AVIATION WEEK

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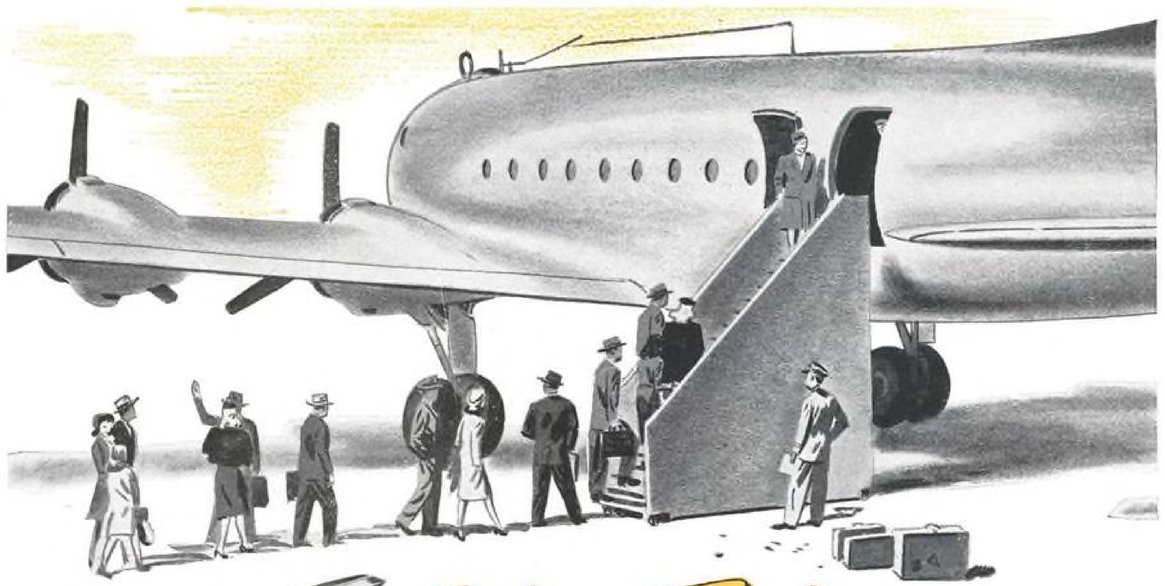

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They added wheels to subtract weight

TO TRIM the Navy's Constitution to fighting weight, Lockheed design engineers needed the lightest possible landing gear equipment. At the same time, this equipment had to provide maximum safety and comfort for the 180 passengers carried by the long range transport.

Studying the problem, B. F. Goodrich and Lockheed engineers came up with a new design—*tandem twin* wheels for the main landing gears, duals for the nose. That's 10 wheels in all. By using more—and smaller—wheels, engineers shaved a *ton* off the Constitution's weight!

In addition, B. F. Goodrich tandem twin wheels have five other big advantages: 1) *greater safety*—if one of the four tires goes flat, the pilot's control of the plane is unaffected; 2) *greater economy*—even in landings with one twin tire flat, the wheel and often the tire are still good for additional service; 3) *more comfort*—with four air chambers, landings are smoother; 4) *better design*—the four small wheels take up less space when retracted; 5) *better load distribution*—with the load distributed over a greater area, very thick runways are not needed, more airports can be used.

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B.F.Goodrich
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NEWS SIDELIGHTS

Jet Propelled PRO's

Naval aviation public relations officers, all rated pilots with combat records, are undergoing 10 day tours of duty at Naval Air Experimental Center at Patuxent, Md., during which they fly all the latest Navy jet planes. Theory is that to do an accurate job of explaining naval aviation to the public, PROs should have first-hand knowledge of their subject. In contrast, Air Force public relations has few active pilots, most of whom put in their flying time on trainers at Bolling Field to collect their 50 percent extra flight pay.

CAB Losing Hair Shirt

CAB's understaffed Enforcement and Litigation Section, which has been trying to control the rambunctious nonscheduled carriers in the postwar period, is in the switches again. The section's chief, Don Reynolds, who has been a hair shirt to the larger passenger-carrying nonscheds and contract operators, has quit his post in favor of a better-paying position with Pan American Airways' legal staff.

B-29s Uncensored

For more than two years after the war, Air Force censored the story of how the Boeing B-29 "Gen. H. H. Arnold Special" landed in Russia in 1944 after a combat mission to Manchuria due to a gas shortage. This was one of three superforts that made emergency landings in Russia and served as copies for the Russian B-29's manufactured in the Far East Aircraft factory in the Ural Mountains. But first postwar leak on the fact that Russians were making B-29 copies came from USAF Commander Carl Spaatz last fall testifying before the President's Air Policy Commission. Although pix of Russian B-29's have now been widely printed in aviation publications, Navy still classifies its prints as confidential.

Navy Bucks Transfers

Legislation authorizing personnel transfers between the Air Force and Navy faces stiff opposition from Navy Department mouthpieces on Capitol Hill. Introducing the measure last week, Rep. Carl Hinshaw (R., Calif.) charged that Navy's opposition to the proposal "is an expression of weakness." It would not only promote understanding between the rowing services, he pointed out, but, by permitting top-bracket naval aviators to enter USAF where they are urgently needed, open the way for promotion of younger naval aviators.

New Air Force Day

W. Stuart Symington III, Secretary of the Air Force, has changed Air Force Day from Aug. 1, anniversary of founding the aeronautical division of the Signal Corps in 1907, to Sept. 18, the day the U. S. Air Force was activated under the Unification Act in 1947.

Competition Tangle

Administration's regulated competition system for overseas air transportation took a setback when the Congressional Air Policy Board conspicuously failed to recommend CAB authority over international rates of scheduled carriers. Board's omission was more conspicuous in view of the fact it urged CAB economic regulation of non-certificated carriers, internationally as well as domestically. Lack of authority of CAB to fix international rates of scheduled lines has been a major weakness in the U. S. overseas system. Although it hasn't happened, any U. S. carrier could blow up a bilateral agreement U. S. was committed to, simply by refusing to comply with agreed rates. Administration has persistently since the end of the war asked Congress for CAB authority over international rates. President's Air Policy Commission backed the request.

The Scoop That Wasn't

The publicity splash achieved by the Navy last week with the FJ-1 tests on the carrier Boxer points up the Congressional Air Policy Board's criticism of misleading Air Force and Navy public relations. This was not the first time a Navy jet fighter has taken off and landed from carrier at sea, nor does it establish the practicality of jet operations from a carrier—two of the many inaccurate statements emanating from the Boxer.

As long ago as the Fall of 1946, the Navy conducted public demonstrations on the Franklin D. Roosevelt with a McDonnell FH-1 Phantom piloted by a Navy flyer. And although the Navy has a Phantom squadron operational it is not yet aboard a carrier. So far the Navy hasn't been able to use more than two jets aboard a carrier because it hasn't figured out how to handle more than two blow torches at once on a single flight deck. It is expected that it will be a long time before the FJ-1s are operational.

CAB Speedup

The present CAB, with two vacancies, is outdoing the record of the full five-man Board so far as cutting down on the work backlog is concerned. This month, for the first time in over a year, CAB has less than 1,000 cases pending. Decision in the Middle Atlantic area case eliminated over 60 dockets in one swoop. And the Board is at last catching up with, and dismissing by the score, route applications of companies long since deceased.

Miller Moving

H. B. Miller resigned last week as executive director of the Congressional Air Policy Board to take a new job, and the reins passed to William Westlake, previously the joint group's executive secretary. Westlake expects to wind up the Board's activities soon with drafting of legislation based on recommendations in its March 1 report.

Turbine Concern

Little appreciated, apparently—even in high government circles—is the concern felt by turbine engine developers over military apathy toward scarcity of elemental metals that give vital toughness to flame-bathed structures within the engine.

They report that military procurement officers assure them that "all is well" but decline to back it up with evidence.

Turbine men declare that such metals as cobalt and titanium relate to jet engine success as uranium and thorium to the atom bomb. They feel that national security calls for an aggressive stand on discovery and development of new sources of supply.

A report from Canada that Russia recently approached a Dominion mining group with an open bid for all cobalt that it could supply is significant to U. S. engineers. They breathed easier on learning that the Canadian mining company said no to Moscow.

NEWS DIGEST

DOMESTIC

Air Materiel Command will lease substantial numbers of Curtiss C-46F Commando transports to any established airline at a flat rate of $300 per month per plane. Last production military model of the famous plane, the C-46F features double rear loading doors, ideal for cargo work. A total of 234 was delivered during the war.

Air Coordinating Committee approved the extensive program prepared by a special subcommittee of the Radio Technical Commission for Aeronautics, which has also been endorsed by the Congressional Air Policy Board.

Joint Chiefs of Staff met in Key West with Secretary of Defense Forrestal to render basic decisions on "who would do what with what and where" in the event of an emergency. Presidential directive and sudden changes in international situation precipitated meeting. Gen. Carl Spaatz and Lieut. Gen. Lauris Norstad were only Air Force representatives.

FINANCIAL

Texas Engineering and Manufacturing Co. reports net earnings for 1947 of $370,658 or $3.31 per share on sales of $5,895,255. Company paid off bank indebtedness of $808,199 and reduced accounts payable from $875,536 to $10,213 during calendar year.

Boeing Airplane Co. reports net loss of $356,528 for the first nine months of 1947. Directors have voted a $1 dividend, the first since April 4 last year.

FOREIGN

Griffith Brewer, 80, widely known British aviation pioneer and long-time friend of the Wright brothers, died in London. Brewer held airman's certificate No. 5 and established the Wilbur Wright memorial lecture in 1912.

Pakistan Government has granted Iraqi airways a six-month permit for weekly flights between Baghdad and Karachi using Vickers Viking transports. Both passengers and freight will be carried. A bilateral air agreement between the two countries is expected shortly.

Compania Aerovias Nacionales del Sur, S.A. (Andes), a new Peruvian airline, has applied to the general directorate of civil aeronautics in Peru for an operating permit to fly cargo, mail and passengers using three Curtiss Commando transports. One of the principal cargo items to be shipped is fresh-killed beef for the Lima market.

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Certification of 6 Freight Lines Recommended by CAB Examiners

Route applications by Slick, California Eastern, Flying Tigers, U. S. and Willis favored in report; modified area-to-area operations endorsed.

By CHARLES ADAMS

A certificated nationwide network of all-cargo routes connecting the seven most important airfreight-generating areas in the U. S. has been recommended by CAB examiners.

Nominated to operate the new services were five of the country's best-known airfreight lines—all of which came into being after the war. They are Slick Airways, California Eastern Airways, the Flying Tiger Line, U. S. Airlines and Willis Air Service. Additionally, Airnews, Inc., San Antonio, was recommended for a small all-cargo operation in southern Texas.

► **Active Operators**—With the exception of U. S., all are currently engaged in common carrier freight services under temporary letters of registration issued by CAB. U. S. also holds a letter of registration but suspended service last November to conserve capital pending a decision on its bid for a certificate.

CAB was urged to reject applications of one certificated carrier and seven other companies seeking all-cargo routes. One such bid was by Capital Airlines (PCA), which requested new links to California and the Pacific Northwest. Others were by Air Borne Cargo Lines, American Air Express Corp., Mutual Aviation, Lone Star Air Cargo Lines, Air Cargo Transport Corp., Calasia Air Transport (Air Travel, Inc.) and Flamingo Air Service.

