fuels, which produce a maximum heat from a minimum weight.

On the basis of high specific impulse (pounds of thrust created per pound of fuel burned per second) a mixture 20 percent liquid hydrogen and 80 percent liquid oxygen produces a specific impulse of 350 sec.—highest of the rocket fuels generally available. However, specific impulse is only one criterion for use in the selection of a rocket fuel. Of equal or greater import are the density and volume of the fuel, exerting a direct influence on the size of the rocket-propelled missile and the weight and complexity of the various parts of its fuel system. It is in this consideration that nitric acid warrants close study.

► **Fuel Comparisons**—A study of nitric acid as a source of oxygen for a rocket fuel in comparison with liquid oxygen (generally in use in current U. S. rocket motors) and peroxide (used as the V-2 turbine drive and in the ME 163 Walter rocket motor) was made by Helmut Zborowski of the German Academy of Aeronautical Research, a translation of which by the National Advisory Committee for Aeronautics is now available.*

On the basis of the total heat liberated, liquid oxygen is 47 percent better than nitric acid and 56 percent better than peroxide when burned with a liquid hydrocarbon. However, more than 35 percent of the energy of the liquid oxygen is lost through dissociation, more than twice the loss of nitric acid fuel and more than four times that of peroxide fuel. In addition, another 13 percent is lost through vaporization, a total heat loss of 48 percent of the liquid oxygen fuel.

Thus, of the total 2,500 kg. cal./kg. of energy liberated by combustion of liquid oxygen and a liquid hydrocarbon, only 1,300 kg. cal./kg. are available as kinetic energy in the nozzle jet of the rocket motor. By comparison, a nitric acid-hydrocarbon rocket fuel provides 1,080 kg. cal./kg. as kinetic energy, a difference of only 10 percent in the two fuels.

► **Nitric Acid Advantages**—It is on the basis of specific consumption by weight and by volume that the superiority of nitric acid is advanced. The consumption of liquid oxygen in a rocket engine operating at 35 atmospheres pressure is 6.3 kg./ton sec. compared with only 4.6 for a nitric acid fuel. On a volume basis, oxygen is consumed at the rate of 6.3 liters/ton sec. while nitric acid is used at a rate of only 3.35 liters/ton sec.

Practical significance of this lower volumetric consumption lies in the greatly increased heating energy which can be stored in a missile of a given frontal area, using nitric acid as a source of oxygen rather than liquid oxygen. Assuming a ballistic loading per unit area of 0.3 kg./sq.cm. and a propellant weight to takeoff weight of 0.4, the nitric acid missile would have a range more than 17 percent longer than the liquid oxygen missile.

Other significant advantages of nitric acid as an oxygen source for rocket motors include wide availability, desirable ignition behavior, advantageous freezing point of −42 deg. C., ease of obtaining complete combustion, stable structure eliminating spontaneous decomposition, ease of transportation and storage, and a low vapor pressure. An important consideration is the fact that a wide variety of readily available hydrocarbons and other organic compounds capable of ready reaction with nitric acid have been developed and many of them tested. Spontaneous reacting propellants eliminate the need for an ignition system within the rocket motor, thereby further simplifying its construction and cost.

► **Objections Analyzed** — Wide-spread objection to nitric acid as a highly corrosive fuel requiring special metals or ceramics for handling has been based on the use of aqueous solutions. The water present acts as a catalyst enabling the acid to attack contacting metals. In a rocket fuel, only a highly concentrated nitric acid is used, the freedom from water preventing corrosion. Nitric acid in this concentrated form causes metals which are otherwise readily oxidizable, to become passive and prevent corrosive action. Iron possesses this characteristic as does aluminum and chromium in progressively greater degree. However, this balance of characteristics makes mandatory the use of moisture-proof containers for storage, as moisture-laden atmosphere would dilute the contents and initiate an acid-metal action. Ceramic materials, such as porcelain, glazed stoneware, baked enamels, and glass are impervious to nitric acid in even diluted form.

Another objection to nitric acid, its toxic danger to personnel, exists only at comparatively low temperatures, when it combines with oxygen from the atmosphere to form nitrogen dioxide poison gas. However, at combustion chamber temperatures above 1,600 deg. C., practically complete decomposition of the nitric oxides takes place.

► **Nitric Fuels Improved** — Improvements in nitric acid rocket fuels have already been demonstrated as feasible: By dissolving nitrogen dioxide and nitrogen pentoxide in nitric acid, the density of the latter can be raised from 1.52 to 1.62, the volumetric fuel consumption lowered 6½ percent, and the gravimetric consumption lowered 2½ percent. These factors also lower the freezing point and improve the ignitability of the fuel.

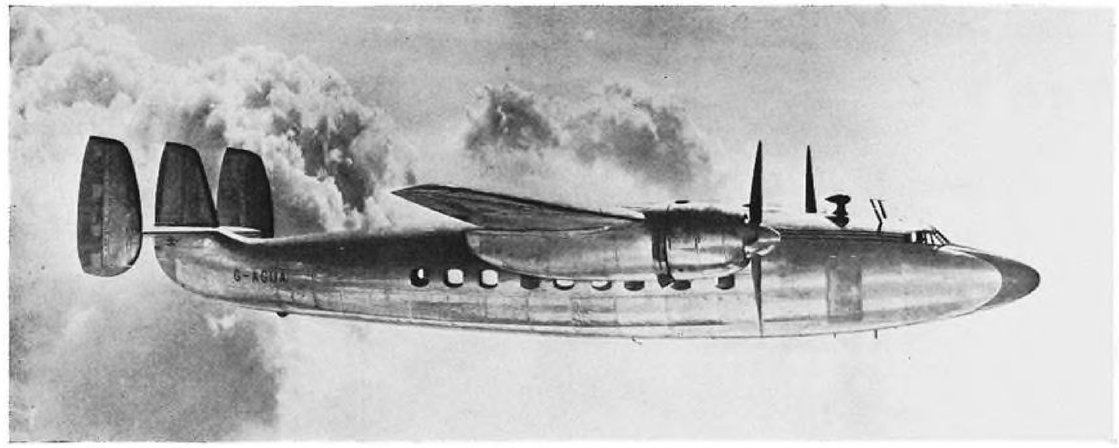
Addition of a four percent by weight of iron trichloride can produce a substantial reduction in the ignition delay time, which has already been demonstrated to be only one thousandth of a second. This fast ignition, if further improved, may permit the design of intermittent rocket engines, a long-sought configuration with vastly increased range over present designs.

REFERENCE

*Zborowski, Helmut: Rocket Power Plants Based on Nitric Acid and Their Specific Propulsive Weights. NACA TM 1145.

STEEL DATA

The Engineering Data Book Sheet D-43, "Principle Applications of Aircraft Alloy Steels," published in AVIATION WEEK, December 22, 1947, was based on material compiled by L. C. Boyd, Alloy Service Metallurgist, of the Carnegie-Illinois Steel Corporation. This information was inadvertently omitted due to space exigencies.



Airspeed Liner New Export Rival

Competing with U.S. makers, British company produces versatile high-speed plane featuring advanced engineering refinements.

By ALBERT E. SMYSER, JR.

British European Airways' announced intention to order from 20 to 30 Airspeed Ambassadors, puts this once "ugly duckling" of the British Ministry of Supply and Production well in the forefront of the race for orders from airlines on the Continent.

Featuring high cruising speed together with reported fundamental advantages for the operator and passenger, and various seating arrangements from 28 to 48 passengers in both pressurized and unpressurized versions, the Ambassador may well prove to be a serious rival in export sales of the American twin-engine transports now in that market. (Consolidated Vultee already has European orders for its Convair-Liner.)

▶ **Design Considerations** showing current trends in English aircraft engineering are reflected in this British transport.

The large span, low drag wing of the Ambassador is said to be one of the main factors in the achievement of its high economical speed. Wing is of greater aspect ratio (11) than has been customary, yet it has quite a moderate thickness-chord ratio at the root.

With high performance aircraft, one of the designer's greatest problems is that of obtaining the necessary span for a reasonable structure weight while maintaining minimum root thickness. The half-span to root thickness ratio or "overhang" ratio, probably has a greater influence on the relative efficiency than any other single factor.

Since the Ambassador's wing has been designed to retain a high proportion of laminar flow, a very rigid skin surface was needed, and the structural requirements linked up well with those required to keep the overhang ratio at a high figure. Skin flexing can only be avoided by the use of a thick and well-supported surface, and it was considered that it would be wasteful to cover a wing in this manner unless the skin structure itself was used to a maximum extent in dealing with bending and torsional stresses.

In this wing, skin thickness and stringer-pitching have been carefully graded along the span, and the skin, with its stiffeners, takes some 90 percent of the bending loads at the root end of the outer wing. An overhang ratio of 21.2 has been attained.

By preserving laminar flow far back toward trailing edge, a very low level of profile drag has been achieved. Here the advantage of the twin engine layout, in combination with a large span, can be seen; the region of disturbed air behind the propeller arcs representing only 30 percent of span.

Cleanness of form and smoothness of skin have been emphasized. Many refinements of detail reduce unnecessary drag.

It is believed that the slightly increased constructional costs will, when spread over five years or more of operation, be offset by added revenue-earning miles covered at the greater speed—quite apart from the value of this speed itself—since high utilization and aerodynamic efficiency is usually reflected by lowered costs.

Considering the component parts of the plane, various design characteristics were found to embody interesting details.

▶ **Fuselage**—Structurally, the pressurized fuselage is of conventional form, with skin stiffened by built-up frames and stringers. Majority of the stringers are Z-section pressings, but are separated, in groups of four, by T-section extruded longerons to give additional strength. At wing spar stations there are two exceptionally massive frames, which are built up box-members to carry wing loads. Along each fuselage wall, and up to a point some six inches below window baseline, there is a boxed duct for ventilation. Special box structures provide additional strength at window cut-outs. Although the cross section of the fuselage changes considerably throughout its length, the structure remains essentially similar. The rear luggage compartment wall forms the pressure bulkhead.

Passengers enter through an upward-opening door on the port side at rear of cabin, and this door is supported by an integral strut. Similar struts are used also in the doors to rear baggage compartment and to forward starboard door used for crew entry and for loading forward baggage compartment. In addition, there are two emergency exits above window level.

► **Center Section**—Center portion of the wing is built up around two plate-web spars with extruded L-section spar caps. Interspar ribs are of the diaphragm type, those in the central section being cut away for the installation of auxiliary fuel cells in the tunnel so formed.

Attachment of the center section to the fuselage is made through eight high-tensile steel-strap fittings, four, attached vertically outboard of fuselage, taking lift loads, while diagonally attached inboard fittings take side loads. Drag stresses are taken by heavy gage flanged angle members riveted to the inside of fuselage skin and to center section. The three inner ribs in the center section have fork and lug attachments to fuselage roof structure for transmission of longitudinal loads where fuselage is cut away to take the wing.

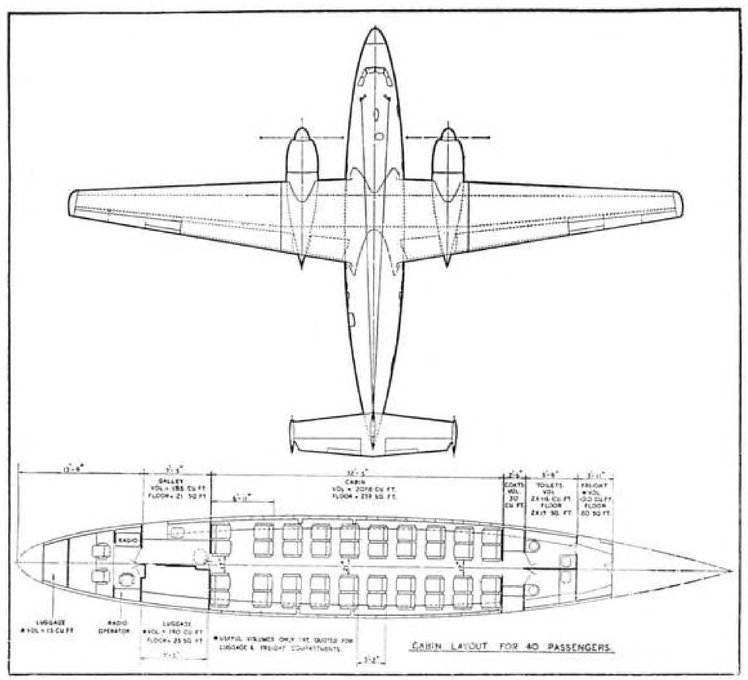
► **Outer-Wing**—Two interesting features are found here. Attachment is made to the center section virtually through the skin itself; and the fuel tanks at each root end are integral parts of the structure. There is no direct connection between the center section and the outer wing spars, though there are rack fittings for transmission of lift and torsion loads. Remaining stresses are transferred through joint plates with spanwise bolts and spools. Thus, the outer wing section is easily and quickly removed.