► **ATA Setback**—Conclusions of Examiners William F. Cusick and R. Vernon Radcliffe represent a major setback for the Air Transport Association and 11 domestic trunklines which are actively opposing establishment of any all-cargo routes. Even so, the report was far from a blanket endorsement of the airfreight carriers' aims.

The examiners recommended that the certificates be limited to a three-year period. "It must be recognized," the report declared, "that the experiment may result in a division of cargo traffic between the all-property carriers and the multiple-service (passenger carrying) lines which will not permit economic service by either type of operator."

► **Basis for Report**—The examiners' support for temporary certification of all-cargo routes was based on a belief that the public will benefit from the new services and that there is sufficient cargo potential to support them. "Possibilities for greater economics cannot be overlooked when there is concentration on one type of traffic," the report stated.

"These economies appear not only in operations but in administration and customer contact as well. It is of course recognized that the realization of these advantages depends on over-all managerial efficiency, which, by its presence or absence, may well tip the balance."

► **No Mail**—Examiners Cusick and Radcliffe emphasized that the carriers selected will not be authorized to carry mail. "Under the circumstances," they observed, "it would seem to be a much more vital matter for all-cargo carriers to attain a large enough volume of traffic to insure economic operations than would be the case with multiple-service carriers which could look to other sources for needed revenue."

In finding that all-cargo carriers offer greater promise of developing airfreight than do the presently-certificated passenger-carrying lines, the examiners took special notice of national defense needs. They decided that military interests are best served by maintenance of transport air services on the largest practicable scale, adding that all-cargo lines by developing more freight traffic would work to this end.

► **Subsidy Problem**—The report said it is doubtful whether reservation of the airfreight field to presently-certificated operators would assist materially the companies most in need of additional revenue. It noted that the smaller certificated lines, which have the greatest dependence on government mail pay, have only limited freight potential over their short-haul routes, and traffic diversion by all-cargo operators would be minor.

Routes recommended by the two CAB examiners represent an endorsement of the modified area-to-area concept of operation advanced by a number of the applicants. Regions served would be: California, the Northwest, North Central, Northeast, Texas, Louisiana and Southeast areas. Denial of all applications seeking conventional point-to-point service was urged by the examiners.

► **Traffic Flow**—The report declared that an overwhelming majority of data introduced in the case showed that the

BRITISH ALL-WEATHER FIGHTER

De Havilland Sea Hornet XXI contains radar search equipment in special nose. Normally a single-seat carrier fighter, this version has second crew member (hidden by wing) in aft fuselage to operate radar gear. Note flame-damping equipment on Merlin engine exhaust shrouds. Sea Hornet has four 20 mm. cannon in fuselage under nose and top speed of better than 450 mph. ("Flight" photo)

PANTHER BELLY EXPOSED

Action shot of Grumman XF9F-2 Panther jet fighter in roll away from camera plane reveals huge fillet fairing wing into fuselage. New wing tip fuel tanks are shown for first time. Prototype is undergoing preliminary stability and control flight tests preparatory to delivery to Naval Air Station Patuxent for Navy performance tests. One hundred Panther fighters are in production (H. G. Martin photo)

traffic flow of an all-property operation is predominantly from area to area. It said that while CAB lacks the power under the Civil Aeronautics Act to issue area-to-area certificates which fail to name terminal and intermediate points, the Board has the authority to permit service between specified points in one area and designated points in other areas.

In practice, the all-cargo carriers plan to have "regular" and "demand" services from the points in one area to points in another. The regular service would be what its name implies and would be rendered to places with consistently substantial cargo volume. Demand points, on the other hand, would be flag stops, served only when a certain minimum shipment—possibly 1000 lb.—is available.

► **Demand Points**—No special designation of a certificated point as a flag stop or demand point will be necessary. TWA has for some time listed Grand Canyon, Ariz., a regularly-certificated point on AM 2, for flag stop service to take on or discharge passengers or cargo. United has scheduled service to Elko, Nev., on a similar basis.

The CAB examiners denied the contention by one all-cargo applicant—U. S. Airlines—that the authority of the presently-certificated carriers to fly property does not include the right to haul freight. U. S. had said that the word "property" in prewar grandfather certificate cases applied only to express and baggage since there was no such thing as airfreight. The examiners pointed out, however, that CAB in 1939 stated that "the terms persons, property and mail are broad enough to include all classes of traffic which may be carried by airplane."

► **Cost Arguments**—Arguments by the certificated airlines that they can carry freight at an "added cost" which is far lower than any all-cargo carrier's expenses were challenged by examiners Cusick and Radcliffe. The multiple-service lines have maintained in the current freight rate investigation, as well as in the route case, that carrying freight in empty space available on combination passenger/cargo planes costs no more than two to five cents a ton mile. They said freight generally can be handled with existing station personnel and facilities.

The examiners observed that the added-cost arguments appear partially valid with respect to station personnel and facilities at points where freight traffic is low. "But when the larger traffic points are considered, the argument loses force. As freight volume grows, the relative amount that can move in combination equipment—as opposed to all-cargo planes—will become less," the report said.

► **Separate Handling**—"A considerable all-cargo operation at any point will make necessary separate freight terminal handling and loading facilities, perhaps at a different airport than is used for passenger flights. Rather than acquire additional space for freight reservations employes at the relatively expensive locations used for passenger sales, the multiple-service carriers will doubtless locate them in less costly space, probably at the freight terminal. As traffic grows, a fairly complete segregation of passenger and freight operations will follow, and the operations of multiple-service carriers at major points will closely resemble those of an all-cargo operator."

Authorizations recommended by the examiners:

• **Flying Tiger Line**—Transportation of property between any point in the following groups of points and any point in another group: (A) Co-terminals Los Angeles/San Francisco, intermediate points Bakersfield, Brawley-El Centro, Fresno, Long Beach, Oakland, Sacramento, Salinas-Monterey, San Diego, Santa Barbara, Stockton and Thermal; (B) Longview, Portland, Seattle, Wenatchee and Yakima; (C) Minneapolis/St. Paul; (D) Des Moines, Kansas City and Omaha; (E) Chicago, Cleveland, Detroit, Grand Rapids, Milwaukee, South Bend and Toledo; (F) Albany, Binghamton, Boston, Buffalo, Hartford, New York, Newark, Providence and Rochester; (G) Co-terminals Portland/Rockland.

• **California Eastern**—(A) Co-terminals Los Angeles/San Francisco and same California intermediate points listed in (A) above; (B) Denver; (C) Des Moines, Kansas City and Omaha; (D) Akron, Chicago, Cleveland, Columbus, Dayton, Fort Wayne, Indianapolis, Peoria, South Bend and Toledo; (E) Allentown, Baltimore, Harrisburg, Newark, Philadelphia, Pittsburgh, Washington and Wilmington and the terminal New York.

• **Slick**—(A) Co-terminals Los Angeles/San Francisco and same California intermediate points listed in area (A) above; (B) Phoenix; (C) Brownsville, Corpus Christi, Eagle Pass, Fort Worth/Dallas, Houston, Laredo, Mission and San Antonio; (D) Akron, Cincinnati, Cleveland, Columbus, Dayton, Detroit, Fort Wayne, Indianapolis, Louisville, Peoria, St. Louis, South Bend and Toledo and terminal point Chicago. Also between the points in areas (A), (B), and (C), above, and (E) the intermediate points Baton Rouge, Gulfport/Biloxi, Hammond, Mobile, Morgan City and New Orleans; (F) Albany, Allentown, Baltimore, Binghamton, Boston, Harrisburg, Hartford, New York, Newark, Philadelphia, Providence, Washington and Wilmington; (G) Co-terminals Portland and Rockland, Me.

• **U. S. Airlines**—(A) Terminal Miami, intermediate points Atlanta, Belle Glade, Fort Myers, Jacksonville, Lakeland, Ocala, Orlando, Sarasota/Bradenton, Savannah, Tampa/St. Petersburg, Valdosta and West Palm Beach; (B) Baton Rouge, Gulfport/Biloxi, Hammond, Mobile, Morgan City and New Orleans; (C) Akron, Chicago, Cincinnati, Cleveland, Columbus, Dayton, Detroit, Grand Rapids, Indianapolis, Louisville, Milwaukee and South Bend; (D) Terminal Point Minneapolis/St. Paul.

• **Willis**—(A) Same Southeastern points listed in (A) above for U. S.; (B) Intermediate points Albany, Allentown, Baltimore, Binghamton, Boston, Harrisburg, Hartford, Newark, Philadelphia, Providence, Washington and Wilmington and terminal point New York.

• **Airnews**—(A) Terminal point San Antonio, intermediate point Beeville, terminal point Corpus Christi; (B) Terminal point San Antonio, intermediate points McAllen and Harlingen, terminal point Brownsville.

Arresting hook is in down position on the FJ-1. Above and to left of star is door inlet for air which flows between fuselage structure and turbojet tail pipe to carry off tail pipe heat radiation. Venturi action of tailpipe exhaust sucks air in through door. Exhaust of coolant air is through tail cone orifice containing engine tail pipe. (Photo by A. U. Schmidt)

Crewmen engage heavy steel cable "bridle" connecting catapult hook rising from track slot in deck behind nose wheel, with airplane hook at rear end of nose wheel well. Opened door on side of fuselage serves as step and also exposes hydraulic hand pump for retracting nose gear for kneeling of plane onto dolly. (Photo by A. U. Schmidt)

FJ-1 pitches forward on nose wheel as arresting cable brings aircraft to halt. Taken at deck level, the picture shows black line of consecutively spaced arresting cables raised several inches above deck by supporting plates. (Photo by A. U. Schmidt)

FJ-1 Makes First Carrier Test

North American jet fighter clears deck in 700 ft. on fly-off experiment.

By SCHOLER BANGS

Two North American FJ-1s of Squadron F-5-A operating aboard the Essex-class carrier "Boxer," have completed experimental tests covering 24 landings and takeoffs. Previous shipboard jet tests have been conducted with British Vampires, Lockheed P-80s and McDonnell "Phantoms."

In fly-off tests, the FJ-1 was able to break clear of the deck within 700 ft. on several launchings. Deck length of the "Boxer" is 880 ft.

The first plane down, piloted by Cmdr. E. P. Aurand, commanding officer of the squadron, engaged the carrier's arresting cable and was halted after a roll of 60 ft.

► **200 Practice Flights**—Landing and launching techniques developed in some 200 training flights ashore by the two pilots brought good results in actual carrier operations.

In approach to the carrier the FJ-1 entered its lineup with the deck approximately 200 yd. farther away than is customary with propeller aircraft, which continue in their banked turn to the left until almost upon the carrier's fantail. The jet technique is indicated by the longer glide, without the braking effect of a propeller, and the necessity for having the aircraft lined up for the signal officer's "cut" or waveoff while still some distance from the deck.

► **Landing Technique**—Upon receiving the signal officer's "cut," at an altitude of approximately 35 ft. above the deck level, the jet pilot retards the plane's throttle to its idle thrust block, retaining a turbine speed of 3200-3500 rpm. and delivering somewhat less than 50 percent thrust.

At the same time the nose is dropped, and a partial flareout is effected just above the deck with the result that the tail hook engages an arresting cable just as the plane lands solidly on its main gear and then pitches forward on the nose wheel.