Outer wing spars are similar to those used in center section, the caps being progressively lightened, by machining, towards wing tips. Outboard of the tanks the interspar ribs are girder braced members, and the extruded stringers are fanned out from front spar as skin stresses are reduced towards wing tip. Skin thickness varies between 14 and 18 gage over the wing surface, depending on the stresses taken.

While the leading edge structure at the center section is of the unit type, with access doors hinging forward in the undersurface, that of the outer wing is designed for thermal anti-icing and has usual corrugated inner skin supported on pressed-sheet nose ribs. Hot air in the anti-icing system flows between corrugated and outer skins.

► **Fuel Tanks**—The wing structure with its heavy gage skin is said to lend itself naturally to the installation of integral tanks, in the comparatively thin wing section, offering a worthwhile saving of weight. Normal fuel load is 1,000 gal. in two tanks. These tanks are well outboard of the engine nacelles and are substantially free from distortion effects due to heavy landings.

Spar webs form the front and rear walls of these tanks, with a ventilated cavity between front spar and the insulating diaphragm behind the heated leading edge. Ribs in the wing tank section are plate webs with internal cut-outs and act as anti-surge baffles. Tanks are designed and constructed to be leak-proof, but, as an additional precaution, the inside surface is also covered with sealing membrane. Extensive load and vibration tests have been made to ensure permanent fuel-tightness even without this additional safeguard.



All sides of each tank are accessible and the interior of each can be reached through a manhole at its inner end. Fuel supply is taken from a large capacity sump, and provision is made both for pressure and gravity refuelling.

In addition to the integral tanks, arrangements are made for fuel cells, with a capacity totalling 600 gal., in the center section.

► **Tail Unit**—Structural features of the tail unit are similar to those of the wing. The cantilever tail plane is a two-spar structure with pressed sheet ribs and is attached by blade forgings to the fuselage. Featured are interchangeable outboard fins. Both the tailplane and the fins have thermal ducts arranged similarly to those of wing.

► **Control Surfaces**—With the exception of the split trailing-edge flaps, all movable surfaces are fabric covered.

• **The three rudders** are directly interconnected, permitting use of a single torsion spring-tab to lighten control movement. This tab is also used for trimming. Outer rudders are interchangeable, and have small horn balances carrying mass-balance weights.

• **Ailerons** are each in three portions with universal couplings. Both geared and trimming tabs are used.

• **There is a rigid** connection between the spars of the two elevators, which have adjustable geared tabs and are mass balanced.

All the control surfaces other than the center rudder, have shrouded leading edges, and are sealed so that full pressure difference is available for aerodynamic balance.

• **Split trailing-edge flaps**, covering 25 percent of the wing chord, are mounted immediately inboard of ailerons. These are hydraulically operated through toggle-arms actuated by a laterally moving push-pull rod. They can be set at any angle up to 50 deg. from closed position.

► **Control System**—To minimize the effect of cable slack and to compensate for expansion difference in varying temperatures, a special control-run system was developed.

Rack and pinion gear units at each end of the elevator and rudder control systems transform a movement of 5 in. at the control column and rudder pedals to one of 25 in. in the main run of the cables. These cables, consequently, carry a much smaller load, and a lighter and more flexible cable can be used to reduce static friction and other losses at the pulleys. A similar gearing system is used in the aileron control run, with screwjacks replacing the gear boxes at the control surfaces.

The control system has been laid out so that direct-operating servo-motor type of electric automatic pilot may be installed without further modification.

► **Hydraulic System**—Within the limits set by the need for safe and practical operation in all conditions, the auxiliary equipment may be described as being all-electrically powered. The undercarriage, flaps, nose-wheel steering, and brakes are directly operated by hydraulic means, but power is provided by an hydraulic accumulator pressured by an electrically driven hydraulic pump.

This arrangement permits a minimum of hydraulic piping and accessories, considerably reducing weight and complication of the installation. Pump and its motor are in use only at infrequent intervals. The various services may be operated at all times, either by using the aircraft's own battery system or a ground supply. In event of main power or other electrical failure, the hydraulic accumulator maintains the pressure for one operation of all services—including brakes after landing.

Both hydraulic pump and accumulator are in the nose of the aircraft and are immediately accessible through the hinged nose-piece.

► **Landing Gear**—The tricycle undercarriage has been designed so that lowering is completed by gravity, assisted by the drag effect of air pressure—an action which is both positive and simple. The motion is damped, and lowering is completed within 5 sec., while retraction is completed in 7 sec.

Location of main undercarriage wheels is at mid-chord, and use of wide track and long wheelbase ensures ground stability. Use of pedal type brakes and a steerable nose-wheel permits the controls to remain locked at all times while the craft is on the ground, reducing the difficulty of taxying in strong winds.

Dual wheels are used, and because full load can be handled when any one of the tires has been deflated, this is considered a useful safety point.

► **Anti-Icing**—Hot air from two gasoline combustion heaters in the center section is fed through ducts along the leading edge from which it is regulated to flow chordwise, and evenly, in close initial contact with the lengths of the upper and lower leading edge surfaces and as far rearwards as the front spar, where it enters the wing structure and is emitted along the trailing edge. A third combustion heater in the rear fuselage supplies hot air to the tail surfaces.

Necessary air supply is ram-fed through leading edge intakes which (when not in use) are closed by flush-fitting, electrically operated flaps.

► **Pressurization**—Cabin conditions equivalent to a height of 8,000 ft. can be maintained at an outside pressure-altitude of 20,000 ft., with similar relative differential at intervening heights. Two supercharger units deliver filtered air through the heaters, coolers, and silencers to the cabin duct. Each of these blowers, alone, provides a sufficient volume of air to maintain correct cabin conditions when the engines are turning at cruising speed. In event of engine failure, increased revolutions of the good engine, necessary to maintain flight, increases the blower output beyond the minimum required. Relief valves limit the pressure differential to the designed 4 psi.—though the fuselage has been stressed to handle a load of twice this figure.

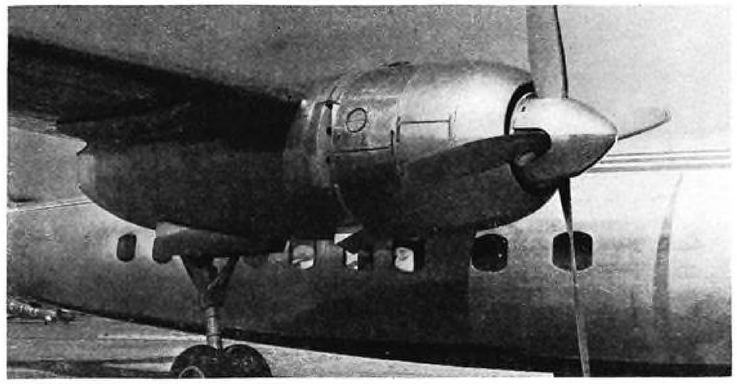


Photo shows excellent visibility provided by high wing design. Note that engine nacelle has only one protuberance extending into the slip stream. Cowl flaps and oil cooler shutters operate internally and are thermostatically controlled with a manual over-ride for emergency operation. Power-egg installation facilitates quick engine change.

Ambassador Basic Data

DIMENSIONS

Span	115 ft.
Length	80 ft. 3 in.
Height	18 ft. 10 in.
Wheelbase	25 ft. 6 in.
Track	27 ft. 6 in.
Wing area	1,200 sq. ft.
Mean chord	10 ft. 5 in.
Root chord	15 ft. 7 in.
Aspect ratio	11

SPEEDS

Max. cruising lean mixture at 10,000 ft.	282 mph.
Recommended economical cruise at 12,500 ft.	255 mph.
Minimum economical cruise at 10,000 ft.	195 mph.
Stalling speed—full load wheels and flaps down	86 mph.
Stalling speed—full load flaps up, ICAO takeoff	105 mph.

TAKEOFFS, CLIMBS, CEILINGS (Normal)

Distance to 50 ft.	3,900 ft.
Rate of climb (rich mix.)*	1,450 ft./min.
Rate of climb (lean mix.)*	1,010 ft./min.
Cruising ceiling	25,000 ft.
Absolute ceiling	27,500 ft.
Landing distance from 50 ft.	2,640 ft.

*at 5,000 ft.

TAKEOFFS, CLIMBS, CEILINGS (single engine)

Distance to 50 ft. (engine failure at safety speed)	5,040 ft.
Safety speed	126 mph.
Minimum speed for asymmetric rudder control	98 mph.
Rate of climb (gear up, prop windmilling)	385 ft./min.
Rate of climb (gear up, prop feathered)	525 ft./min.
Rate of climb (gear down, prop windmilling)	190 ft./min.
Rate of climb (rich mix. at 5,000 ft., enroute climb)	330 ft./min.
Cruising ceiling	11,500 ft.
Wing Loading	39.2 lb. sq. ft.
Power loading—takeoff	8.75 lb. bhp.

Cabin air is induced through a vent in the undersurface of each side of center section by motor driven fans which can feed it through the heaters. Fans and heaters are duplicated and can be operated either in the air or on the ground. A properly conditioned atmosphere can therefore be maintained throughout the interior, during ground stops, in varying climatic conditions.

► **Control Cabin**—In its standard form, the cabin is laid out to accommodate a flying crew of three (two pilots and radio operator). The central pedestal is conveniently arranged. Each pilot has his own blind-flying panel, on which the master instrument is a D. R. compass.

All engine and auxiliary instruments are centrally placed so they may be seen from either seat, and dual-pointed dials are used whenever possible to reduce overall number of instruments. Torquemeters are included to enable the crew to maintain optimum engine-running conditions, and to give early warning of any possible failure.

All information lights—which include a "safe-to-takeoff" indicator are laid out together on the captain's side of the dashboard, while non-essential switches and controls are on a panel to right of the captain's seat. Both ultra-violet and red lighting systems are provided.

A simple propeller-braking system has been developed. In this the throttles, when in the braking sector of the quadrant, are moved in a natural sense for swing correction. Since the reversing switches are throttle operated, the pilot's hands do not have to be removed from the throttles at the moment of propeller braking. This promotes added safety in operation.

Safer landings . . . . fewer delays . . . with BARTOW beam-controlled high intensity APPROACH AND RUNWAY lighting

Main ILS runway at Wold-Chamberlain Field, Minneapolis-St. Paul, showing new Bartow high intensity runway lighting as pilot sees it just before landing. Range lights in foreground. Runway has the latest type Bartow beam-controlled units, as shown at left.

Maximum safety, minimum passover, less stacking up and shorter landing time, fewer cancellations and delays—these are some advantages of Bartow high intensity approach and runway lighting systems.

Airline landings are made regularly, safely, under low visibility conditions, without reducing present proved minimum safety standards. When, for example, reported ground visibility is given as ¾ mile, Bartow lighting increases cockpit visibility of the runway to one mile.

This lighting was first developed over 10 years ago by Bartow Beacons, Inc., and with the cooperation of L-M lighting engineers, has been steadily improved. During the war it was installed by the army and navy at hundreds of locations throughout the world. Pilots who flew in the Aleutians, Newfoundland, and other tough-flying areas can tell you what Bartow lighting did to bring them in to safe landings.

Principles of Bartow Beam Control . . . How it Works

Lights are spaced at 200-foot intervals along the runway. As the pilot approaches, he sees two rows of lights, delineating the runway and giving him the necessary perspective. Under limited visibility, the first pair of Bartow units points two beams of light at the place where the pilot will be when he *must* see, as he goes off instruments and onto visual contact.

As he moves forward another 200 feet, he comes into the meeting point of the second pair of beams. He still sees the first pair; but even though he is closer to them, he is just out of their point of focus, and they appear no brighter than the second and successive pairs. All appear of equal brightness, because the light beams reach him at different angles. There is no glare to obscure the more distant lights.

"Coned-in," and stepped up

When dust, fog, rain or, worst of all, daylight snow lower the visibility, light intensity is stepped up, and beams are "coned-in" or toed-in so that beams from each side of the runway meet at the greatest distance conditions permit. Each unit has up to 180,000 beam candlepower to push the light through murky weather. In clear weather intensity can be cut as low as one percent.

Only two simple controls

Intensity and focus are controlled from the tower. One five-point switch changes taps on the transformer to change the voltage. One toggle switch moves a pointer back and forth to the required "Visibility" figure on a day or night chart—and synchronous motors in each unit aim the fingers of light at precisely the right point. It's as simple as that!