In a wave-off the carrier jet pilot is flying sufficiently above stalling power so that he can maneuver clear of the deck area while recovering turbine power.

During the "Boxer" tests, a 40 mph. deck wind was maintained during flying and catapult launchings. In the former, the FJ-1s were stationed at the extreme stern of the flight deck and turbines were built up to maximum thrust rpm. before brakes were released.

During initial flyoff launchings the entire deck length was used although in later runs the jets were broken clear after runs of 600-700 ft.

Catapult launching involved fastening of the catapult cable to a slip hook exposed at the rear of the nose wheel well, and snubbing the plane forward to take slack out of a restraining cable. In one timed launching, the plane was in the air 1.7 seconds after release from the restraining cable. Pilot later reported an air speed in excess of 135 mph. as the jet cleared the forward edge of the deck.

► **Pilot Reaction**—In subsequent review of the tests, Cmdr. Aurand gave a pilot's reaction to characteristics of the FJ-1 in carrier operation:

"The visibility is what impresses you most. For the first time I not only knew what I was doing, but actually saw what I was doing in my landing approach. Usually by the time you're down to the deck with a propeller plane you are busy lining up the deck by looking out to the side. It was almost frightening to look ahead from the FJ and see the barriers for the first time. The jet is the easiest plane to land . . . You just fly it down and there you are."

Congressional Groups Move Slowly Toward Civil Air Shifts

Final decisions on revamping Civil Aeronautics Commission, Civil Aeronautics Board will wait on report of Hoover Reorganization Commission.

Congress moved forward last week with legislation to revamp organization of government agencies in civil aviation, but promised to accomplish little more than surface-scratching in that controversial field during the present session.

Proposal for a reorganization of aviation agencies has broached the broader matter of a far-reaching reorganization of all government agencies concerned with transportation.

While the Congressional Aviation Policy Board drafted legislation implementing its recommendation on reorganization of Civil Aeronautics Administration and Civil Aeronautics Board, a subcommittee of the Senate Interstate and Foreign Commerce Committee completed its first series of hearings on a bill setting up a department of transportation. Subcommittee is headed by Sen. Homer Capehart (Rep., Ind.), also author of the department of transportation measure and the chairman of the government organization subcommittee of the Aviation Policy Board. Hearings on the bill, vigorously opposed by acting CAB chairman Oswald Ryan as "detrimental to the development of air transportation," will be resumed tomorrow (Mar. 23).

► **Await Commission** — Meanwhile, sentiment on Capitol Hill indicates that no far-reaching revisions in government organization of transportation agencies will be effected until the recommendations of the Commission on Organization of the Executive Branch have been made. The Commission, established by Congress and given the mission of working out a modernization of the executive branch, is headed by former President Herbert Hoover, and scheduled to make its recommendations at the beginning of next year.

The Capehart bill, setting up a department of transportation headed by a secretary, and under secretary, and three assistant secretaries, was whole-heartedly approved last week by Interstate Commerce Commissioner Monroe Johnson, also Office of Defense Transportation director. It was endorsed, with qualifications, by Under Secretary of Commerce William Foster, and opposed by Maritime Commission's chairman, Vice Adm. William Smith, as well as by Ryan.

► **Urge Unified Control**—Johnson urged unified control of government transportation activities, the general objective of the bill. He pointed out that airlines now deal with 20 government agencies, railroads with 18, shipping companies with 27, trucking firms with 17 agencies.

Foster gave Commerce Department's endorsement to the principle of unification of transportation agencies and activities, but questioned the "timeliness" of creating the department of transportation, and proposed that additional study of the matter be undertaken.

► **Ryan's Argument**—Ryan argued that aggressive, independent development of air transportation would be smothered under unified transportation control. Although the bill would remove the quasi-judicial rate-making and regulatory functions of CAB, ICC, and Maritime Commission from jurisdiction of the top-stratum of secretaries of the department of transportation, Ryan proposed that, in practice, they would wield considerable authority over the regulatory agencies through power to control their personnel and budgets. Smith argued a similar case against loss of independence of control and development for the merchant marine.

The divergent conclusions reached by the President's Air Policy Commission and the Congressional Aviation Policy Board—both of which made intensive studies of aviation agency organization—indicate that Congress will encounter difficulties in arriving at a solution.

► **Policy Legislation**—Legislation carrying out the recommendations of the Air Policy Board will be introduced in the immediate future by Capehart, and probably will receive early hearings by the Senate Interstate Commerce Committee. This will call for abolition of CAA, with its functions split between the Commerce Department and CAB. An "Office of Civil Aviation" in Commerce would take over airport development and airways operations. CAA's current activities in promulgation and administration of safety regulations would be lodged in a CAB completely-divorced, even for "housekeeping purposes," from Commerce. The set-up would also include a completely-independent director of air safety.

The Air Policy Board's proposals for a completely independent CAB and air safety director are in conflict with the terms and objectives of the department of transportation bill which would bring CAB and air safety activities under the department, and—although giving the board "independence" on quasi-judicial matters—contemplates coordination of the regulatory activities of CAB, ICC, and Maritime by the top stratum of secretaries.

The President's Air Policy Commission's recommendations—which will probably receive an airing at the time of hearings on the Congressional Board's proposal—call for strengthening, instead of diminishing, Commerce Department's air arm. CAA would be augmented into a department of civilian aviation, headed by a secretary who would report to the Secretary of Commerce. Three independent agencies would be lodged for housekeeping purposes in the department—CAB, an aircraft development corporation, and an air safety board. Ultimately, the Commission contemplated the department of civil aviation evolving into a department of transportation, which, together with a department of industry and trade, would come under a "super secretary" of Commerce.

RESEARCH LEADERS CONVENE

Shown above are members of the National Advisory Committee for Aeronautics at their recent meeting in Washington, D. C. Left to right are: John W. Crowley (NACA), Ronald M. Hazen (Allison), Arthur E. Raymond (Douglas), Rear Admiral T. C. Lonnquest (Bu Aer), Maj. Gen. L. C. Craigie (USAF), Rear Admiral Joseph J. Clark (Office of DCNO Air), General Carl Spaatz (USAF), Dr. Vannevar Bush (RDB), Admiral J. H. Tower, Ret., Dr. J. C. Runsaker (MIT), Chairman NACA, Dr. Alexander Wetmore (Smithsonian), Dr. F. W. Reichelderfer (Weather Bureau), Dr. Edward U. Condon (Bureau of Standards), John R. Alison (Asst. Sec. Commerce), William Littlewood (American Airlines), Dr. George W. Lewis (consultant). Back row: John F. Victory, NACA secretary, Dr. Lyman J. Briggs, Dr. Hugh L. Dryden, Director of Research. Standing: Smith J. DeFrance (Ames), H. J. E. Reid (Langley) and Edward R. Sharp (Cleveland). (USAF photo)

Probes Under Way In DC-4 Accidents

Cause of two DC-4 accidents involving a Northwest Airlines charter flight which hit a mountain in Alaska and a Delta Air Lines plane which crashed two days earlier after taking off from Chicago Municipal Airport remained undetermined last week.

Conditions which led to the NWA mishap 200 miles northeast of Anchorage probably will never be ascertained. The chartered plane, carrying 24 seamen and a crew of six from Shanghai to New York, hit Mount Sanford at an 11,000 ft. level killing all aboard. Some investigators said it may be impossible to reach the wreckage, which is in a glacier.

► **Union Acts**—The charter plane crash was the first fatal accident suffered by NWA on its Alaska-Orient route. One repercussion of the mishap was sharp criticism from the American Communications Association (CIO).

The union, which represents radio operators, filed a 30-day strike notice against Northwest. ACA attacked

NEW SIKORSKY DELIVERED TO NAVY

Latest model Sikorsky, the Navy XHJS-1, is most powerful and best performing version yet produced by the company with 110 mph. top speed, 19,000 ft. service ceiling and 330 mile range. New design is powered by 500 hp. Continental air-cooled radial engine. It features new high position of tail rotor to clear ship deck, strengthening main gear and revised nose enclosure for greater visibility. New all-metal rotors are used with 49 ft. diameter. XHJS-1 features special night flying instruments. (Navy photo)

"working conditions of men on charter flights," stating it felt that 30 to 36 hours on an airplane is too long for a crew member."

► **Progress Made**—Meanwhile, CAA and CAB investigators were making some progress in probing the Delta accident, but results will be withheld pending a formal hearing to be scheduled shortly. A special coroner's jury failed to learn the cause of the crash, in which 12 of the 13 persons aboard the Miami-bound flight were killed.

Traffic control personnel said the takeoff appeared normal until the plane reached 100-ft. altitude. The ship then reportedly went into an unusually steep climb to about 800 ft., stalled and dropped off to the right.

Meyers to Appeal

Maj. Gen. Bennett E. Meyers was sentenced to serve a 20-month-to-five-year term for subornation of perjury by federal Judge Alexander Holtzoff in Washington. Meyers' attorneys said they would appeal. The general also faces income tax evasion charges on a total of $26,708 in income and excess profits taxes. He began serving his sentence last week in Washington.

New Flight Training Plan Urged by VATA Group

Virginia Aviation Trades Association executive committee is studying plans for a national flight training program for young men and women between the ages of 16 and 21. VATA has asked National Aviation Trades Association to canvass other state chapters for recommendations on establishment of such a program.

The Virginia group, including newly elected officers and directors, met recently at Richmond for discussion of the training program, presumably sought as a replacement when GI flight training tapers off. Officers include: W. R. Ashburn, Alexandria, president; T. E. Frantz, Jr., Roanoke, vice-president; Miss Martha Anne Woodrum, Roanoke, secretary; H. P. Grim, Jr., Staunton, treasurer. Woody Edmundson, Lynchburg, international aerobatic champion, is VATA delegate to the national organization, and R. Pinkney Sowers is legal adviser.

Cornell Lab Begins Wind Tunnel Operations

The Cornell Aeronautical Laboratory highspeed wind tunnel, originally begun by Curtiss-Wright Corp., has been in operation since Mar. 1, following more than two years of construction. The $3,000,000 tunnel has test section 8½ ft. by 12 ft. and maximum speed of near-sonic velocity. It will be used by a group of participating aircraft companies for model tests of individual designs and for Cornell research contracts with various government agencies.

Originally a Curtiss Airplane Division research facility, the laboratory was given to Cornell University in 1946. A total of $675,000 was provided as working capital for the laboratory by Bell Aircraft, United Aircraft, Grumman Aircraft Engineering, Fairchild Engine and Airplane and Avco Manufacturing corporations. In addition five of these companies contributed a further $105,000 for the final calibration tests.

The tunnel is powered by 14,000 hp. electric motors. It is 178 ft. long, 81 ft. wide and 36 ft. high. The tunnel may be operated by three engineers stationed at a large control panel with the aid of automatic recording apparatus.

Boeing Union Election

The National Labor Relations Board will conduct a "union-shop" election at the Boeing Airplane Co. plant in Seattle, Wash., Mar. 22 to 26 at the request of District Lodge No. 751, Aeronautical Mechanics' Union. A majority of the more than 13,000 employees of the company eligible to belong to the union must vote for a "union shop" before the union can request such a shop of the company. The union has been recognized as the workers' bargaining agent since well before the war.