The L-M Bartow lighting is the only completely controlled system, and has the highest light intensity of any runway system developed to date. Usually it is the most economical to install. Units give 360-degree visibility but concentrate the light without glare where it is most needed—toward the pilot.

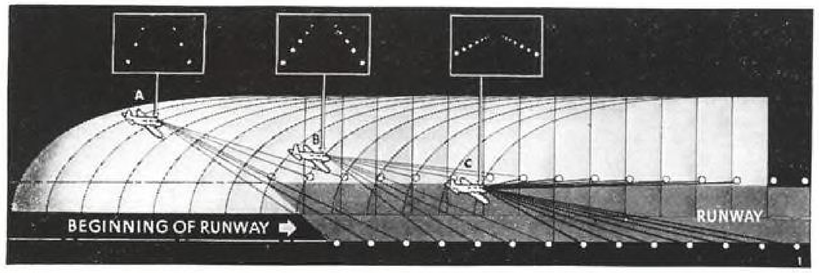
Fully approved by CAA

The Bartow system is the first high intensity lighting given *full* CAA approval—the only one *flight-tested and fully approved* to date. This lighting, combined with approved instrument systems, gives maximum safety for all-weather airport operation.

Write for this Brochure, "The Lights that Bring Them In"

A scientific explanation of the principles involved in approach and runway lighting. Illustrated with many charts similar to those on the opposite page. If you are concerned with runway lighting, send for a copy. Please state your position or business connection. Address Line Material Company, Airport Lighting Division, East Stroudsburg, Pennsylvania.

Charts show principles of Bartow Beam-Control

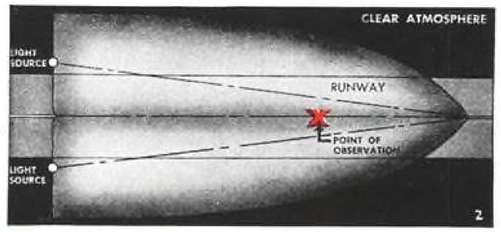


1.

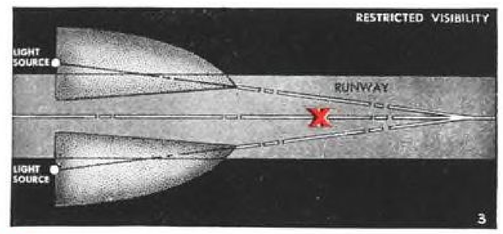
To land, the pilot must see two rows of lights to establish necessary perspective. Chart shows approach on a Bartow equipped runway. At "A" the pilot has entered the effective area of three pairs of lights. At "B" and "C" he sees progressively more lights. Light intensity of the nearest unit is the same as of the farthest.

This system permits use of extremely high candlepower at low angles, giving maximum cockpit visibility—where it is needed most—without glare or halo.

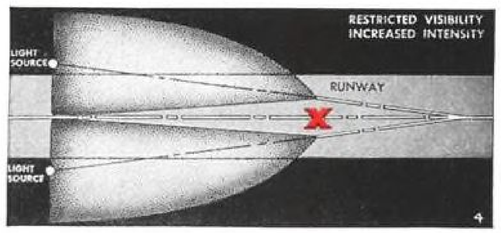
(Charts are from the Brochure, "The Lights that Bring Them In," described on opposite page. Angles are exaggerated.)



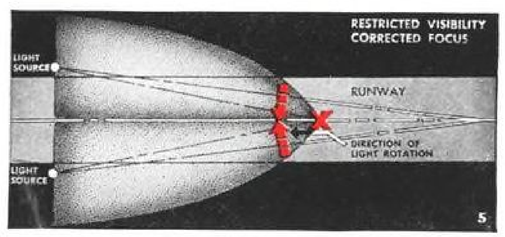
2. Effective envelope of light, in clear atmosphere, of one pair of lights—one on each side of the runway. Each light is of equal brightness along the center zone of the runway. (To simplify this explanation, only *one pair* of lights is shown, although the pilot always sees *two rows* of lights, one on each side of the runway.)



3. Restricted visibility: the envelope of light shrinks in fog, dust, etc. Penetration of the high candlepower beam is reduced more than the low candlepower beam, and the effective areas fall away from the center line of the runway. This lighting would be ineffective—the pilot could not see the lights even if he were in the right position!



4. Increased intensity alone does not restore the path of equal brightness shown in chart No. 2 above. Increasing the candlepower increases the penetration of the low candlepower beam, but the high intensity beams are still not reaching the pilot, leaving a dark path in the center from which the lights are not visible.



5. Corrected Beam Direction, with lights "coned-in" toward the center line of the runway, eliminates the dark area, restoring the path of equal brightness. Thus the *combination* of brightness control and beam direction control gives maximum penetration, without glare or halo, under any given atmospheric condition.

Unique Rotor Affords New Safety

Design aims to minimize fatigue stresses and overcome roughness.

By GILES N. MONTGOMERY
(Engineering Staff, Doman-Frasier)

Although the helicopter is finding wider commercial utility every day, it is evident that problems still besetting this configuration have prevented its assuming its ultimate role. For example, the basic question of how many and what types of rotors and blades is still one of the primary subjects of discussion among engineers and designers.

Vying for attention in this area is the Doman rotor system. Doman-Frasier Helicopters, Inc. have not concerned themselves with the controversy of how many rotors the helicopter shall support or in which of the many possible ways they shall be arranged, but rather with the basic concept of the rotor itself. Emerging from this research is a rotor which is new in approach and solution.

► **Rotor System Characteristics**—During the 26 hr. already logged with the Doman rotor system, these observations have been made:

• No system parts have needed replacement because of wear or failure. Parts have been changed, however, because they did not perform in accordance with design calculations—something which may be expected in test research.

• The helicopter (Sikorsky R-6) on which the Doman rotor has been installed has been repeatedly flown at sustained speeds in excess of 100 mph. carrying 500 lb. of disposable load. (The world's speed record for 'copters is 114 mph.—Sikorsky R-5.)

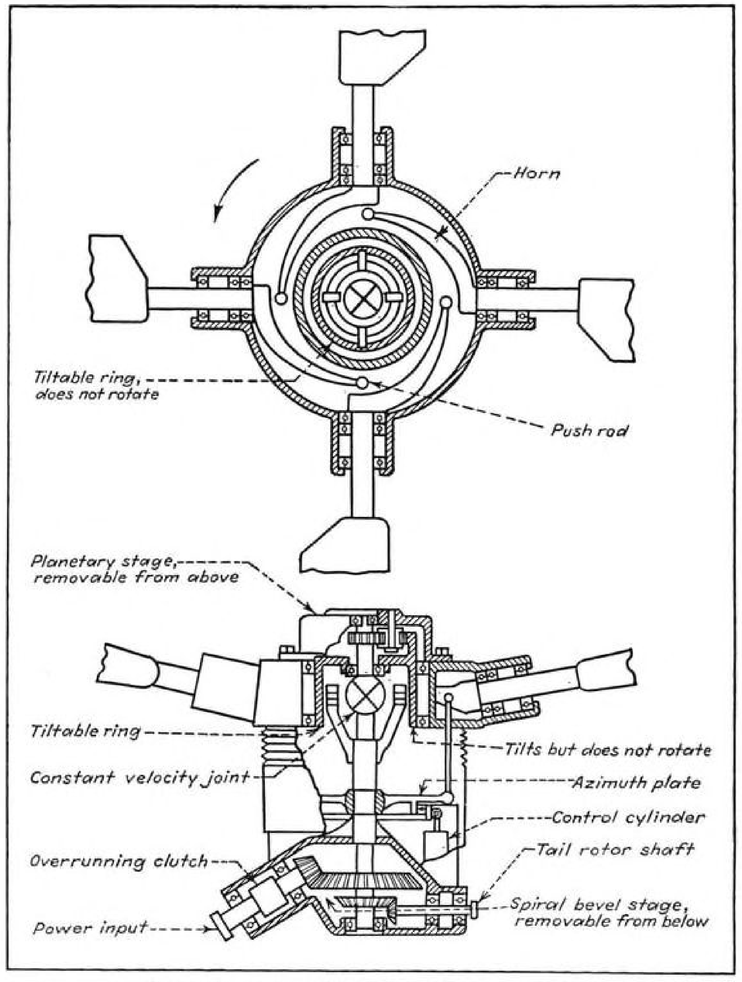
• Stress measurements of the rotor blade shanks have been made in all regimes of flight. A Goodman diagram made for these findings indicates that in the matter of fatigue, the rotor blade life will be infinite.

• At 100 mph. forward speed, the vibratory stress in the rotor blades is less than one-tenth their endurance limit.

• The aircraft is without rotor-induced vibration throughout the flight range and in any normal 'copter maneuver.

• There is no pilot control stick shake at any speed, and only finger tip pressure is required to guide the craft.

• The craft has been flown with center of gravity changes of as much as 15 in. with no changes encountered in the stress on the blades or variations noted in the handling characteristics of the 'copter.



Schematic representation of Doman-Frasier rotor head.

• The autorotative characteristics are excellent.

• There is complete freedom from ground resonance.

• The rotor mechanism is simple insofar as number of parts required is concerned. All non-standard parts may be safely made from castings or turnings. No forgings are required.

• The Doman rotor-equipped 'copter cannot be flown for long periods hands off, and will not lift a greater load than any other well designed 'copter.

• Capability of achieving a higher speed with the Doman rotor than with other designs of similar disk loading, power, and tip speed is due solely to the absence of vibration and to low blade stresses at high speed.

► **Rotor Problems**—General factors affecting rotor design and their relation to the Doman system are given in the following breakdown:

• **Control**—With one exception, all single lifting rotor 'copters achieve directional control by cyclic pitch change of the blades. Mechanism is provided, which in effect will cause each blade, as it passes one side of the craft, to reduce its pitch, and while it passes the other side to increase its pitch. Each blade will thereby have high lift on one side and low on the other. However, the blades are in rotating motion, and so are subject to gyroscopic phenomena. For this reason, if the point at which the blades experience their highest lift be considered as a force applied to the rotor at one point, the entire whirling mechanism will respond in gyroscope fashion by exhibiting a pronounced tendency to tilt at 90 deg. to the applied force.

By making available to pilot the ability to select at what point about the craft the blades shall pass through the area of high and low lift, the lift vector of the rotor may be inclined in any direction relative to the fuselage C. G. This system provides an effective means for flight in any horizontal direction and is the system used on the Doman rotor.

Devices worked out to accomplish this cyclic pitch change are many, but they all work down to becoming a flat plate cam whose magnitude and direction of inclination may be controlled by pilot. The individual blade is equipped with actuating mechanism so that as a push rod from the blade rises and falls in its circular path around the inclined cam the blade will increase and decrease its pitch. This cam is known as the azimuth plate or swashplate.

Another conception of achieving directional control is one in which the C.G. of the entire aircraft may be shifted relative to the rotor head. One aircraft has reportedly been flown by this method.

• **Attachment of Blades**—Although cyclic pitch change will effectively shift the center of lift relative to the hub and so tilt the craft, if the blades are rigidly attached many difficulties are encountered. The pendular action of the fuselage will in itself place forces into the rotor which will unfortunately respond by tilting at 90 deg. to the force. Conceivably, pilot could, by training, learn which way to move his control stick to correct for this, but it would be anything but natural.

A second consideration is the stress reverses that would occur in the blades every revolution when cyclic pitch is applied to handle a C.G. change in the aircraft. Under such condition the blades would be called upon to hold the craft in a given attitude by sheer bending which would ensue in a pulsing movement every revolution.

Some method must be employed so that the rotor head will not be affected by these dangerous conditions.

Most common path away from this problem is to provide each blade with a horizontal hinge at its root. The blades are then free to rise and fall at will (flap). Centrifugal force acting on the rotating blade mass will tend to keep the blade out horizontal. Aerodynamic lift will try to raise the blade. The blades arrive at a coned position where these two forces balance. The shank bending moments in the blades due to supporting the craft are removed because the blades are now in pure tension in the vertical plane. The aircraft is supported in the air by the vertical component of the tension force on the coned blades.