AVIATION CALENDAR

Mar. 22—ICAO aeronautical maps and charts division, Brussels.
Mar. 28-31—Annual conference, Society of the Plastics Industry, Santa Barbara, Calif.
Mar. 30—ICAO personnel licensing division, Montreal.
Mar. 30-Apr. 1—Air Transport Association engineering and maintenance conference, Continental Hotel, Kansas City.
Mar. 31—Society of Automotive Engineers, metropolitan section, aeronautic panel meeting on Cabin Supercharging for Fighter Aircraft, New York City.
Apr. 1-3—American Institute of Electrical Engineers, Des Moines.
Apr. 4-8—American Association of Airport Executives, Congress Hotel, Chicago.
Apr. 5-8—National Association of Corrosion Engineers, Hotel Jefferson, St. Louis, Mo.
Apr. 7-9—Midwest power conference, Sheraton Hotel, Chicago.
Apr. 13-14-15—California Aviation Conference sponsored by Los Angeles, San Francisco and San Diego Chambers of Commerce, Los Angeles.
Apr. 17-18—Southern States Air Carnival, Montgomery, Ala.
Apr. 17-24—Northwest aviation exposition, Minneapolis auditorium, Minneapolis.
Apr. 20—ICAO rules of the air and air traffic control division, Montreal.
Apr. 20-21—Second Annual Third-Regional Aviation Conference, Minneapolis Auditorium.
Apr. 22-23—AIA personal aircraft council meeting, Dallas.
Apr. 22-24—Fourth annual forum, American Helicopter Society, Philadelphia.
Apr. 27—ICAO facilitation division, Europe.
Apr. 28-30—American Institute of Electrical Engineers, northeastern district meeting, New Haven, Conn.
May 4—ICAO North-Atlantic regional meeting, Paris.
May 12-15—Aviation Writers Association, 10th Annual Convention, New York City.
May 17—ICAO facilitation division, Geneva.
May 18-20—AIA board of governors meeting, Williamsburg, Va.
May 19—Air Commerce Day at Miami, part of World Trade Week observance.
May 20—ICAO European-Mediterranean regional meeting, Paris.
June 1—ICAO second assembly, Palais Des National, Geneva, Switzerland.
June 1-6—Second annual all woman air show, Miami.
June 14-15—Airlines Medical Directors Association, annual meeting, Royal York Hotel, Toronto.
June 15-17—Airport management conference, College Station, Tex.
June 16-18—19th annual meeting, Aero Medical Association, Royal York Hotel, Toronto.
June 17-18—Aviation Distributors and Manufacturers Association, Grand Hotel, Mackinac Island, Mich.

INDUSTRY OBSERVER

► **McDonnell Aircraft Corp. has delivered its 44th FH-1 Phantom jet fighter with the last of 60 scheduled for completion within the next few weeks. The second F2H-1 Banshee is now at Naval Air Station Patuxent for additional flight tests.**

► New Wright Cyclone R-3350-26W now being delivered to the Navy for Douglas AD-1 Skyraider installation has a dry takeoff rating of 2700 hp. with a water injection rating of well over 3000 hp. The new model of the 18-cylinder veteran engines, which powered the B-29 during the war, has an output approaching that of the giant 28-cylinder Wasp Major engine. The "most powerful 18-cylinder engine in the world" has undergone nearly a decade of intensive development since its original installation in the Douglas XB-19 with a 2000 hp. rating.

► **Air Force and Curtiss-Wright Corp. have written "finis" to the XC-113 project, an experimental Curtiss Commando transport in which a General Electric TG-100 turboprop engine was to have been installed. Abandonment of the TG-100 nearly two years ago slowed down the project and the airplane has now been dismantled for removal to Lockbourne Air Force Base.**

► Chinook jet engine built by A. V. Roe of Canada is purely a development project and is not scheduled for production. The new jet transport C-102 will be powered by four Rolls-Royce Derwent Mark V engines.

► **Exploratory negotiations between Northrop Aircraft, Inc., and Armstrong-Whitworth, British aircraft manufacturer, over possible licensing rights on the Northrop Turbodyne gas turbine have been discontinued without any definite agreement. The Turbodyne II has been under test for some time.**

► Safety requirements for contract air carriers flying passengers will be tightened under CAB proposals now being circulated to the industry for comment. The Board said a study of the record of contract carriers, including fatal accidents, reveals serious differences in some of the operations as compared with standards affecting both nonscheduled common carriers and the certificated airlines. Comments on the suggested amendments to Part 43 of the Civil Air Regulations are due by Apr. 15.

► **Howard Hughes contemplates indefinite control of the testing of the Hughes flying boat. This is indicated by his plan to spend $120,000 on a new movable steel-frame shelter for the big craft at its Long Beach, Calif. harbor dock. Present canvas-covered steel frame sections sheltering tail and outer wing panels will remain. But inboard frame shelter sections will be replaced by a paneled steel structure mounted upon tracks permitting shelter segments to be moved clear of structure as boat is moved in and out of dock.**

► Expansion of Aviation Maintenance Corp.'s "pooled maintenance" campaign is indicated by company's latest contract reports from Reagan C. Stunkel, president. AMC has acquired $500,000 worth of new overhaul business in four contracts signed with Pan American, TWA, Pacific Northern Airlines, and West Coast Airlines. Work covers eight aircraft and ranges from fire prevention modification to major overhaul. Previously AMC gained a contract with American Overseas airlines for major overhaul work on DC-4s.

► **Observers predict that Russian domination of Czechoslovakia will in no way affect the satellite country's membership in IATA. They see Russia using Czech participation in the organization as a means whereby the Russians can learn of international air transport developments from other countries without divulging information about themselves. Meanwhile, Pan American will continue its scheduled trips to Prague, and Ceskoslovenske Aerolinte, Czech national airline, plans to inaugurate Prague-New York service.**

► Convair's Air Force contract for 100 B-36 bombers has been cut back to 95 due to a shortage of government furnished equipment. B-36As are scheduled to begin arriving at the Tinker Field (Oklahoma City) modification center Apr. 1. All B-36 modification work will be done at Tinker Field before assignment of the very heavy bombers to tactical units of the Eighth Air Force.

► **Air Force orders for 23 Northrop Pioneer transports totals $5,500,000 and is for 13 assault transport versions and 10 Arctic rescue planes equipped with auxiliary ski landing gear.**

► Power boost from the original 100 hp. Monaco engine to a 145 hp. Gipsy Major features the new Chrislea Super Ace lightplane. The plane has a 128 mph. top speed and 115 mph. with a range of 400 miles.

► **Three British Bristol freighters have been sold to the French for operation in Indo-China by the Societe Indochinoise de Transports Aerien.**

ENGINEERING & PRODUCTION

AIA Sets Uniform Specifications On Nonflammable Hydraulic Fluid

Meeting of Aircraft Research and Testing Committee also discloses progress that has been made in solving other critical industry problems.

New uniform specifications for nonflammable hydraulic fluid have been set up by the Aircraft Research and Testing Committee (West Coast) of Aircraft Industries Association and soon will be submitted to CAA and Society of Automotive Engineers for final consideration.

Status of AIA's research was disclosed when members of the testing committee met in Hollywood, to hear progress reports on several critical projects.

► **Aluminum Sheet Short**—Concern was expressed over the lack of quantity production in this country of large tapered metal sheets vital to fabrication of stressed wing skins for new high-speed aircraft. To date all thickness-tapered skin stock has had to be hand-produced by plants requiring it, and evidence was given that manufacturers of aircraft soon will require the sheet in quantities warranting its volume production by aluminum suppliers.

Similarly, the western engineers foresee immediate need for new types of high-temperature duct sealing compounds, capable of withstanding temperatures of 300 to 350 deg. F., for use in anti-icing internally heated structures. To date, only one such compound, "duct supe," manufactured by Products Research Co. of Los Angeles, has appeared on the market as a sealant approaching the industry's requirements.

► **Hydraulics Program**—Particular interest attaches to AIA's nonflammable hydraulics program in that it ties in with the President's Air Safety Board recommendation for a safe fluid.

While it is true that various chemical and oil companies had under CAA test a variety of safety fluids last year, as reported to SAE at its National Aeronautics Conference in Los Angeles last fall, considerable variance existed between specifications conceived both by engineers of individual aircraft companies and by fluid manufacturers.

► **Toward Uniform Specs**—The present program shows a strong effort to gain a uniform set of specifications, acceptable to all segments of the industry.

While it would seem that the research group's work might lead to production of a single universal safety fluid, this evidently will not be the case. A committee survey of military and commercial users, and oil and chemical companies, indicates that as many as three grades might be indicated due to differences in hydraulic systems of various types of aircraft.

AMC Puts Dorrell In Charge of Sales

Aviation Maintenance Corp., Van Nuys, Calif., has appointed Vernon A. Dorrell to the newly-created position of general sales manager. He joined the company in 1947 as manager of the introduction and sales of Allison airborne radar.

Active in aviation since 1924, Dorrell was former vice-president in charge of operations for Mid-Continent Airlines and was at one time division operations manager of the Pan American Airways affiliate operating from Mexico City to

PAC'S ENLARGED BURBANK BASE

With the acquisition of four large buildings and more than 400,000 sq. ft. of tie down area, Pacific Airmotive Corp. claims the West Coast's largest service facility for commercial, executive and private aircraft. Service from washing to major overhaul is available. The new layout is directly across the street from PAC's recently-built $2,000,000 overhaul base.

Los Angeles and El Paso. He has also served as sales and development executive for Lockheed and Vultee Aircraft.

Dorrell recently headed his own firm of aviation consultants to companies in the United States and Central and South America.

In other personnel actions:

• **Wright Aeronautical Corp.** elected Henry P. Dolan treasurer. He succeeds C. C. King who retired. Dolan, controller at the time of his election, will continue in that post.

• **Aro Equipment Corp.** named Walter C. Leitch vice president and general manager. Leitch was formerly general sales manager for Gilbert & Barker Manufacturing Co., subsidiary of Standard Oil Co. of N. J.

• **General Electric Plastics Division** appointed **Charles H. Harris manager. Harris,** who has been assistant to the manager, joined the company in 1930.

• **Aerocar Associates,** Longview, Wash., has added Arthur Robertson to its engineering staff. Robertson, who was formerly with Lockheed Aviation Corp. as stress analyst in the engineering division, will work with Charles H. Kitchell, formerly with Taylorcraft.

• **Brown Instrument Co.** named O. B. Wilson industrial manager for the eastern sales region with headquarters in New York.

• **SKF Industries, Inc.** appointed Arthur S. Roberts as secretary and counsel. He succeeds Charles P. Collins who resigned Feb. 1.

• **Bendix Aviation Corp. Pacific Division** has named Ben Livers assistant chief hydraulic engineer. Previously Livers was chief engineer of Aireon Manufacturing Co.

• **Glenn L. Martin Co.,** appointed N. F. Vanderlipp, factory manager, reporting directly to G. T. Willey, vice president manufacturing. Vanderlipp was formerly general manager and board member of the Bellanca Aircraft Corp. Previously he was chief engineer in Fairchild's Canadian branch from 1936 until he accepted position as factory manager of Curtiss-Wright Airplane Div., Columbus, Ohio in 1943. The following year he was promoted to general manager of the Curtiss-Wright plant in Buffalo.