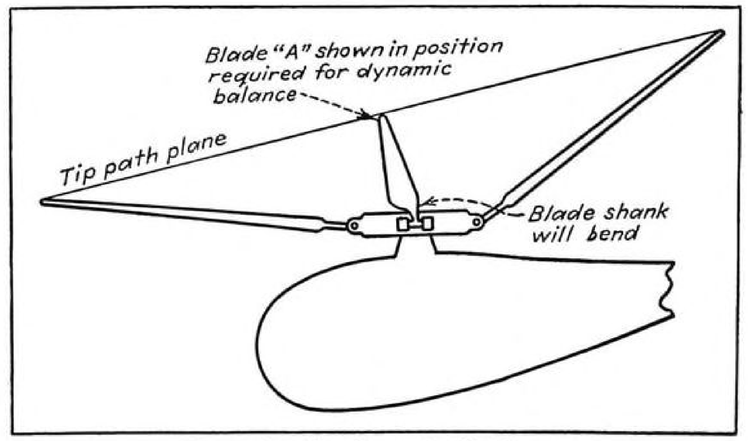


Diagram of coriolus effect on four-bladed rotor.

This is a very neat and simple solution, but it leads to a series of new and staggering problems, which will be weighed. It is not the method used in the Doman rotor system.

Another method of divorcing the rotor head from the aircraft is to keep the blades rigidly attached to a hub, and then attaching this hub to the craft with a universal joint. This is the scheme used on the Doman rotor. This system is also not without ensuing problems, but they are fewer, and new solutions have been found which are eminently satisfactory.

• **Flapping Hinge Bearing**—In a 2,500-lb. 'copter, the centrifugal force developed by each rotor blade will work out to be in the neighborhood of 10,000 lb. or more. In those configurations requiring individually flapping blades, a bearing must be used on each blade, which can carry this heavy load. Such bearings are available. However, in action, the bearing oscillates through about only 3 deg. The result is that a very small area of the bearing is actually used and service life is discouragingly short. Furthermore, these bearings must be free and retain identical friction characteristics. The problem of this bearing cannot be minimized; a completely satisfactory solution has not been found in a hinged type rotor.

The problem does not arise in the Domen rotor because the gimbal mounting of the rotor hub makes the flapping hinge unnecessary.

• **Coriolis Effect**—With a rotor using a flapping hinge, the 'copter in forward flight will have the blades rising to a high point over the back of the craft. Were it a four bladed helicopter the appearance would be as shown in the accompanying sketch, at the instant one blade is closest to the observer. The fourth blade is not seen because it lies directly behind the blade designated *A*.

It is to be noted that the axes of the flapping hinges remain horizontal. This being the case, the only way blade A can manage to get into the position shown (and this is the position it must be in to be in dynamic balance) is for the blade shank to bend as indicated in the diagram. The forces that tend to bring blade A to this bent position are very large since they arise from the great momentum of the blade which tends to keep it moving at constant angular velocity relative to the tip path plane.

This condition is true on a flapping hinged or see-saw type rotor of any number of blades, but is most easily shown on a four bladed system. This periodic bending of the blade shanks is so destructive that the rotor blades would soon come adrift if remedial measures were not taken. The forces involved are so great that they cannot be safely carried by simply strengthening the blade.

It would seem that a 'copter with a universally mounted hub such as embodied the Doman rotor might be without the coriolis problem because the rotor hub will incline and remain parallel to the tip path plane, so that bending of the blade shanks is not necessary. Actually, the coriolis condition also exists in the form of a universal joint problem. The greater the angle through which a universal joint is required to operate, the more uneven will be the motion of the driven member. On a 'copter with a gimbal mounted hub, periodic acceleration and deceleration of the blades from this universal joint effect will cause stresses of intensity similar to those encountered in a flapping hinge type, as a result of coriolis.

To overcome this condition, some users of the gimbal mounted hub em-

ploy a rotor mast which is very flexible torsionally. Periodic rotor accelerations on the head are thus absorbed by torque wind-up of the rotor shaft. This scheme seems to have the objectionable feature of taking the vibratory stresses from one point of the aircraft only to apply them to some other point.

The solution employed on the Doman rotor is unique and completely does away with the vibratory stresses. A constant velocity universal joint is employed as the driving attachment of the rotor mast to the rotor hub. The entire rotor head is free to tilt to handle any condition of forward speed or C.G. movement of the fuselage and yet remain in perfect dynamic balance. The use of a constant velocity joint at this point is considered to be a major contribution to the helicopter art. Its effect in reducing blade stressing has been most gratifying.

Because a constant velocity joint cannot be designed to take thrust, a double universal joint arrangement is used. It is shown in the accompanying schematic sketch of the rotor mechanism, that the gimbal ring type universal joint carries the thrust load. The torque to rotate the head is supplied through the constant velocity joint. Both joints have a common tilting center.

(Further discussion of rotor design problems will be presented in the next issue.)

Information Tips

Data on Radiography

Designers, engineers, production men, and inspectors concerned with aviation materials will be interested in new 16-page illustrated catalogue, issued by **Eastman Kodak Co., X-Ray Div.,** Rochester 4, N. Y., listing materials and accessories for industrial radiography. Included is information on films, exposure holders, intensifying screens, chemical preparations for processing, darkroom accessories and viewers. Chart indicates relative speed and contrast of different types of x-ray films for computing exposure.

Aviation Accessories

Scott Aviation Corp., Lancaster, N. Y., announces new folder listing entire line of aviation accessories for 1948. Included are details on tail wheels, engine instruments, and fuel gages.

Antenna for Static Reduction

Eight page booklet on reduction of precipitation static in aircraft radios is offered by **Dayton Aircraft Products Inc.,** 342 Xenia, Dayton, Ohio. Publication goes into considerable detail on causes for precipitation static, describes methods developed by U. S. Air Forces for its reduction. Antenna system described is stated to provide greater assurance against breakage under icing conditions, and, if desired, reproduction of U.S.A.F. technical order covering installation of equipment on army planes will be furnished.

Welding Equipment, Hints

For production personnel, **Tweco Products Co.,** Wichita 1, Kan., issues new 12-page catalog describing line of welding electrode holders, ground clamps, cable connections and splicers, machine terminals, lugs, and carbon holders. Bulletin CC-47 "Causes and Cures for Hot Running Welding Cables and Connections" is also issued to offer helpful hints to every day problems.

NEW AVIATION PRODUCTS

Gages CO Concentration

Adaptable for surveys of aircraft interiors and test cells, new portable carbon monoxide tester is announced by **Mine Safety Appliance Co.**, Pittsburgh 8, Pa. Utilizing indicator tubes developed by National Bureau of Standards, tester is capable of revealing presence of carbon monoxide from 0.001 to 0.10 percent by volume in air. Nucleus of instrument is detector tube containing yellow silica gel, impregnated with complex silico-molybdate compound and catalyzed via palladium sulfate. Sealed ends of tube are broken in tube-breaker and tube inserted in instrument tube-holder. Sample of air is aspirated through tube by squeezing bulb, and if sample contains CO, yellow indicating chemical turns varying shades of green, directly proportional to concentration. Degree of gel discoloration is then compared with integral revolving color scale for quick reading.

Socket Set Improved

For aircraft factory and repair base usage, redesigned ⅜-in. drive line of sockets and handles conforming to shape of hand is announced by **Snap-on Tools Corp.**, Kenosha, Wis. Known as Snap-on Ferret Set, four sockets have been added to give size coverage between ¼ and ⅞ in. Units have four indentations on inside of drive hole to make easy engagement with ball in handle of driver. Improved size markings are for easier selection.

Radio Frequency Generator

For high production induction heating jobs such as hardening gears or progressive and selective shaft hardening, 50-kw., 450-kc. RF generator and matching two-position work table is offered by **Westinghouse Industrial Electronics Div.**, plant 4, Baltimore 3, Md. Generator is assembled to include all control equipment, high voltage rectifiers, protective devices, oscillator tubes, RF tank, and coupling circuits in complete unit. Outstanding features are lightweight aluminum cabinet, complete RF shielding to insure compliance with FCC radiation requirements, stepless power output control by grid control rectifier, filtered air for easier maintenance, circuits fully protected from overloads, and large 6-in. meters providing easy reading. Work table has stainless steel sink and complete fittings for two station operation. Multiple mounting bosses are provided on sink for easy installation of work-handling equipment. Table has dual fittings for quench and cooling water and two sets of heavy duty RF output terminals. Weighing approximately 7,000 lb., generator measures 144 × 60 × 84 in. high and operates on 230/460v., 3-phase, 60c. current.

Makes Battery Water

Of interest to small airport operators is new water demineralizer designed to prepare battery water from ordinary raw water high in mineral content. Stated as functioning to make tap water chemically equivalent to distilled water, flow from faucet enters at bottom and works up through series of four beds of synthetic plastic-like materials known as ion exchange resins. In first bed, water is acidified; in next and subsequent beds, neutralized and absorbed. Substances removed are claimed to include sodium, potassium, calcium, magnesium, iron, copper, and lead; salts removed: sulphates, carbonates, and chlorides. Made by **Penfield Mfg. Co.**, Meriden, Conn., unit consists of wall bracket, renewable resin cartridge, and electrical resistance indicator to show when new cartridge is needed. Cost of demineralized water is represented as few cents per hundred gallons.

Aircraft Voltage Regulator

Intended to provide controlled voltage for electrically heated aircraft windshields, voltage regulator is offered by **Westinghouse Electrical Corp., Aviation Div.**, Lima, Ohio, to handle 11 kva., 3-phase, 208/120v., 4,000-8,000-rpm. alternator. Panel is arranged with plug connector for ease of installation on shock mount in craft, and all maintenance, testing, and adjustment can be performed at service bench. Unit weighs slightly over 6½ lb.

Information Tips

Fabrics, Finishes, Plastics

Utilization of Nylon, finishes, and plastics in various phases of aviation industry are outlined in articles in duPont Magazine, Vol. 41 No. 5, published by **E. I. duPont deNemours & Co.**, Wilmington, Del. "Nylon Takes to Air" points out important characteristics of fabric as air safety device. Primers, enamels, lacquers, and other coatings are explained in "Flying Finishes." And duPont "Airborne Plastics" tells of mounting importance of these materials in aviation.

Electrical Developments

Of general and specific interest to engineers in the aviation industry is comprehensive annual review titled "Electrical and Allied Developments of 1947," scheduled for publication this month by **General Electric Co.**, Schenectady, N. Y. Included are data on phases of transportation, research, testing and measuring, electronics, power, industrial equipment, illumination, air conditioning, appliances, and other subjects.

Cutting Fluid Data

"Cutting Fluids for Better Machining," is 72-page pocket-size catalogue of metal-working information offered by **D. A. Stuart Oil Co.**, 2727 South Troy St., Chicago 23, Ill. Revised to keep pace with latest metal cutting developments, booklet contains much data on application of company's oils for cutting, grinding, drawing, quenching, and tempering, also other phases of metalworking and industrial lubrication. Included are sections on metal cutting mechanisms, selection of cutting fluids, rules for prolonging tool life, handy tables of standard steel specifications, independent research committee data, and marking system chart for grinding wheels.

For Balance-Weight Applications

"Hevimet"—alloy of tungsten, copper, and nickel—is now being marketed by **General Electric Co., Metallurgy Div.**, Pittsfield, Mass. Originally developed as high density product for use on gamma ray screen, this sintered material is represented as adaptable to construction of balance weights for eliminating vibration in crankshafts, propellers, and other rotating parts. Possessing density 50 percent greater than lead, alloy is stated to have great tensile strength with good machinability, high resistance to atmospheric salt water corrosion, and to be easily plated with cadmium, chromium, or nickel. Silver soldering or brazing may be applied by standard methods. Forms are variety of nonporous sheets and blocks, and complex shapes may be built up from simple pressing by special process of hydrogen welding. Average product has density from 16.8 to 17 grams per cu. cm., tensile strength of 85,000 to 118,000 psi., and Rockwell hardness of 30 to 40 C scale.

Radio Compasses Available

Immediate delivery through stepped-up production facilities of ARC-10 automatic radio compass is announced by **Lear, Inc.**, 110 Ionia Ave. N. W., Grand Rapids 2, Mich. Unit can be supplied with special kit, without extra charge for installation in light aircraft, including special dust cover and dress panel so as to fit tuner unit into glove compartments of nearly all lightplanes. Special mounting brackets are also supplied.

Four Point Program Offered To Boost U. S. Civil Aviation

President's Air Policy Commission urges that steps be taken to bolster the airport program, fixed base operations and personal flying.

By ALEXANDER McSURELY

Four major recommendations of the President's Air Policy Commission Report relating to personal planes and civil airport operations offer prospect of major benefit to these phases of U. S. aviation if action implementing the recommendations is forthcoming from government.

The recommendations:

• **Military services** should weigh carefully savings possible through contract overhaul of military aircraft by civilian shops, and longterm advantages of building up civilian staffs trained in such work for use in an emergency.

• **Personal aircraft manufacturers** should take primary responsibility for compliance with aircraft design standards, promulgated by the federal government. Present CAA testing of new design personal planes should be conducted and "sworn to" by the manufacturers after they have been certificated by the Department of Commerce, as competent responsible producers.

• **Advisory panel** of representatives of state and municipal aviation groups should be named to work with the Air Coordinating Committee, giving local aviation interests a voice in national air policy issues, and a means of working more closely with federal departments and agencies.

• **Congress should appropriate** each year the full amount permissible under the Federal Airport Act (maximum $100,000,000 a year) for aid in building new airports and improving old ones.

Disappointment is being expressed within the industry about scanty recommendations for federal sponsorship of research to develop improved personal planes.

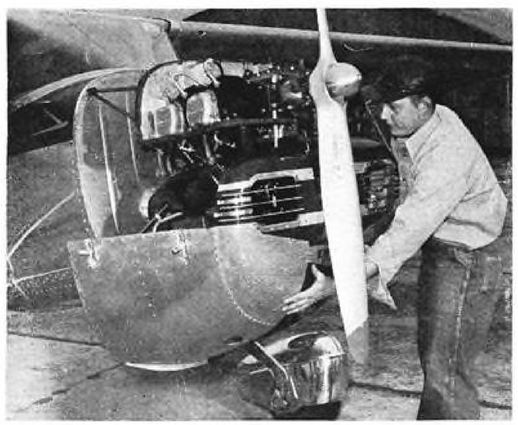
The report slides neatly around this somewhat controversial issue, by a mild statement that "another way in which government may properly encourage the development of aircraft suitable for private use (in addition to airport development) is by the NACA continuing some research directly applicable to small aircraft."

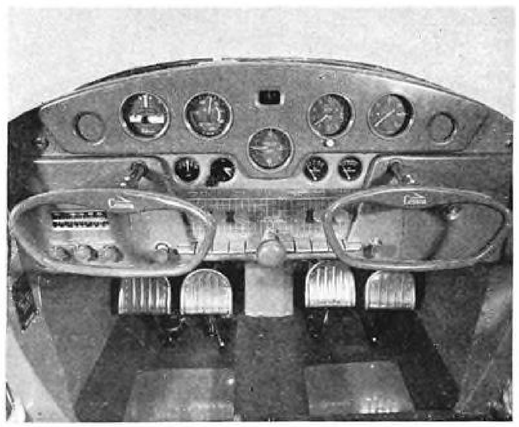
The report suggests further research on boundary layer control "would appear to be useful" and calls for studies exploring unconventional aircraft configurations such as "combining the principles of the helicopter and fixed wing airplane." NACA effort in these areas should be limited strictly to basic research, and not applied to development of any commercial article, the Commission recommends.

▶ **Cold Comfort**—The report likewise gives cold comfort to personal plane manufacturers looking toward military contracts, stating: "The military services cannot offer much in the way of direct financial assistance to the individual experimenter who may have a new idea for the development of a new type of personal aircraft." It does suggest "loans" of surplus or obsolete equipment (engines, instruments, propellers, etc.) "whenever occasion offers" with proviso that the services be given first information on any new developments which may result.

Commission indicates that the armed services expect value of personal aviation in future national emergencies will be materially less than it was in World War II.

"According to evidence submitted to the Commission, civilian instructors are unlikely to be required for any emergency within the next 15 years because of the availability of World War II pilots. This 15 year availability of World War II pilots for instructor, patrol, and transport duties, ensures





1948 CESSNA ENGINE AND PANEL

First photo of the new 90 hp. Continental engine installed as standard equipment in the two-place 1948 Cessna Model 140 shows quick accessibility of the C-90 installation. Improved instrument panel of the 1948 Model 140 has less glare than before. Throttle is moved up, making more knee room, while new type labels designate controls more clearly. Current price of Model 140 is unchanged from 1947 model at $3,345 flyaway Wichita, despite the increase in horsepower from 85 in last year's model. The two-place Model 120 continues with 85 hp. engine at an unchanged price of $2,845 flyaway Wichita.

personnel for these three important emergency functions which were largely performed by private pilots in the early years of World War II."

▶ **Pilot Problem**—This statement completely ignores the fact that many World War II pilots who would be readily available for any of these "three important emergency functions" within the next fifteen years would be World War II pilots who are continuing in civilian aviation. Unless civil aviation enjoys a reasonable health and provides opportunity for these men and for other World War II pilots to fly either for business or for pleasure, the pilot reservoir may well be much less valuable in emergency than is indicated.

The report gives credit to personal aviation for its value in World War II pointing out the usefulness of pilots and mechanics drawn from personal aviation; the use of civil airports and ground facilities; the value of the civilian pilot training program; the worth of converted lightplane types as liaison and light transport types; and the contribution of private flyers as members of CAP.

▶ **Taxpayers Contribution**—The Commission points out past "generous contributions" by the taxpayer to personal aviation, including government-sponsored CPTP, war production contracts to personal plane manufacturers, airport improvements during the war, and the VA flight instruction program under the GI bill of rights.

Pointing out that hundreds of thousands of military and civil pilots now "compose the largest ready made market for personal planes and airport facilities that has ever existed" the report says that this group will determine the near future of personal aviation, and that if they fail to continue flying, their neglect should be "an unmistakable sign to airplane designers that a new airplane is needed which will provide more utility at a lower operating cost."

The Commission states that a healthy personal plane industry "is of value to the Nation" and "should be encouraged, by continuation of funds for airports, for navigation and landing facilities and for basic improvements in personal plane design." "We believe that the appropriations to personal aviation for these purposes plus the very substantial financial assistance provided for veterans' flight training, is sufficient," the report concludes.

Port Authority Cites Fields In Annual Statement

Assurance that New York's International Airport will open at Idlewild next July came from Howard S. Cullman, chairman of the Port of New York Authority, in his annual report to the New York board of commissioners. Cullman said that two huge all-purpose hangars now under construction will be ready early in 1949 to augment the two hangars now at the airport and provide necessary base facilities.

Reason for Port Authority abandonment of negotiations with the Navy for civil aircraft use of Floyd Bennett field also was outlined by Cullman in the report.

"The improvements demanded by the Navy as its price for relinquishing the field steadily increased in quantity, quality, and estimated cost, ranging from $367,000 in the fall of 1946 . . . to $1,250,000 at the conclusion of their negotiations with the Port Authority," the report said. "The Navy insisted on a 'gold plated' improvement program as its price for relinquishing the airport and regretfully we were forced to abandon our efforts to use Floyd Bennett to alleviate the growing congestion on the ground and in the air at LaGuardia."

The imminent Army release of properties it holds under wartime lease from the City of Newark (N. J.) will put into operation a 50 year lease agreement between the City of Newark and the New York Port Authority covering Newark Airport.

Meanwhile reports of Port Authority interest in Teterboro Air Terminal, important air cargo gateway to New York, hint at the possibility of a move to integrate the field into the LaGuardia-Newark-Idlewild chain. The matter has not yet reached the negotiation stage between the Authority and Teterboro management.

Piper to Close Ponca City Branch

Closing of the Piper Aircraft Corp. branch assembly plant at Ponca City, Okla., is expected soon after Feb. 1. according to word received by the Ponca City Chamber of Commerce. W. T. Piper, Sr., president, indicated that he expected the Piper board of directors to vote to close the plant and that there was little hope of its reopening due to the present status of the small plane market.

The Ponca City plant is now employing approximately 80 persons, assembling planes from parts made at the main Lock Haven, Pa., Piper plant. The Lock Haven plant will still continue in operation.

At one time last year, the Ponca City plant was employing more than 300 persons and was turning out from 45 to 50 planes a day. Piper officials estimated they had paid out from $500,000 to $600,000 in salaries, and approximately $150,000 for plant improvements at the assembly plant which is located in Ponca City.

Whearty Is Newly Appointed Kansas Aviation Director

Riley R. Whearty, Topeka, wartime Air Force lieutenant colonel, has been appointed aviation director of the Kansas Industrial Development Commission, succeeding S. F. Robertson, Hutchinson. The aviation director's post was established by the Kansas legislature last year.

Personal Plane Forecast

Prediction that dollar value of personal aircraft production and sales in 1948 will probably equal that in 1947 although only one half as many airplanes will be sold was made to AVIATION WEEK by William A. Blees, Consolidated Vultee Aircraft Corp. vice president, in charge of sales.

Lightplane manufacturers probably will gross between $38,000,000 and $40,000,000 with dealers showing gross return on total estimated sale for 8,000 airplanes of $50,000,000, the Convair sales chief forecasts, basing his prediction on findings of his recent national sales promotion tour for Convair's Stinson division.

He believes final recapitulation of 1947 lightplane business will show the production and sale of 15,800 units.

Two things probably will influence, according to his estimates, a 50 percent decline in unit volume in 1948: I.—Market saturation by 1947 production and heavy losses incurred by a high majority of all lightplane manufacturers; and, II.—The trend away from production of high volume manufacture of two-place small aircraft and toward production of the four passenger airplane for personal use.

Blees said that in 1947 the only two airplane manufacturers (including makers of big planes as well as of personal aircraft) to make a profit were Convair's Stinson division and Grumman.

He would not disclose Stinson's net profit for 1947, but did say that during the fiscal year ending Dec. 1, Stinson division produced 2,714 of its four passenger "Voyager" personal planes for $12,000,000 factory gross return and $16,000,000 gross return to dealers.

$3,000,000 Asked

Wisconsin State Aeronautics Commission will ask the 1949 state legislature for $3,000,000 to match federal funds in aids to local airports, Thomas K. Jordan, executive secretary, announced at a recent meeting with a committee of the legislative council. The commission also may ask the legislature for a deficiency appropriation for Jan. 1 to June 30, 1949, for financing vital projects which could not be postponed.

The commission also will ask that the director's salary be increased from $5,000 to $7,500 a year, and that existing laws governing aeronautics be clarified to conform with federal laws.

Floatplane Rescue

An overturned Luscombe 8-E float plane, kept a Vancouver, B. C., pilot and his passenger afloat for nearly seven hours before they were rescued by a passing trapper, in Bute Inlet on the B. C. coast recently. Pilot W. B. Sylvester and passenger Donald Houle of Port Alberni clung to the Edo floats of the overturned plane and burned paper money, including several $10 bills and other paper and bits of clothing, as a beacon until they were able to attract the trapper's boat. Sylvester said he had turned into a 20 mi. wind at full throttle for his takeoff from the inlet when a sudden gust of wind turned the plane on its back.

Parachutes at All Times

Old controversy over whether airplane passengers and pilots should wear parachutes is renewed in New York State with introduction of a bill in the state legislature at Albany recently, to require wearing of parachutes by persons in aircraft at all times during flight within the boundaries of this state. The bill has been referred to the judiciary committee, would have a far-reaching effect on charter services, nonscheduled operations, airlines and private flyers as well, and would presumably cause a boom in the parachute industry also if it were enacted.

4,000th Stinson

Sale of the 4,000th postwar Stinson Voyager, reported recently, gives the Stinson division of Consolidated Vultee Aircraft Corp. the total volume of more than half of all four-place planes sold postwar, with dollar volume totalling more than $24,000,000. Hugh V. Tull, Plainview, Tex., industrial machinery dealer, bought the plane, which he uses to commute between his branches at Plainview, Abilene, Odessa, and Amarillo. Claude Hutcherson, Plainview Stinson dealer, made the sale.

BRIEFING FOR DEALERS & DISTRIBUTORS

DC-4 CONVERSION KITS—Perhaps a new high in stocking of parts for one airplane by any one firm has been reached by Industrial Associates, 375 S. Robertson Blvd., Beverly Hills, Calif., which has recently acquired through surplus purchases more than 10 standardized kits for converting military Douglas DC-4s to commercial standards. Conversion kits are complete except for seats, rugs and buffets which are not standardized. Company now has a Douglas inventory in excess of 3,200 parts numbers, and also stock parts for Lockheed, Pratt & Whitney, Wright, Ranger, Warner, Scintilla, Eclipse, Thompson, Resco and Purolator aviation equipment. Frederick C. May and Bernard F. Gira, partners in Industrial Associates, both were associated with Douglas during the war years. Prospect for immediate market for the kits prompted their venture into the big plane modification kit field.

FLORIDA AIRCRAFT REGISTRATIONS—A new Florida law, effective Jan. 1, requires that all aircraft owned by Florida residents and operated regularly in the state must have Florida aircraft registration certificates in lieu of personal property taxes on planes. Planes are registered through state motor vehicle commissioner with fees for private aircraft ranging from $5 for planes of 2,000 lb. gross wt. or less, to $25 for planes of 4,500 lb. gross or more. Aircraft for hire are licensed at $1 per 100 lb. up to maximum of $100 for planes weighing 6,000 lb. or more. An additional 25 cent service charge is made on each registration. Funds from registration fees go to Florida State Improvement Commission, 50 percent of which are to be spent on state aviation projects. Remainder is distributed to counties.