• **Boeing Airplane Co.** appointed Allen W. Jacobson, Seattle division department manager; and C. B. Gracey as factory service manager. Jacobson was formerly factory general superintendent and more recently general superintendent of experimental shops. In his new position he will be in direct charge of all experimental manufacturing activities. He has been with Boeing for seven years. Gracey, a 21 year veteran with Boeing, was formerly materiel manager. In his new position Gracey will direct the production, industrial engineering and materiel departments. Frank L. Dobbins, formerly assistant materiel manager, succeeds Gracey as materiel manager (he is a 19 year Boeing man). G. F. Brott has been appointed supervisor of the service publications section of Boeing's service dept. Brott succeeds E. F. Lewis, who has become acting assistant B-50A project engineer. L. D. Duerst former supervisor of the Stratocruiser training school has assumed Brott's duties as supervisor of the training section. W. E. Van Over, who has been one of the training school's instructors, has been named to Duerst's former post as school supervisor.

• **B. F. Goodrich Company** appointed John S. Gulledge, manager of the Chicago district of the Industrial Products Sales division to succeed Orno B. Roberts who has retired because of health. George W. Green was named manager of manufacturers' sales of industrial products in the Chicago district. Ernest E. Haupt succeeds Gulledge as Cincinnati district manager. Robert T. Kain, manager of district office in San Francisco, has been transferred to Dallas, Tex., as manager of that district; he succeeds David R. Anderson, assigned to special sales duties. H. B. Lane has been named manager of the San Francisco district.

BRIEFING PRODUCTION NEWS

► **Bell Aircraft Corp.** helicopter production is now at the rate of three a week. If an expected government order is received, output will be stepped up further. The company has produced 250 prime movers (motorized wheelbarrows) in the last two months and production rate is now 20 per day. Employment is now up to 2100, an increase of about 100 in the last six weeks. Latest major Bell helicopter sales include six model 47-D to the Argentine Navy and two to the Directorate General of Agriculture of Iraq.

► **Hamilton Standard division,** United Aircraft Corp. is now in production on a 16 ft. 6 in. hollow-steel propeller, the largest ever produced at the East Hartford plant It is the first reversible-pitch Hydromatic design using steel blades and is intended for the Boeing Stratocruiser. The first 36 of the 55 Stratocruisers now in production will use the giant propeller.

► **AiResearch Manufacturing Co.** has received additional contracts for heat transfer equipment for Boeing B-50 bombers. The equipment includes engine oil cooling systems and supercharger intercoolers for the 82 additional B-50 bombers recently ordered. AiResearch also is supplying a large quantity of electrical power equipment and complete cabin pressure instrumentation for the B-50.

► **Northrop Aircraft, Inc.** has received a commendation from Secretary of Labor Lewis B. Schwellenbach for its accident prevention program, rated one of the best among West Coast industrial plants.

► **Koppers Company, Inc.** has inaugurated a retirement benefit plan applicable to all hourly-paid employes who reach age 65 and have been with the company 15 years. The plan permits a retired employee to make as high as $900 annually from a combination of Social Security and company benefits.

► **Texas Engineering and Manufacturing Co.** has received a second order for airliner conversion work from the Avianca Company of Colombia. The new order calls for the conversion of four Douglas C-47 transports into passenger airline versions. The original order was for the conversion of seven C-47 transports. TEMCO has also delivered several reconditioned North American B-25 bombers to the government of Venezuela.

► **Rigid-Tex Corp.,** Buffalo, N. Y., is supplying sheet and strip metal in which decorative patterns have been rolled by a patented design-strengthening process for use in Convair B-36 and other large planes. The rigidizing process was developed by Richard S. Smith, company president. A 30 percent plant expansion is planned to handle the increased volume already on the books.

► **Goodyear Aircraft Corp.** has started production of aluminum bins for ice cube storage for the York Corp., York, Pa. The bins will be used as platform receptacles and storage containers for the York Automatic Ice Maker for hotels and restaurants. The bins are being fabricated in the huge airship dock at Akron, Ohio and will require about one year for completion.

► **Beech Aircraft Corp.** has moved up its Bonanza production to four a day but has decreased the model 18 executive transport output to one a week. Present employment is between 2,500 and 2,600, unchanged from a month ago.

Convair Election Results

Close to a year of union jurisdictional disputes may be ended at Consolidated Vultee Aircraft Corp. with International Association of Machinists the apparent victor over CIO's United Auto Workers by a narrow margin.

Results of a National Labor Relations Board election shows 3437 ballots for IAM and 3414 for UAW, with the CIO union protesting the results on numerous counts.

Should IAM, the company's union of contract, be re-certified, an immediate negotiation of a new contract, with the union undoubtedly seeking wage advances for its members, will be the next thing on the books.

Throughout the jurisdictional controversy Convair has been operating under terms of an IAM contract which expired in May 1947. Since then, pending the election just held, the company has operated under terms of the old contract.

Operator moves Reflectoscope's searching unit along rib section of propeller material, and marks locations of flaws on adjacent plate surface.

Supersonic Pulses Probe Metals To Hunt Flaws, Check Thickness

Internal defects in high-strength propeller steel quickly detected via high-frequency sound waves. Material also accurately gaged.

By **H. C. DRAKE**, *Director of Research*, and **E. W. MOORE**, *Technical Data Staff, Sperry Products, Inc.*

Results obtained in production testing at Curtiss-Wright's Propeller Division, using instruments generating ultrasonic waves indicate that this technique has a wide potential in the general field of aviation materials inspection.

These instruments—the Reflectoscope and Reflectogage—already used for quality control by various aircraft manufacturers and suppliers have been found applicable for testing steel, extruded aluminum and magnesium stock, aircraft spars, turbine wheel and impeller blanks, die stock, and many assorted forgings and castings.

With every advance in speed and weight requirements of aircraft, there is a corresponding advance in the quality of steel, aluminum alloys, and all other materials used in plane manufacture. Each stage of development brings a purge of former standards, quality control tightens up, and imperfections which were previously tolerated become suspect and grounds for rejecting an entire rolled steel plate or aluminum extrusion.

The Reflectoscope and Reflectogage—engineered and manufactured by Sperry Products, Inc.—are both used for routine testing and measuring at C-W's Propeller Division. The Reflectoscope is employed in one particular application to check for discontinuities in rolled alloy steel (modified SAE 4320), and the Reflectogage is used to check the wall thickness of all finished propeller blades.

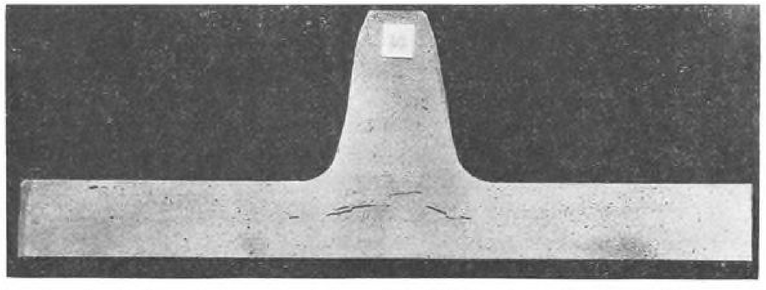
▶ **Theory of 'Scope**—The Reflectoscope's supersonic beam can be directed into solid materials in the same manner that high-frequency radar waves can be used for ranging and detecting objects in the air. Heavily directional, high-frequency vibrations, of the order of ½ to 5 mc., when projected into a solid will be reflected back by cracks, voids, inclusions, and opposite surfaces. Fine steels and aluminum alloys permit excellent supersonic penetration.

The instrument generates pulses of high-frequency electrical oscillations which are converted into pulses of supersonic energy by a crystal in the searching unit which is placed on the work. The generated beam is reflected back to the crystal by discontinuities in the material (or by opposite surface). An adjustable time-marking system (rectangular wave pattern) is integrated with the cathode ray spot of the oscilloscope to show increments of distance, either in inches or feet, depending on how the instrument is adjusted. (It detects flaws in steel and aluminum at depths as much as 22 to 25 ft.)

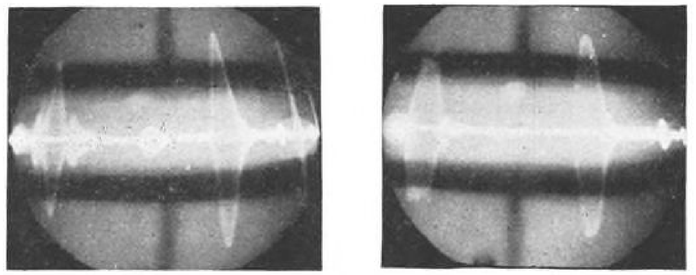
The time for the sound to travel and return as a supersonic "echo" from a defect or opposite surface is indicated by a deflection of the trace on the oscilloscope screen at a point corresponding to the particular time interval. Using the rectangular wave pattern as a scale, the operator takes his reading.

▶ **Metal Factors**—A daily use of the Reflectoscope in C-W's Propeller Division is to test the rib section of rolled steel plate employed in the fabrication of the world's largest steel propeller blades—used on the six pusher-type, R4360 engines of Consolidated Vultee's B-36. Propellers in this class are expected to withstand exceedingly high torsional and vibrational stresses, surface pressure, and temperature changes.

The 1129 blade (Curtiss designation) on a B-36 carries a centrifugal load of 239,000 lb. and will withstand a tip speed of over 1027 fps.—close to the speed of sound. The circle described by the three-blade propeller when spinning is 19 feet in diameter.



Section of rolled steel plate containing critical flakes detectable by Reflectoscope. Instrument would disclose that flakes are located too deep for removal by machining, thus permitting material rejection in early production stage.



Exact location of flaw in rib is indicated in photo record (left) of Reflectoscope test. Here, flake is 2⅛ in. from rib top. Right photo shows indication obtained in rib area free from flaws.

Because the strength-weight ratio of material is of paramount concern to propeller makers, Curtiss uses alloy steel which can be formed into a thin-walled, lightweight, hollow structure of considerable strength. The properties of this steel must be studied constantly, and the plates from which blade sections are fabricated are rolled and cooled according to rigid specifications to minimize occurrence of objectionable flaws. Both manufacturer and mill work together closely to improve this steel.

Early in the game, rolled steel plates were being rejected in large quantities and defective plates were discovered only after great cost in labor and milling operations had been incurred. For some time the useful portion of the stockpile of rolled steel plates was an uncertain quantity. This is by no means a reflection on the mill. Material rejected at the propeller plant would be considered, by most standards, fine grade steel.

A hollow, steel propeller blade is made in two sections, each of which starts into production as a flat steel plate. The main stages, stripped of dozens of intermediate steps, consist of milling, forming, welding, brazing, pressure die straightening, heat treatment, balancing, plating, and assembly.

What might normally be considered a minor internal flaw in a whole piece of rolled steel plate may constitute a very serious stress riser after the material is reduced to roughly 30% of its original size. Prior to the use of the Reflectoscope, each of these plates had to go through 33 operations before tests could be performed to assure that the plate was satisfactory blade material. Supersonic testing has eliminated this type of speculation.

► **'Scope Application**—The testing procedure is rapid and accurate. The rib surface is prepared on the grinding machine and the Reflectoscope calibration is checked in a test set-up. With the aid of a hoist, the 10-ft. plate is moved onto a flat where the operator tests the center rib in a matter of minutes. He first oils the rib surface to insure good crystal-to-surface contact, and moves the searching unit along its entire length while watching the oscilloscope screen for indications of defects.

Wall thickness readings at each blade station, as indicated by Reflectogage, are marked on surface to constitute a guide in the final polishing operation.