65 HP. LUSCOMBE CONTINUES—Luscombe Airplane Corp., Dallas, advises that it is continuing to produce its 65 hp. two-place Silvaire Standard, all-metal plane selling for $2,495 flyaway, and a 65 hp. Silvaire Special at $2,695. These, with four 85 hp. two-placers tagged at $2,995 and $3,595, give the company an eight model two-place line with what the company believes are the lowest priced all-metal two-placers in the 65, 85 and 90 hp. categories.

ASKS WAITING PERIOD—Roy L. Wood, vice president and general manager of S. A. Long, Inc., Wichita, reports that his company has received government orders to scrap approximately two-thirds of its WAA agency stock of surplus aircraft parts, originally valued at $18,000,000, by June 30, date of expiration of the life of War Assets Administration. Wood urges that a one to three year additional period should be allowed by Congress in order to be sure that the materials to be junked won't be urgently needed later in view of world conditions.

SEARCH AND RESCUE—Oregon State Board of Aeronautics is establishing a coordinated search and rescue system for planes reported missing in the state, using funds from state registration fees of pilots. State highway department, state police, state and national forestry services, sheriffs, Army and Navy planes, CAP, Coast Guard, CAA, flight operators, Red Cross medical units, newspapers and radio stations are all tied into the plan which divides the state into air and ground zones with a director for each zone. Under the plan search by air will be made as far out to sea as it is reasonably safe to fly.

SERVICE BY SNYDER—Snyder Aircraft Corp., Chicago Municipal Airport, has issued an attractive folder describing the completeness of service offered in the new Snyder hangar and shops to transient flyers using Chicago Municipal Airport. Free station wagon service to the nearest taxi or bus terminal, cleaning windshields and interior of ship, and immediate line inspection of the incoming plane to determine any extra service that might be needed, are provided. Hangar storage or tie-down is made available along with washing, polishing and accessory overhauls, as well as regular line servicing with gas and oil. The folder is being mailed to all transient flyers who use Chicago Municipal Airport.

SKYWAY ONE TERMINAL—Grand Central Air Terminal, Glendale, Calif., is bidding for recognition as the western terminal of the Skyway One airmarking transcontinental route for private flyers. Proximity of the field to downtown Los Angeles and Glendale, and extensive use of Los Angeles Municipal and Lockheed Air Terminal by scheduled airlines, is pointed out by Grand Central as reasons why the Skyway One aerial tourist should make his western base at the Glendale Field.

—ALEXANDER McSURELY

Nominal Security Quotations Reflect Plight of Non-scheds

Inability to estimate capital necessary to survive is cited as one reason many non-certificated carriers have had to leave the industry.

A major phase of the air transport industry—the non-certificated lines—is experiencing its own particular financial difficulties at the present time. This is reflected in what almost amounts to nominal quotations for the securities of these companies.

It is possible that the plight of this segment of the industry has not received wider public notice due to the relatively limited marketability its securities.

Without exception, the securities of the publicly-held non-certificated carriers are traded in what is known as "over-the-counter" or unlisted markets. It is only after companies have become adequately "seasoned" with a record of sustained earnings and established operations that their securities "graduate" to the listed exchanges such as the New York Curb Exchange and the New York Stock Exchange. Yet, many a company with a very humble beginning whose securities received their first financial support in the unlisted markets is actively trading on the "big board"—the N. Y. Stock Exchange. For example, the equities of such companies as Pan American Airways and American Airlines were first available in the "over-the-counter" markets. In these instances, substantial profits, many times the original investment, were realized. It is this hope of making a financial killing by getting in on the ground floor that leads many investors and speculators to take risks in "unseasoned" securities of new enterprises. All too frequently, however, the risk factor is just as high if not higher than the profit potentiality. As a result, it is not uncommon for heavy losses to be incurred in commitments of this type.

▶ **Loss Pattern Consistent**—The loss pattern has been a consistent one among the securities publicly marketed by the non-certificated carriers. In no one instance does a single equity in this category currently command a higher market price than when first sold publicly. The accompanying table reveals this historical record.

Most of these shares were sold in the spring of 1945 and during the first half of 1946. The market atmosphere was very favorable for such sales. In the first place, aviation had wide popular appeal and effective salesmanship had little resistance to overcome in placing shares of these new companies. One banker even testified in a proceeding before the Civil Aeronautics Board that all that was necessary to sell these issues was to place the word "airline" in the corporate name of the company. There was little effort made by the investing public to discern the fine distinctions existing among these companies.

▶ **Few Survive, Others Fold**—As with all speculative stock flotations, a few benefit the investing public and survive, the others have their brief flurries and fold up in due time.

The indicated bid prices for the equities of most of these companies are a manifestation of the public's current appraisal of the doubtful ultimate survival of many of these units.

One company, Airborne Cargo Lines, has completed its corporate existence in the bankruptcy courts. Launched as Hoosier Air Freight Corp., this company subsequently changed its name to Airborne early in 1947. At that time Airborne's president stated that a "modest profit" was expected in 1947.

Expresso Aero Inter-Americano, through one of its officials, recently indicated that it was having a serious financial problem and was in need of considerable assistance. This company's stock has had a spectacular history. Under the sponsorship of Van Alstyne, Noel & Co., 300,000 shares were sold in May, 1945, at $3 per share and within a very short period were quoted around $10 per share. All this was done without any record of past earnings on the part of the company. Current quotations are around 60 cents a share.

▶ **Taca Cited**—Another interesting situation concerns itself with the earlier financing of Taca. To augment its huge expansion program, 500,000 shares of common stock were sold at $15.50. Shortly thereafter, these shares were quoted at around $25—all without any benefit of profitable earnings. The current market bid is around $1.75 per share.

It is fair to note, however, that the management complexion at present is completely changed and has very little relationship to its immediate past. Early last year, the Waterman Steamship interests assumed a dominant role in the management of the company and has been reported as instituting various reforms. Among other things, highly respected Paul Richter was subsequently installed as president and chief executive officer.

With the entrance of the Waterman interests there were a number of major financial changes. To provide additional capital, $1 million in new 4 percent convertible notes were sold. Of this amount, Waterman took $500,000, Pennroad Corp. $250,000 and others the balance. Various options on stock were also granted Waterman.

Probably the most important unit and the company capable of demonstrating recent profitability in the non-certificated group does not appear in the accompanying table. This is Slick Air and it is largely privately financed. More than $1 million debentures have been placed privately with certain investors.

There are many reasons why most of the non-certificated companies have floundered. Certainly, a good deal of under-estimation of the capital requirements necessary to survive is evident.

—Selig Altschul

Market History

Non-certificated Air Carriers
Traded In Unlisted Markets

Date Sold	Company	Shares Offered	Price to Public per Share	Current Bid Price per Share
Feb., 1946	Airborne Cargo Lines	170,000	$1.75	nil
Nov., 1945	Air Cargo Transport	300,000	3.00	$0.50
May, 1945	Expresso Aero Inter-Americano	300,000	3.00	0.60
April, 1946	Flamingo Air	135,000	2.00	0.375
May, 1946	Island Air Ferries	95,000	3.00	1.50
March, 1946	Latin American Air	99,166	3.00	0.25
June, 1946	Long Island Airlines	99,500	3.00	0.05
April, 1946	Flying Tiger Line	500,000	5.00	0.50
May, 1946	Taca, S. A.	500,000	15.50	1.75
April, 1946	Trans-Caribbean Air	99,000	3.00	0.50
June, 1946	U. S. Airlines, Inc.	900,000	3.25	0.375

Certificated Lines Ask Monopoly On U. S. Governmental Air Travel

Air Transport Association opposes Air Force proposal which would permit uncertificated operators to participate in trans-Pacific movement of dependents.

By CHARLES ADAMS

A basic question of government policy toward certificated and uncertificated airlines has developed as the result of efforts by military officials to arrange trans-Pacific air transportation for about 2,000 dependents of Army personnel.

The Air Force proposed dividing the traffic among the two U. S. flag carriers flying the Pacific—Pan American Airways and Northwest Airlines—and two major uncertificated operators—Pacific Overseas Airlines and Transocean Air Lines. Admiral Emory S. Land, president of the Air Transport Association, has informed W. Stuart Symington, Secretary of the Air Force, that "any determination of policy by the Air Force which would deprive the certificated carriers of needed traffic moving over their routes is contrary to the national interest."

▶ **New Policy Urged**—ATA urged the government to establish a policy of employing certificated carriers to perform needed government transportation "in every instance where the facilities of the certificated carriers are adequate to perform the service." The airline group asked that the government cease its practice of employing noncertificated carriers for this purpose.

The Air Force recently called a meeting of the four carriers to outline its requirements for transporting 500 passengers a month from the West Coast to Tokyo, Okinawa, Manila and Guam over a four-month period. It was also requested that the air carriers quote a rate per person for the transportation.

▶ **Fares Listed**—Pan American and Northwest currently charge $650 for a one-way trip from West Coast points (Los Angeles, San Francisco and Seattle) to Tokyo. Transocean and Pacific Overseas point out that a 10 percent tariff reduction would enable the government to save $130,000 on the movement of 2,000 passengers.

The two certificated carriers attacked the suggestion that they establish special low fares for the Army business. They said it might be discriminatory and a violation of the Civil Aeronautics Act.

▶ **Viewpoint Given**—Admiral Land told Secretary Symington he did not concede that the proposed trans-Pacific transportation could be conducted legally by the uncertificated carriers on a contract basis. He also pointed out that uncertificated carriers are definitely barred from common carriage of passengers to foreign points.

ATA said the Air Force's determination to arrange for less-expensive air transportation conflicts directly with the government's prior action in certificating Pan American and Northwest to the Orient. "Carried to its logical conclusion, it will go far to thwart the purpose of such certifications generally."

▶ **Double Charge Seen**—"It must be recognized that if the Air Force gives half of this proposed movement to the noncertificated carriers involved, the government will in effect be paying twice for this transportation. For some time both [PAA and NWA] will require financial support from the government through mail pay. The Air Force now proposes to employ noncertificated carriers to transport a large block of traffic, thus depriving the certificated lines of revenues which otherwise would contribute to their total revenues, and would reduce the financial support which the government will otherwise be called on to pay."

Land claimed that uncertificated carriers operate under "very limited and general safety regulations which do not match in severity the regulations applicable to certificated lines." He added, however, that he did not intend to assert that Pacific Overseas and Transocean conduct unsafe operations.

▶ **Impressive Records**—Both Pacific Overseas and Transocean built up impressive records in serving the armed forces on a contract basis during 1946 and the early part of 1947. In addition to flights for the Air Transport Command, both POA and TAL have conducted extensive contract services for various United States government agencies.

Pacific Overseas performed practically all the overseas air carriage in the Pacific for UNRRA, and Transocean is now engaged in transporting about 740 passengers monthly from the West Coast to Guam and Okinawa for essential national defense construction on those islands. They point out that the requirements of these services were more than could be met by existing schedules of the certificated carriers and that the operations were effected at a substantial saving to the government.

▶ **Defense Aid**—In both military and commercial contract operations Pacific Overseas and Transocean have flown a combined total of 207,600,000 passenger miles without passenger or crew injury or fatality. The two uncertificated lines contend it is in the best interest of national defense for the government to continue to use air carriers which, by

COMMERCIAL FIDO LANDING

Photo shows Southwest Airways DC-3 making first commercial FIDO landing at Arcata (Calif.) Landing Aids Experiment Station. Visibility before FIDO burn was ¼-mi. After burn was ¾-mi. plus. Ceiling before burn was 75 ft.; 300 ft. plus after burn. Fuel cost of burn was $51.76 for 647 gal. diesel oil at $0.80/gal. On that day, despite terminal weather conditions, SWA completed all Arcata schedules; made two FIDO landings and three FIDO takeoffs. Assisting landing aids used were radio range, compass locators, SCS-51, GCA, approach and runway high intensity lights. Landing was made in December, 1947. FIDO burn costs at Arcata now range from $24 to a maximum of $135.

their very nature, can meet unusual and emergency requirements.

It is understood that neither Pacific Overseas nor Transocean is opposed to sharing the traffic involved in the Army movement with Northwest and PAA. But both uncertificated lines believe that NWA and PAA do not have space available to handle the entire job within the specified four months.

► **Extra Sections**—To handle the traffic, both Pan American and Northwest reportedly would have to add extra sections to their regular flights. It is pointed out that no mail compensation would be granted for such special sections, and thus the government would not be paying twice for its transportation by patronizing contract carriers.

Some observers contend that PAA and Northwest actually would stand to profit by accepting only part of the traffic involved in the mass movement. They reason that the Army dependents could be used to maintain a high load factor on regular mail-carrying schedules. But if extra sections are flown to handle the surplus Army traffic, the return trips to the U. S. would probably be expensive deadheads.

Colonial to Receive Incentive Mail Pay

Colonial Airlines has accepted a CAB proposal which will give the carrier an estimated 5 percent profit on its Bermuda services through next month and which will make Colonial the first overseas operator to receive incentive mail pay.

For the period Aug. 1, 1947 (when Colonial began its Bermuda services), to Feb. 29, 1948, the carrier will receive total mail pay of $343,500, equal to 91 cents a plane mile. CAB estimates a 5 percent profit will result during the seven-month period.

► **Sliding Scale**—During the two-year development period Mar. 1, 1948, to Feb. 28, 1950, Colonial's Bermuda mail pay will be geared to its passenger load factor in accordance with an incentive rate formula already set up for Pioneer Air Lines and Continental Air Lines. When the carrier's passenger load factor on its 44-seat DC-4s is 55 percent, the mail rate will be 31 cents a plane mile.

For each one percent increase in the passenger load factor above 55 percent (up to 67 percent) the mail rate will decrease 1.75 cents a plane mile to a minimum of 10 cents a plane mile. For each one percent decrease in the passenger load factor below 55 percent (down to 43 percent) the mail rate will increase 1.75 cents a plane mile to a maximum of 52 cents a plane mile. Since revenue derived from a one percent increase in the passenger load factor is more than will be lost from a 1.75 cent decrease in mail pay, the carrier has every incentive to boost passenger volume.

WINTER OUTFITS

Stewardesses on Pan American's Alaska run between Seattle and Fairbanks have been outfitted with new fleece-lined boots, ski pants and parkas. Edith Fields (left) and Charlotte Halverson model the new outfits. The girls need uniforms when they stay over in Fairbanks or Juneau. The parka is made by the Jensen Manufacturing Co., Seattle.

► **Large Profit Possible**—If Colonial achieves its anticipated average 55 percent load factor during the year beginning Mar. 1, 1948, it will earn nearly 6 percent profit. A 70 percent load factor would yield around a 20 percent profit, while a load factor under 48 percent would result in a loss.

CAB said the sliding scale rate formula should minimize the need for frequent mail rate revisions attributable to uncertainties in predicting Colonial's passenger traffic. After Mar. 1, 1950, Colonial is to receive 75 cents a ton mile mail pay subject to a minimum capacity factor (false load) of 500 lb. on trips outbound from the U. S.

► **Traffic Gains**—Load factor on Colonial's routes from New York and Washington to Bermuda rose from 19.9 percent in August to 31.4 percent in September, 37.9 percent in October, 38 percent in November and an estimated 40 percent in December. In March and April, at the height of the tourist season, load factors are expected to jump to 74 and 83 percent, respectively.

Latin American Lines Apply for U. S. Links

Two more Latin American carriers, Aerovias Nacionales de Colombia (Avianca), Bogota, Colombia; and Aerovias Guest, Mexico City, have asked CAB for foreign air carrier permits covering new links to the U. S.

Avianca seeks to operate between Bogota and/or Barranquilla, Colombia, and New York via Jamaica, Havana and other points. The carrier already holds a foreign air carrier permit to fly between Colombia and the Canal Zone and between Colombia and Miami.

Aerovias Guest has applied for a link to New York and for authority to make Miami an intermediate stop on a proposed service from Mexico City to Lisbon, Madrid, Paris and London via Bermuda and the Azores. The line plans to use Constellations.

American Overseas Boosts Operations

American Overseas Airlines flew a total of 174,500,000 passenger miles averaging more than five trans-Atlantic crossings daily, in 1947, showing an increase in passengers carried of 82 percent over 1946, and an increase in cargo and mail covered of 62 percent.

Harold R. Harris, vice president and general manager, reported that AOA's total passenger volume for the year exceeded that of any other North Atlantic air carrier, U. S. or foreign. Passengers carried for the year totaled 63,570, while 2,860,000 lb. of cargo and mail were carried.

AOA added service to Reyjavik, Iceland; Glasgow, Scotland, and Helsinki, Finland, during 1947 bringing total number of foreign countries served to 11. As of Dec. 31, American Airlines System had completed 15,620 trans-Atlantic crossings, and on Nov. 21 hauled its 100,000th passenger, not including wartime military traffic, since inauguration of trans-Atlantic service in 1942.

At year's end AOA operated a fleet of seven Constellations and seven Douglases. In 1948 AOA expects to place in service one or more double-decker Boeing Stratocruisers of which eight are on order.

WAL Appoints James As Director of Safety

Western Air Lines has appointed C. N. James as director of safety, a new post created in accordance with recommendations made recently by President Truman's Special Air Safety Board.

In its final report issued this month (AVIATION WEEK, Jan. 12), the special board urged all airlines to name a full-time director of safety at a sufficiently high management level to enable proper observation, analysis and planning to achieve a higher degree of safety. James, who has been on leave of absence for the past six months because of illness, will report directly to WAL president T. C. Drinkwater.

Other personnel developments:

• **American**—John R. Wiley, formerly assistant to the vice president-operations, has been named to the newly-created post of director of the inventory control division.
• **BOAC**—Sir Harold Howitt, deputy chairman since May, 1943, is slated to retire Mar. 31. He will be replaced by Sir Miles Thomas.
• **Capital (PCA)**—J. O. Urquhart has been named manager of special events. He will be coordinator of all special flights and will attempt to expand PCA's charter operations.
• **Northeast** — Eugene Ostheimer, former passenger traffic manager for Chicago & Southern, has been appointed director of tariffs and schedules for Northeast Airlines.
• **Northwest**—E. B. Curry has become general superintendent of aircraft maintenance.
• **Pan American**—Rahland C. Zinn has been named division engineer for PAA's Latin American operations. He succeeds Joseph J. Dysart, who has been transferred to New York as division engineer of the Atlantic sector. . . . Paul T. Rennell has become superintendent of cargo agencies for the entire Pan American Airways system.
• **United**—John W. Newey, vice president-finance, has been granted six months' leave of absence to accept an assignment representing all the airlines in negotiations on joint airport matters on the Atlantic coast. . . . E. P. Lott has been named manager of flight dispatch in the eastern area.
• **West Coast**—Maurice Stacy has become assistant general sales manager.

CIO Wins Election

The American Communications Association (CIO) reports it has been chosen to represent TWA teletype operators, overseas flight radio officers and ground radio officers as the result of a recent National Mediation Board bargaining election. The Airlines Communications Employes Association (ACA affiliate) received 203 votes to 61 for the Skylines Association of Radio Operators, an independent union which has represented the employes for eight years.

Alaskan Cargo Exemption Hit

Certificated airlines criticize benefits for 'worst violators' of Civil Aeronautics Act.

Indication of whether the Civil Aeronautics Board—minus the influence of former Chairman James M. Landis—is still inclined to back liberal exemptions for all-cargo carriers is expected shortly.

CAB last week scheduled oral argument on a proposal to permit uncertificated lines to conduct scheduled common carrier freight service between continental U. S. and Alaska pending determination of their applications for certificates of public convenience and necessity. The contemplated new section 292.7 of CAB's Economic Regulations parallels a previously promulgated section 292.5, under which 11 freight lines already have gained interim common carrier privileges to serve non-Alaskan points.

► **Opposition Forms**—Pan American Airways and Northwest Airlines are leading the opposition to section 292.7. PAA told CAB that its contemplated action is illegal and intimated that the new regulation seeks to confer benefits on the very carriers which have, PAA claims, been among the worst violators of the Civil Aeronautics Act in the past.

Despite the fact that uncertificated operators on the Alaska-Pacific Northwest run are only permitted to fly on a "casual, occasional, infrequent and non-scheduled basis," certain of the carriers have in fact flown more than daily service on a scheduled basis in recent months, PAA declared. A Pan American brief said flights by uncertificated carriers between Alaska and the Seattle gateway numbered 195 in August, 1947; 151 in September, 148 in October, and 115 in November.

► **Violations Condoned**—"No one visiting Seattle could believe there are only two carriers certificated between Alaskan points and Seattle," PAA stated. "The natural impression gained is that scheduled [passenger and cargo] service is available from at least 10 airlines who operate openly on exactly the same basis as Pan American [and Northwest]."

PAA said the only reason CAB is considering section 292.7 is that the Civil Aeronautics Act has not been enforced with respect to transportation between the U. S. and Alaska. "And there are always those who will recommend the easy course of condoning a bad situation rather than the harder one of rectifying it."

► **Loss Cited**—Pan American indicated that illegal operations by uncertificated carriers accounted in part for its loss of over $1,000,000 on U. S.-Alaska service in the first 10 months of 1947. The certificated line said its load factor, including cargo, was less than 50 percent last year "with seats and cargo space going empty because traffic was being drained off by services which should not have been operating."

The uncertificated operators take advantage of a double standard of safety requirements, Pan American told CAB. "Illegal operators fly at higher gross loads, with lower fuel reserves, lower weather minimums, no required route checks for flight personnel, and with few requirements as to radio aids. All this makes a tremendous difference when transferred into costs."

► **Rate Wars**—"In addition, illegal operators engage in rate wars. Either they fly on no tariffs or they make no effort to comply with tariffs which they do file and publicize. Last summer, chaotic conditions resulted when Alaska Airlines reduced passenger fares far below compensatory rates."

Pan American said the proposed exemption for all-cargo carriers is uneconomical and unworkable, since 89 percent of the air cargo available on the Alaskan run is northbound. PAA added that the uncertificated carriers inevitably would be forced to carry passengers to make a profit despite CAB's proposed prohibition against such operations by lines receiving the cargo exemption.

► **Carriers Named**—Eleven companies certificated in Alaska and 13 uncertificated lines which flew six or more trips between Alaska and continental U. S. between Aug. 1, 1947, and Oct. 30, 1947, would be eligible for exemption under 292.7, Pan American said. The uncertificated lines are: Northern Airlines, Mt. McKinley Airways, Golden North Airlines, Trans-Alaskan Airlines, General Air Cargo, Arnold Air Service, Standard Air Cargo, Totem Air Service, Pearson-Alaska Airways, Pacific Alaska Express, Lavery Airways, Sourdough and Columbia Air Cargo.

Alaska Airlines (certificated within the territory) told CAB that proposed section 292.7 is one of the most constructive steps toward development of Alaska ever taken by a government agency. Also backing more air cargo service to Alaska were J. A. Krug, Secretary of the Interior; John Nicholas Brown, Assistant Secretary of the Navy; Ralph J. Rivers, Attorney General of Alaska, and a number of merchants within the territory. They cited the frequent maritime strikes and inadequate road and rail facilities as reasons for more air service.

► **New Traffic Seen**—In its brief to CAB, Alaska Airlines said it was convinced that substantial southbound cargo traffic (mostly fresh fish and crab) can be developed. The company said that in October, 1947, it flew 104,000 ton miles of southbound freight in addition to 317,000 ton miles of northbound cargo.

Pan American and Northwest have failed to develop cargo on their other routes where little competition exists, Alaska Airlines declared. "Their performance in Alaska is typical of their overall failure to appreciate the possibilities of air cargo.

"In August, 1947, Alaska Airlines carried more cargo on its contract and irregular common carrier operations between Alaska and the U. S. than was handled on the entire domestic system of Northwest Airlines in that month—and more than was carried on PAA's Alaskan, Pacific and Atlantic operations combined.

SHORTLINES

▶ **American**—Has announced a "Flagship Creditravel Plan" whereby a prospective air traveler may obtain quick loans for trips to Europe, Mexico, Canada and within the U. S. under an agreement with the Irving Trust Co., New York, and other banks in AA cities. Money may be obtained in as little as 24 hours for a complete package trip, including tours, hotels and incidentals.

▶ **BOAC**—Company's foreign air carrier permit has been amended by CAB to designate Washington, D. C., and New York as co-terminals with Baltimore on the Bermuda run.

▶ **Capital (PCA)**—Immediate use of ILS is contemplated following CAA's announcement that the carrier had been approved for the landing aid. Installation of necessary equipment on PCA planes has been completed, and flying personnel has received extensive training in the use of ILS.

▶ **Eastern**—A Constellation flying nonstop from Miami to New York attained what EAL officials believe to be the fastest speed ever made by a commercial airline. Carrying 55 passengers and a five-man crew, the craft made the flight in 2 hr. 41 min. 30 sec., reaching a top speed of 565 mph. and averaging 421 mph.