Whenever an indication appears, the depth of the flaw is noted in chalk on the plate at the base of the rib. A special scale is provided to help the operator determine if a discontinuity is located within the final pattern area of the plate or in a portion which is ultimately milled away.

Careful records are kept on all tested plates—both rejected and accepted. The history of each tested plate is traced back to the ingot from which it was rolled. Supersonic testing thus makes constant control of rough material possible and enables the quality control department to help the mill establish a cooling procedure which minimizes the amount of flaking encountered in rolled steel plate.

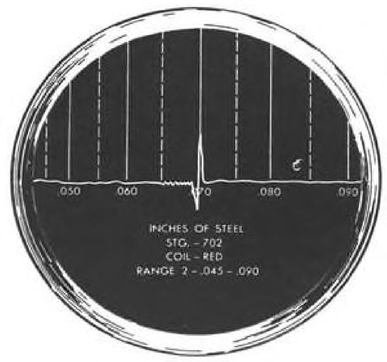
Earlier, only a surprisingly small percentage of plates was good enough to process. Accordingly, the Reflectoscope then was taken into the mill where it assisted greatly in determining the effectiveness of different processes that were tried. The mill continued to roll the steel and to improve methods of cooling as each new plate was Reflectoscope-tested and further data provided.

By noting the sizes of indications from each lot of freshly rolled plates, cooling procedure could be directed without interrupting work at the mill. Through factory-mill cooperation, the steel plate was refined to a point where a rejected plate is now the exception instead of the rule.

If the plate stands up under supersonic screening it is ready for milling and other operations. Tests are then made for surface defects. Finally, the blade sections are paired and welded together along the rib section and around the edge. The two sections, now combined as one, constitute a blade which, however, is still in a crude state. Brazing and various heat treatments such as normalizing, hardening, and tempering follow.

After the blade is shaped and polished, it undergoes a supersonic test for wall thickness using the Reflectogage. With this instrument, tests can be made in areas formerly inaccessible, and the blade is assured of performance within the stress limits as established. The slightest irregularity in a propeller subjects an airplane to excessive vibration when in flight.

► **'Gage Utility**—The Reflectogage generates supersonic energy and projects it into the material under test. Whereas the Reflectoscope reading is actually a measurement of the time elapsing between an initial supersonic pulse and the return of its "echo," the Reflectogage reading is derived from the frequency at which the material resonates.



Reflectogram of thickness indication as it appears on screen. Trace is deflected at point on calibrated scale corresponding with actual thickness (resonant frequency) of blade.

If the part under test has resonant frequencies within the tuning range of the instrument, there are at these frequencies momentary increases of energy to the cathode ray, through the searching unit. Each energy increase is indicated by a sharp deflection of the cathode-ray trace. A direct reading scale over the oscilloscope screen tells the operator the thickness of the piece under test rather than the material's resonance frequency. The instrument measures thickness of material ranging from .005 to .300 in. directly, and up to several inches indirectly.

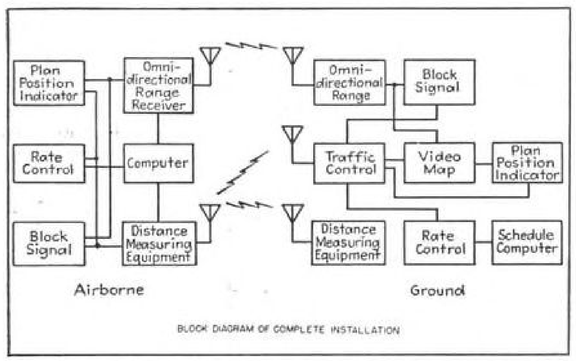
The device is portable, weighs only 40 lb. and can be moved to any corner of the plant to check blades rapidly and without interruption in production line procedure. The operator divides the polished blade into stations with chalk marks on the surface. He then measures the exact thickness of the blade wall at each station with the Reflectogage. The plus or minus difference between the specified thickness and actual thickness is noted on the surface station where the test was made. These markings serve as infallible guides in final polishing, for they indicate where the surface can or cannot afford to be ground.

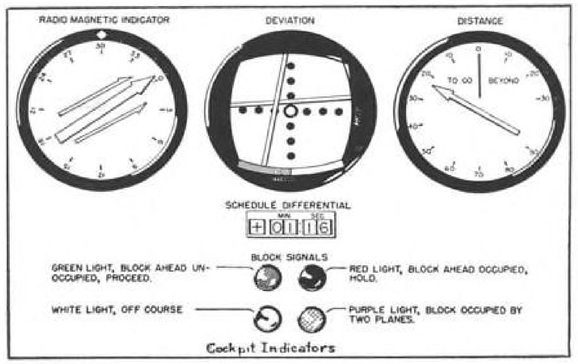
Veteran Employment

The trend of war veteran employment in the aircraft and aircraft parts industry is upward.

Veterans now comprise 31 percent of the payroll, compared with 28 percent a year ago, according to the U. S. Employment Service.

USES finds, also, that veterans are given preference in hiring, but that little use is made of the veteran on-the-job training program.





Proposals for improved air traffic control: Diagram at left is schematic representation of an installation for a late phase of the interim program, in which block control methods are used. Sketches shown at right and at bottom of page are suggested cockpit indicators which employ private-line visual communications for routine control maneuvers instead of voice communications now used.

Plan Boost In Air Traffic Control

Five-year interim program concerned mainly with electronic equipment. Target effort designed to handle 100,000 craft.

By ROBERT B. HOTZ

The Federal airways and air traffic control system, now operated by the Civil Aeronautics Administration at an annual cost of $38,892,000, can handle only 42 percent of its air traffic potential, according to the recent report of the Radio Technical Commission for Aeronautics, Special Committee No. 31.

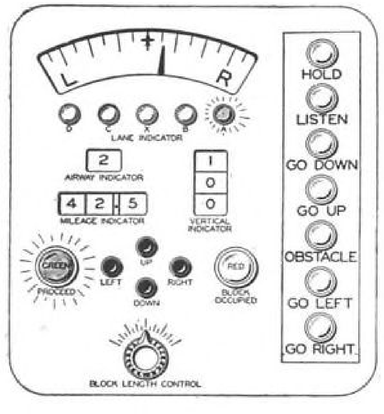
This system breaks down most seriously in its traffic control functions where the entire system is dependent on manual operations of traffic controllers and pilots position reports that are often inaccurate because of lack of precise navigation aids. At present, there is not a single piece of electronic equipment employed for air traffic control purposes.

► **$40,000,000 Loss**—This situation confronts the air transport industry with a circumstance roughly parallel to that of the automobile manufacturers in the era of unpaved, muddy roads. Not until it can operate over a system of modern, electronic, all-weather airways can air transport hope to offer the reliability and safety necessary to assure profitable operations. At present, inadequate airways and traffic control systems are costing the airlines at least $40,000,000 annually in lost revenues. More than half of these losses are caused by air traffic jams during bad weather.

Detailed documentation on how this system breaks down under high density, bad weather traffic is provided in the transcript of CAB hearings on the forced landing of an American Airlines DC-3 at Jones Beach, N. Y., and the crash, fatal to five, of a Nationwide Air Transport Service DC-3 near Millville, N. J. Both accidents occurred on the night of Jan. 5, 1947, under circumstances that badly over-saturated the navigation and traffic control facilities of the Washington-New York airways and produced 19 other emergencies during a four-hour period.

Military operations are also imperiled by the lack of modern traffic control facilities. The problem is particularly acute because of the high fuel consumption of jet engines, which does not permit tactical aircraft returning from long missions to mill around in a traffic pattern for any length of time. The jet planes need a method that will bring them onto the runway fast and accurately before their fuel is exhausted.

► **Interim Program**—First step in increasing efficiency of the Federal airways system is a five-year interim program of developing and installing electronic equipment already known. RTCA estimates that completion of this program will increase present airways capacity by 25 percent. Completion of the ultimate, or target, airways system (tentatively set as a 15-year program) will bring the airways up to 95 percent operational efficiency, according to RTCA. The target program is designed to handle a fleet of 100,000 aircraft, including 5,000 airline transports, for all-weather operations by 1963.



Interim program follows closely CAA's own blueprint for airways modernization and will utilize all of the funds appropriated for the CAA's program since the end of the war. Completion of this program will cost $376,200,000, RTCA estimates. Less than 2 percent of this sum will be for research. Although it is based primarily on improved very high frequency and microwave equipment, the interim program calls for a number of non-electronic improvements. Among these are:

- Clearance of obstructions in approach areas of instrument landing runways.
- Increased width of airport taxi strips and better entry for planes from taxiways to takeoff runway.
- Better airport design and more careful selection of sites with consideration of instrument landing requirements.
- Use of high intensity runway and approach lights.
- Fog dispersal equipment, where necessary.

There are also certain basic general requirements for both interim and target

systems. These include:

► **Single-Site Operation**—The system must be capable of set-up on a single site and provide navigation and traffic control to the limits of line of sight range. This requirement is principally military, arising from the need to operate the system from a carrier, a small island base or a beachhead. It necessitates using a system based on polar coordinates and rules out hyperbolic systems of navigation such as Loran, CCA, Tricon, etc., since they require multiple sites. It also eliminates all landing systems that require equipment placed far outside airport limits.

► **Flow Control**—A method of flow control is necessary to provide scheduled arrivals in crowded terminal areas and complicated traffic patterns.

Equipment specified for development and installation during the five-year interim program includes:

Navigation Equipment

► **Omni-Directional Range (VHF)**—Continuation of the CAA program of installing these facilities is recommended. However, it is pointed out that their accuracy should be improved and that eventually it will be necessary to replace the omni-range with more accurate equipment. Transition from low frequency, four-course, aural ranges to omni-ranges will be difficult without resiting some omni-ranges already installed. CAA already has sufficient funds to complete the omni-range program.

► **Equipment Interlocks**—Interlocking of equipment is a necessary safety factor. All airborne equipment must be monitored by ground equipment and vice versa. It is essential that pilot know the information available on the ground and ground traffic controllers have the same information available to pilot from navigational aids aloft. Ground traffic control systems must be interlocked so that errors in one system can be detected and corrected by another without disrupting the traffic flow.

► **Aircraft Identification**—This is required both for military identification of friendly planes and civil need to insure traffic control instructions are received and complied with by the proper plane.

► **Functional Equipment**—The system must get all traffic control information from ground equipment and all navigational information to be used in the plane from airborne equipment. This is a safety requirement to simplify the systems and prevent equipment errors from cancelling out space and time separations.

► **Closed-Circuit Principle**—Operation on the closed circuit principle insures that the system continuously reports that it is operating correctly.

► **VHF Navigation-Communication Receiver**—Initial deliveries of airline receivers of this type are expected soon. Military models are still in the service test stage with specifications for a production model scheduled for completion by next October. Biggest deficiency in this program is the lack of a lightweight receiver suitable for private planes. RTCA recommends a subsidy to induce radio manufacturers to attempt development of this equipment despite dubious prospects of a profitable market.

► **DME**—Distance measuring equipment is essential to use of the omni-range and instrument landing system. Two DME systems have been successfully demonstrated. Immediate problem is to determine specifications for production models. Next October should be final deadline for the specifications. Lack of distance information in present navigation aids is one of their most serious weaknesses. Additional consideration should be given to development of a lightweight DME and offset course computer for light private aircraft.