▶ **KLM**—Has completed its 100th roundtrip flight across the south-Atlantic from Amsterdam to Rio de Janeiro and Montevideo. Carrier has handled 6,200 passengers and 72¼ tons of freight and mail since starting the service Aug. 6, 1946.

▶ **Philippine Air Lines**—This month adjusted its fares from San Francisco to Shanghai and Hong Kong to conform with those of Pan American Airways. Action was in keeping with resolutions passed at the recent International Air Transport Association conference held in Rio de Janeiro which called for all of its member airlines to equalize their fares between common points of service.

▶ **Pioneer**—Has joined the growing list of carriers offering to provide passengers with hotel reservations at their destination. Reservations are made by notifying the ticket agent at the point of departure.

▶ **Robinson Airlines**—Carried 21,296 revenue passengers on its New York intrastate routes in 1947—nearly double the 1946 total. The Ithaca-based company has completed 33 months of scheduled operation.

▶ **Slick**—Flew 21,937,071 revenue ton miles of freight in 1947, compared to 11,198,594 in 1946, the company's first year of service. Overall average load factor last year was 79 percent. Carrier flew over 2,000,000 freight ton miles during each of the last four months of 1947: September 2,034,411, October 2,519,871, November 2,096,143, December 2,068,681. Number of employes is 470.

▶ **United**—Flew 1,872,764 ton miles of freight and express in December, up 20 percent over the same month in 1946. Airmail tonnage for the month was down 10 percent.

Domestic Carriers Go Deeper in Red

Badly crippled by the DC-6 grounding, the 16 domestic trunklines suffered one of the worst months in their financial history during November, with every one of the carriers operating in the red.

November's operating loss of about $5,675,000 brought the domestic airlines' deficit to more than $15,555,000 for the first 11 months of 1947. Operating loss for the 16 carriers in November, 1946—a month sharply affected by the TWA pilot strike—was about $4,665,000.

Overall domestic deficit for 1947 now seems certain to approach the $20,000,000 mark. Operating loss for 1946 was about $5,500,000.

United Air Lines and American Airlines, hardest hit by the DC-6 grounding, showed operating losses of $2,063,000 and $1,397,000, respectively, last November. Next highest losses for the month were: TWA $448,000, Northwest $343,000, Eastern and Delta $247,000, Western $231,000, National $175,000 and Braniff $110,000.

Passenger traffic during the late fall continued to fall behind the same 1946 period. Revenue passenger miles flown by the 16 domestic trunklines in November, 1947, aggregated about 427,686,000 against 466,775,000 in November, 1946.

CAB SCHEDULE

Jan. 27. Hearing on TACA, S. A., foreign air carrier permit renewal and amendment case. (Dockets 3016 and 3017.)

Jan. 28. Hearing on requests of Braniff and Chicago & Southern for removal of restrictions on Chicago-Houston service. (Docket 1681 et al.)

Feb. 2. Hearing on Board's investigation of airfreight rates. (Docket 1705 et al.)

Feb. 4. Hearing on Continental Air Lines' route consolidation case. (Docket 576 et al.)

Feb. 9. Hearing on Mid-Continent's application for alternate Kansas City-New Orleans route. (Docket 1956.)

Feb. 21. Hearing on Mid-Continent's Minot, N. D.-Regina, Saskatchewan, route case. (Docket 628.)

Mar. 1. Hearing on additional service in Hawaiian Islands. (Docket 2390 et al.)

Two New Feederlines To Inaugurate Service

Two new feeders—Wisconsin Central Airlines, Clintonville, Wis., and Piedmont Airlines, Winston-Salem, N. C.—are slated to begin service next month, bringing the total number of short-haul carriers in operation to ten.

Wisconsin Central's Lockheed Electras are to start serving 15 of the 34 points on the system on Feb. 1. Initial flights will stop at Chicago, Ill.; Racine-Kenosha, Milwaukee, Madison, Baraboo-Portage, Oshkosh, Clintonville, Stevens Point-Wisconsin Rapids, Wausau, Rhinelander and Eau Claire, Wis.; Hibbing-Chisholm, St. Cloud and Minneapolis-St. Paul, Minn.; and Superior, Wis.-Duluth, Minn.

About Feb. 14, Piedmont plans to inaugurate one roundtrip DC-3 flight daily between Cincinnati, Ohio; Lexington, Ky.; Bristol, Va.; Asheville, Charlotte, Southern Pines-Pinehurst-Aberdeen and Wilmington, N. C. Service between Louisville and Lexington, Ky.; Bristol, Va.; Winston-Salem, Greensboro-High Point, Raleigh-Durham, Goldsboro and New Bern, N. C., is scheduled to start about Feb. 20.

Piedmont has asked CAB for not less than 60 cents a plane mile mail pay for its first six months of operation. As with other short-haul carriers, the rate will drop to 55 cents a plane mile the next three months and decline 5 cents more each succeeding three-month period until approximately 18 months from the inauguration of service mail pay will be 35 cents a plane mile.

Industry Hails Report By Policy Commission

The President's Air Policy Commission report issued this month (AVIATION WEEK, Jan. 19) has received warm indorsement from all segments of the air transport industry.

Warren Lee Pierson, chairman of TWA's board of directors, termed the report "evidence of real understanding of the problems of the scheduled airlines." He said the study is almost entirely consistent with the views of the larger carriers, adding that the Commission's recommendations relative to government responsibilities are "heartening to the industry."

Other statements of approval were issued by E. V. Rickenbacker, president of Eastern Air Lines, and W. A. Patterson, president of United.

David L. Behncke, president of the Air Line Pilots Association, said the policy group's indorsement of the Independent Air Safety Board idea is a substantial contribution to the solution of the air safety dilemma.

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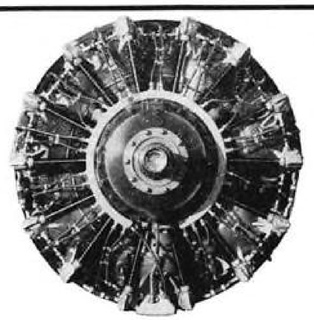

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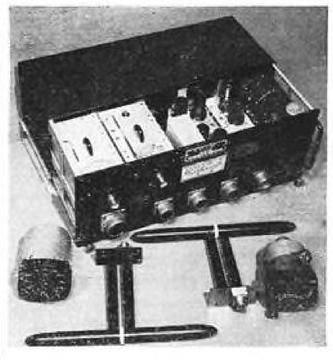

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SEARCHLIGHT SECTION
(Classified Advertising)

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Long Range Question

Must air transportation look always to the Federal government for succor? Is it content to pile request upon request for more mail pay, and higher fares, yet demand that the government outlaw a trial by those who seek to show—for free—whether it is possible to operate more efficiently at lower rates?

It required pioneers like Slick, the Flying Tigers and Willis to prove to the certificated airlines how much cargo business could be sold by enough work. The major members of the Air Transport Association then "boldly" cut cargo rates to meet this competition, at the same time they were raising passenger fares and appealing to the government and the taxpayers for more mail money, and getting it. The independents, still without direct subsidy of any kind, manage to carry on.

The attitude of the public seems to be that if skinny, brazen, unknown but wide-awake go-getters like the uncertificated, unsubsidized companies could land so much new business, why couldn't the experienced, certificated carriers?

These are not petty questions. This is not any personal "dispute." We admire those accomplishments the ATA's members have chalked up. But many taxpayers are asking sincerely for answers. And it is idle to think they will stop asking. Is there no outlook for air transportation except bigger and better government crutches? And why, the naive taxpayer asks, isn't the government giving a fair chance to those who claim they can fly and serve the public without subsidy. Consider Santa Fe Skyway.

Skyway was one of the most efficient uncertificated air freight lines, backed by an outstanding railroad. It ceased operations Jan. 15 because of the CAB's "obviously unfriendly attitude."

Yet Santa Fe Skyway has never asked for any kind of government subsidy, or equipment development hand-outs. Its officials expressed themselves content to provide airlift in the cargo field only, and offered a plan of air-surface coordination that would have expedited freight to hundreds of communities now without air service. Furthermore, Skyway's efforts, like those of the other outstanding air freight lines, would have generated air freight tonnage to increase the revenues of virtually all other air carriers.

As Skyway's parent company pointed out in its petitions for consideration by CAB, the Atchison, Topeka & Santa Fe is a vital participant in the economic life of hundreds of cities and towns along its 13,000 miles of mainline rails in 12 states from Chicago to the Gulf and California. Many thousands of businesses of all kinds, including the retail trades, farming, cattle raising, mining, lumbering and manufacturing, are in various degrees dependent upon the Santa Fe. Many of these communities were brought into being because of the existence of the railroad. The railroad's active interest in air freight was stimulating air cargo business through the rail system. There was considerable evidence that the certificated airlines were benefitting as much as the Santa Fe's own airline subsidiary.

Skyway was backed by the resources of a company with a net worth far exceeding that of the entire air transport industry.

"Because of the failure of the Civil Aeronautics Board for over one year to hear Santa Fe's comprehensive plans for participation in air cargo operations and because of the Board's action Dec. 5 denying interim common carrier rights to Skyway, there is lost to the nation a going air transport operation with know-how and financial resources sorely needed to help broaden and make sound the base of the air transport industry," one company spokesman said.

"Santa Fe's program would have steadily brought into beneficial use many costly airports in an area where only about a third of the class III or larger landing fields now give the limited service of retrenching civil airlines." It would have done this without Federal aid.

Santa Fe flew 2,015,000 plane miles. In October it was flying freight at the rate of about 16,000,000 ton miles a year. Without common carrier authority Skyway found it necessary to refuse more than twice as much freight tonnage as was carried for regular shippers under contract. It never had an accident in the air. Only one scheduled revenue flight was canceled by mechanical failures since Skyway started July 31, 1946. It had 140 employes. Flying, and mechanical standards were high. "At a time when the nation is committed to superior air power, a part of which is 200 to 300 percent increase in civil airlift, the CAB attitude toward Santa Fe does not represent thinking based on public interest," a spokesman contended.

At this point, we are not ready to advocate declaration of a policy permitting surface carriers full rights to operate airlines. But we do agree with the President's Air Policy Commission when it says:

"If the Board finds that the public convenience and necessity does require some additional common carrier operators, we hope that it will give weight to the records built up by any of those contract carriers that have proven their ability to operate economically and efficiently and now desire common carrier status."

We agree at this time with the Commission's recommendation "that the CAB prevent the control by surface carriers of the U. S. air transport system or any important segment thereof." And we also agree when it says:

"We believe, however, that individual progressive surface carriers, desirous of developing air transport as a part of a coordinated service, should not be automatically prevented from such action simply on the grounds that they are surface carriers—as now appears from the record to be the case. We recommend that the Congress enact legislation clarifying these two points."

The CAB has been derelict in its duty in the Santa Fe Skyway case. It has denied the tax-ridden American people another yardstick with which to measure the service and rates it is paying for. We cannot go along with those who say that the Santa Fe's case was the railroads' foot in the door. As long as Skyway operated generally over its railroad territory it could have been considered a coordinated system. Various other legal restrictions might have kept it in experimental status. The contention of the old line air carriers that it was robbing them of business the American taxpayer was already paying for is to deny that Santa Fe was creating new business for the industry.

Santa Fe Skyway, asking nothing from the government, was serving business and industry. It was operating as a check on those who claim subsidy is necessary to perform an adequate public service. Some day Congress must decide on some line of demarcation between the one extreme of high subsidy and those who claim they need none. Until it meets this problem squarely the public is not getting the most for its money.

ROBERT H. WOOD

Tyrone Power, Cesar Romero and Director Henry King

on location in Mexico during the filming of the 20th Century-Fox technicolor picture

"CAPTAIN FROM CASTILE"

Cortez flies to Mexico

WHEN 20th Century-Fox undertook the filming of "Captain from Castile" *right where it happened* in the rugged mountains of Mexico, it faced some appalling transportation problems: four to six days' travel time between each of the three main locations, and an operating cost of $60,000 a day!

But Henry King, director, simply added a 200-mph twin-engine Beechcraft Executive Transport to the staff. The trip between each location—Morelia, Uruapan and Acapulco—was reduced to 50 minutes! The Beechcraft flew actors, supplies and technicians between these historic "stages" on a moment's notice.

"The Beechcraft was all-important to us in making this picture," says Mr. King. And in many other American industries similar records are hung up by the Beechcraft Executive Transport every day. Its prime purpose is the quick and efficient transportation of personnel and materials on a company's own schedule and between a company's own selection of destinations, whatever they may be.

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