► **Course Computer**—Development of an offset course computer necessary for use of multiple airways and automatic flight operations in the omni-range system is in an advanced stage of development. RTCA recommends production of an interim model at the earliest date so full advantage of the omni-range facilities can be utilized.

► **Racon**—Use of ground radar beacons and airborne scope radar is not recommended as a primary navigation aid. Its use as a secondary aid will be pushed by the military with only small airline use anticipated. CAA plans to install Racon beacons on most of its omni-range sites.

Landing Systems

The complete instrument landing system during the interim program consists of five elements: VHF runway localizer; UHF glide path; precision beam radar (GCA); three 75-megacycle markers along the localizer course; and two low frequency compass locator stations installed at the middle and outer markers.

Traffic Control System

► **Search Radar**—Basic element in the traffic control system is a search radar with 40-mile radius to provide range and heading information on all aircraft in the approach zone with an accuracy of plus or minus one mile in azimuth and plus or minus one-half mile in range. Longer ranged search radar (125-mile radius) is now being operated experimentally at New York and Washington for monitoring traffic control procedures. The air force all-weather flying center has developed a radar traffic control system (CPN-18) that is now being used for all traffic control functions at Andrews Field, Md. and Wilmington, Ohio. These search radars should be equipped with a moving target indicator that eliminates ground clutter from stationary targets and fast-phase timing that reduces the adverse effects of rain on scope pictures. Radar scopes should be equipped for daylight operations in airport towers and traffic control centers. Video-map features including marker beacons, range courses, runways, etc., should be included in scope presentations.

► **Airborne Transporters**—Airborne radar beacons are available now for simple aircraft identification but more development is needed on equipment that will also provide coded altitude information automatically when interrogated by secondary ground radar. This will be necessary in achieving high density traffic control.

► **VHF/ADF**—Automatic VHF direction finding equipment should be presented on search radar scopes used for traffic control. When aircraft transmit on a given VHF channel a pencil of light on the radar scope points to the blip of the transmitting plane, giving positive identification.

Communications

► **VHF-UHF**—Ground facilities are now completely equipped with static free VHF radio equipment. Full benefit from the program is not being received because of the lack of airborne equipment.

► **Long Distance Interphone Circuits**—Expansion of the private line long distance telephone circuits linking airways traffic control centers is essential to accelerated flow of airways traffic.

► **Private Line Air-Ground**—To ease the present serious overcrowding of voice communications facilities on air ground channels a system for automatic visual relay of messages should be developed. This system would handle all routine communications such as holding instructions, landing clearances, taxi instructions, etc. This system is essential in the target system and should be developed as soon as possible under the interim program.

With the possible exception of the automatic VHF direction finding equipment it may be possible to utilize all of the components of the interim system or improved versions thereof in the final target system. RTCA emphasizes, however, that considerable simplification of equipment should result in the target program. The real goal is a carefully planned system that accomplishes maximum results with a minimum of equipment rather than an accumulation of gadgets.

(The second article, to appear in a subsequent issue, will discuss equipment requirements of the target system.)

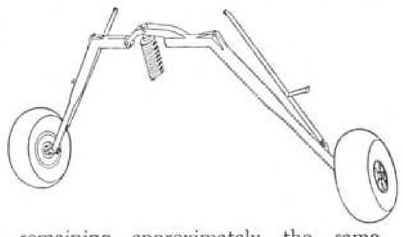
Landing Gear Designed To Give Softer Let-Down

A new landing gear—now supplied as standard equipment for the Luscombe two-place Silvaire—provides three points of shock absorption to afford softer let-down.

Designated "Silflex," the gear comprises a flexible tubular steel leg with a combination coil spring oleo unit similar to the "floating ride" principal of the automotive industry.

This affords the simplicity of a spring-type gear with the light weight and shock absorption of an oleo gear. A plain spring, it is claimed, does not absorb a shock, but merely changes the direction of the energy, and must rely on side-friction of tires against the ground for whatever snubbing action is obtained. In the Silflex design, snubbing action is provided by the oleo, giving increased shock absorption and reduced tire wear.

The new unit has been developed from the former gear on the Silvaire and is considered more rugged. There are over 17 percent fewer parts, and the tread is four inches wider, weight



remaining approximately the same. Essential differences between the new and old designs include (1) Replacement of the old 1½-in. tubular steel leg and tie-rod truss structure with a full cantilever heat-treated chrome molybdenum alloy tubular steel leg tapering from 2¾ in. at the top to 1½ in. at the bottom, and (2) redesigned hydraulic unit featuring a piston head giving better control of oil flow and improved, more uniform shock absorption. Chevron-type packing has been changed to the latest O-ring type.

Other design changes made to simplify production include substitution of a steel forging for a built-up welded structure, and a switch to tubing with a close-tolerance inside diameter for fabrication of the cylinder.

Before final adoption, the landing gear was subjected to extensive testing on two aircraft, encompassing stresses not normally encountered in everyday flying. It is stated that ground tests revealed marked resistance to ground looping. Even when intentionally ground-looped at high speeds on both turf and concrete, the gear maintained the airplane on level keel.

Research Review:

NACA Cites Many Attainments In Year of Intensive Research

Significant advances are made in aerodynamics, propulsion and structures. Report notes headway against operating problems. Theory gets new accent.

Experimental progress in aerodynamics, propulsion and airframe construction has been disclosed by the National Advisory Committee for Aeronautics in its 23rd Annual Report, covering results of research in fiscal 1947. Gains were also made on the operating-problem front, and especially noted was an increased emphasis on theoretical work.

With almost the whole of modern aerodynamic theory of foreign origin, the NACA is conducting an intensive program in supersonic aerodynamic theory—first, to solve these problems in the absence of any further foreign contributions; second, to make the U. S. the leader in the supersonic field that Europe was in the subsonic field.

Aerodynamics

► **Airfoils**—Studies of the effects of surface conditions on high-speed airfoils revealed that these are at least as large as the effects of airfoil shape. Spar joints, de-icer boots, or surface unfairness occurring in regions of normally laminar flow can produce section drag coefficients twice as great as those for smooth basic foils. An important result of the year was development of the NACA 6A-series airfoils, which eliminated the trailing edge cusp of the 6-series foils without affecting their aerodynamic characteristics.

► **High-Lift Devices**—A continuing program was the effect of Reynolds number (scale effect) on the maximum lift coefficient of various flap configurations. Generally, low Reynolds numbers increase the maximum lift coefficient of given flap configurations, but an increase in Reynolds number (augmenting size/speed of plane) decreases these values.

► **Wing Characteristics** – Effect of Reynolds number on swept wings showed substantially the same phenomenon—i.e., sweep at low Reynolds number increases the maximum lift coefficient over that of the unswept wing, while at high Reynolds number the reverse is true. A significant result was obtained in an investigation of split and double-slotted flaps on thin wings. One configuration tested disclosed an increase of 105 percent in maximum lift coefficient with full-span flaps deflected.

► **Boundary Layer**—The year witnessed increased attention to the potentialities of boundary layer control for increasing lift and reducing drag. One notable test of an airfoil with leading edge slat, double-slotted flap, and boundary layer suction at 0.40 chord produced a maximum lift coefficient of 3.86, a phenomenal value. It was shown that maximum lift on thick airfoils is gained by location of the suction slot at the rear, whereas the slot must be located along the forward portion of thin airfoils due to separation in this area as the maximum-lift angle is approached.

► **Aerodynamic Loads**—Results of load measurements on the Bell XS-1 up to Mach 0.8 show: Good agreement with wind tunnel predictions, no appreciable movement of the center-of-pressure, and a maximum-lift buffet boundary of the same general shape as that determined on the North American P-51D Mustang. Load data at higher Mach numbers has not been reported. Accurate theoretical methods for computing the loads on sweptback wings are now available, and extensive theoretical work on the subject of air loadings and pressure distribution was accomplished. In addition, flight investigations have been carried out on the P-51D and the Lockheed YP-80A Shooting Star jet fighter, showing good agreement with theory.

Gust loading received considerable attention, with studies extended from consideration of the airplane as a rigid body to its consideration as an elastic body, with effects of structural elasticity in gusts included in theoretical calculations. Air loads on tails showed numerous phenomena not heretofore thoroughly understood, emphasizing the importance of tail smoothness, the difference in phase between fin and rudder, vertical tail loads in rolling pull-outs, and the increase in normal tail load created by buffeting.

► **High-Speed Wings and Bodies**—Tests, at high speed, of thin, sharp leading edge airfoils disclosed that subsonic drag of such types is greater than with foils having rounded leading edges. Trials with double-wedge airfoils indicate that under some conditions sweepback outside the Mach cone actually increased the lift-drag ratio. Although it has been known that double-wedge foils have the lowest drag at supersonic speed, if skin friction be neglected, skin friction tests of biconvex airfoils revealed increased laminar flow and therefore lower viscous drag and lower total drag at certain combinations of Reynolds number and Mach number.

Work on the effect of aspect ratio on supersonic wave drag showed that increasing aspect ratio produces decreased drag, provided the sweep is well within the Mach cone. An unusual finding was that, neglecting friction, supersonic biplane wings actually have greater lift-drag ratios than monoplane wings. Also, an important result was obtained in the measurement of wing-body interference by the free-fall method. Here, a means was developed for shaping the surface of the body at the juncture with the wing so that interference is greatly reduced.

► **Aerodynamic Heating**—A method was worked out for determining the cooling requirements in the region of the boundary layer of a fighter or guided-missile body. This was applied to a typical form, and results indicate that the body length for a completely laminar boundary layer is about 50 ft. at Mach 3.0 and at an altitude of about 100,000 ft. Another prime result was discovery that heat transfer through the boundary layer has a marked effect on its stability during small disturbances. It was found that removal of heat from wing or fuselage increases stability of the boundary layer.

From this study it was discovered that at Mach numbers greater than 3.0 the heat drawn from the airflow balances the heat radiated from the surface and the boundary layer flow is completely stable at all Reynolds numbers.

► **Longitudinal Stability**—A study of the downwash behind swept wings indicated that maximum rate of change of downwash with angle of attack occurs in the regions normally occupied by the horizontal tail, pointing toward a lowering of the tail location or a lengthening of the fuselage plus wing sweep. Tests indicate that a combination comprising leading edge flaps over the outer portion and trailing edge flaps over the inner portion of a swept wing produces a reasonable maximum lift coefficient and longitudinally stable characteristics at the stall.

► **Flying Qualities**—Experience with the Bell XS-1 up to Mach 0.8 showed that stick-fixed and stick-free static longitudinal stability was slightly positive up to the maximum speed tested. The variation of elevator angle and elevator force with normal acceleration in turns and pull-ups was satisfactorily stable,

and static directional stability was high at all speeds. All controls were effective up to the highest test speed. Tests with the Douglas D-558-I plane are now being conducted and results evaluated.

Results of a general investigation of servo-mechanisms indicate that satisfactory control of large aircraft at subsonic speed, and of smaller aircraft operating in the transonic speed range, may be obtained with a control booster which produces a control surface velocity proportional to the error in position between the control surface and stick.

► **Spinning**—The design requirements for airplane tail surfaces to provide effective control for satisfactory recovery from fully developed spins of light personal planes have been determined, with empirical relationships established between the tail design parameter, relative density, and relative mass distribution of the craft. Studies of elevator hinge moments in spins disclosed that elevators may have a strong up-floating tendency due to the high angle of attack of the spinning attitude, resulting in increased push forces being required for all elevator deflections.

► **Air Inlets**—An empirical design method has been developed whereby satisfactory wing leading-edge air intakes may be developed. A study of side inlets resulted in a fully submerged inlet with a cascade of airfoils inclined to the airstream to turn the entering air. Attention was also paid to the subsonic characteristics of nose inlets designed for supersonic speed, and the investigation included study of two sharp-edge supersonic inlets with conical central bodies.

For supersonic speed, the importance of preventing compression shocks from forming ahead of the inlet was established. Studies were continued on the use of spike diffusers, which provide external compression of the supersonic stream thereby avoiding starting limitations of the conventional convergent-divergent diffuser.

► **Vibration and Flutter**—Research showed that when the torsion axis of an airfoil is ahead of the quarter-chord point, the amplitude of vibrations is generally not large, but when the torsion axis is behind that point dangerous amplitudes may occur. It was also found that a turbine fan blade will have its maximum flutter speed when the aerodynamic center of pressure coincides with the blade-section center of gravity.

These tests indicate that the greatest danger of turbine blade flutter occurs at the Mach number at which the local velocity on the upper blade surface becomes sonic. When the speed is increased beyond the critical Mach number, the flutter disappears.

► **Propellers**—Charts for the selection of an efficient propeller for light planes cover the range of power from 50 to 300 hp. airspeeds from 50 to 200 mph., propeller dia. from 6 to 10 ft., and blade number from 2 to 8 for a wide range of propeller rotational speeds.

► **Helicopters**—Flight tests indicate that rotorblade stalling materially reduces rotor efficiency prior to reaching the operating limitations due to vibration and loss of control. An important conclusion was that calculation of the operating conditions corresponding to an angle of attack of the retreating blade tip of approximately 12 deg. is useful in determining the conditions for optimum performance. Wind tunnel investigations indicate that large savings in flight power result from use of smooth rotor blades and additional savings can be gained from operation at lower rotational speeds.

► **Seaplanes**—Research indicates that increased length-beam ratios decrease drag, do not affect stability, reduce structural weight, and improve range, speed, and payload of seaplanes. Impact studies revealed that the second and subsequent impacts frequently impose greater loads than does the first impact, heretofore regarded as the most serious. A long afterbody materially reduces the maximum impact loads encountered during landing.

Propulsion

► **Power Plants**—Investigation has been made of a rectangular ramjet engine designed for installation in an aircraft wing. Experiments are being conducted on the use of internal films for the cooling of rocket engines. A study of the effect of exhaust pressure on a reciprocating engine showed only a small effect on cylinder temperature and heat rejection when manifold pressure was held constant, but an appreciable increase in cylinder temperature when engine charge air was held constant. Studies of turbine and compressor stresses and vibration showed that critical stresses in the rim could be relieved by relatively small changes in temperature distribution. An experimental investigation disclosed that turbine disks consisting of a central region of carbon steel and a rim region of high-temperature alloy aggravates the rim-cracking problem due to the difference in coefficients of expansion.

► **Fuels and Lubricants**—Work has been initiated on the development of a fuel-rating rocket engine for use as a research tool for determining relative performance of various rocket propellants. An investigation of high energy fuels is under way looking toward reduction of volume and, therefore, fuel storage space within high-speed aircraft. An investigation of low-volatility ("safety") fuels indicates that for cold starting an auxiliary fuel of a higher volatility must be used to facilitate this procedure.

► **Compressors**—An investigation of three blade curvatures indicates that an elliptical curvature produces the highest peak adiabatic efficiency for tip speeds below 1400 fps., a parabolic blade highest efficiency at speeds of 1400 and 1600 fps., and a circular curvature the highest efficiency at 1500 fps. Fact that the operating range of a compressor lies between a maximum flow producing sonic velocity and a minimum flow producing surge led to development of a surge inhibiter that recirculates air from the compressor discharge to the inlet. This device increased the peak efficiency 5 percent and the peak pressure ratio 17 percent, also increased the stable operating range of the compressor. A lengthy study produced data showing maximum operating Mach number of subsonic axial flow compressor blades of various shapes, thereby permitting design for maximum-stage pressure rise without decrease in efficiency due to compressibility effects.

► **Turbines**—Basic data is being obtained on the effect of Mach number on turbine design through observation of performance variation over a range of pressure ratios across the turbine and Reynolds number through variations in the turbine-inlet pressure or temperature, or both.

► **Combustion**—Research indicates that turbine entrance conditions are dependent on combustion chamber exit conditions, the pressure drop through the combustor should be low, the temperature and velocity profiles at the combustor outlet should be even, and afterburning should be kept to a minimum. Because air turbulence is an important factor in achieving efficient and stable combustion at unusually high rates of energy release, the effect of turbulence on combustion has been receiving further intensive experimental study.

► **Jet Propeller**—A study of a propeller powered by gas jets issuing from the blade tips indicates that the device would be considerable lighter than the conventional reciprocating engine with propeller. Fuel consumption, however, would be several times as great. Application of the device depends on simplicity and weight saving which would compensate for the high fuel consumption.

Airframe Construction

► **Structural Design**—Because wings of high-speed aircraft are subject not only to strength requirements but also to certain stiffness requirements which affect flutter speed, aileron effectiveness, divergence speed, and other characteristics, refined stress theories have been evolved to permit more accurate determination of wing stiffness. For thin wings, methods have been developed for the design of multiweb wings without intermediate stiffening for 24ST, 75ST, and O-1HTA magnesium alloy. Improved buckling theories relative to thick skins were developed. Although previous methods for determining the coupled modes and frequencies of aircraft structures are applicable only to straight wings, a new system has been evolved, through use of the energy method in conjunction with power series, which covers both the unswept and swept cases.

Continuing the study of sandwich materials, a theory for small bending and stretching of sandwich shells, including the effect of transverse shear deformation, was produced. The extensive program of experimental tests and theoretical studies in skin-stiffened panels, diagonal tension in beam webs, stiffened shells and box beams, was broadened, with important results.

► **Aircraft Metals**—Most of NACA's metal research is conducted by universities under contract. Included are studies concerning magnesium-cerium forging alloys, effects of corrosion, and fracture of metals.

► **Nonmetallic Aircraft Materials**—Research results were obtained on the fundamentals of adhesion-adherent systems, effects of temperature on strength properties of laminated plastics, and mechanical properties of ten different resins for use in sandwich materials.

Operating Problems

► **Ditching**—As a continuation of the wartime research program, several of the large transport craft planned or in use by the airlines are under study to determine their ditching characteristics. Dynamically similar scale models are either dropped into one of the towing tanks or projected into water from an outdoor catapult at equivalent airspeeds and attitudes.

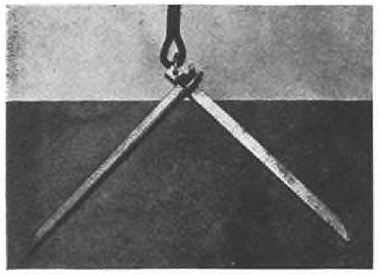
► **Handling Qualities**—In cooperation with the airlines, NACA has been investigating the flying and handling characteristics of transport craft, and the program thus far has indicated that present flying and handling requirements are necessary to insure safe and easy operation with the various blind landing systems. This program has emphasized the importance of minimizing friction in the control system.

► **De-Icing**—Results of the extensive program in flight and wind tunnel research on icing problems have proved highly satisfactory, with completion of of a second season of all-weather operations in a specially-equipped Curtiss C-46 Commando transport. In addition, broad theoretical results have been obtained, enabling accurate calculation of complete de-icing system requirements for any plane.

NEW AVIATION PRODUCTS

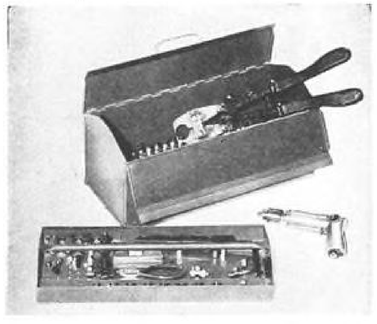
Lightplane Tie-downs

Described as inexpensive and effective private craft tie-down facility, kit of three paired stakes is offered by **Engineering Enterprises,** 525 South Ardmore Ave., Los Angeles, Calif. Principle of stake is that its two parts are driven into ground separately, interlock at 90 deg. to withstand considerable force, and can only be pulled out by plane as unit. When pilot removes stake, he withdraws parts individually. Weight of complete kit is about 5 lb.



Metal Working Kit

Specially assembled aircraft sheet metal kit, devised to cut servicing time on all-metal planes, is introduced by **Aircraft Tools, Inc.,** 2306 E. 38th St., of Los Angeles, Calif. Package contains 202 tools, compactly cased in sturdy, portable box. Small tools used with set combination of accessories are in canvas kits with pockets for accessories. Included are such units as flex shaft with angle drill head for close quarter drilling, combination square, drill adapters, micro-stop countersinks, skin clamps, speed driver kit, Cleco air hammer, Chicago pneumatic air drill with Jacobs chuck, full range of rivet sets, bucking bars, assortment of cutters and hole saws, hand rivet squeezer sets, cup squeezer sets, junior spot facers, drill-out tools, Lufkin tape measure, and box with tray drills.

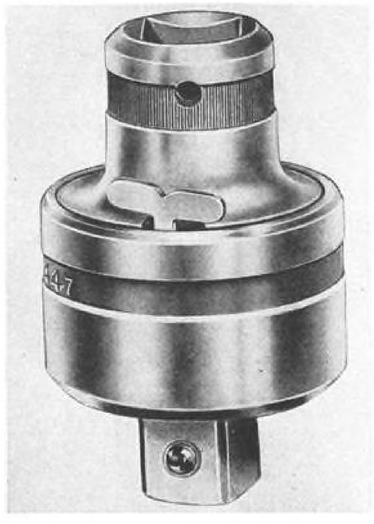


Cleaning Solvent

New cold cleaner for removing gums, dirt, grease, and carbon from metal parts is announced by **Maplewood Products Co.,** St. Louis, Mo. Named Gumco "Metal Brite" Parts Cleaner, it is claimed to have fast action requiring little agitation even in severe cases.

Socket Wrench Attachment

Designed to convert any ½-in. drive socket wrench handle or attachment into a ratcheting device, is new Ratchetor announced by **Plomb Tool Co.,** Los Angeles 54, Calif. Designated as No. 5447, tool has ½-in. square plug with ball-check for holding socket wrench, also ½-in. square opening for insertion of handle or attachment, and a reversible ratcheting mechanism. Intended primarily for use with hinge handle, hinge handle plus extension, a speed handle, or a torque wrench, it may be used with other non-ratcheting handles. Ratchet teeth give positive engagement every 10½ deg.

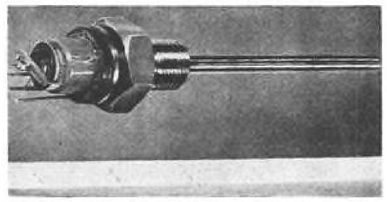


Liquid Adhesives

Two new modified phenolic liquid adhesives designed for cementing metals, thermosetting plastics, wood, fabric, or any combination of these, have been developed by **General Electric Chemical Dept.,** Pittsfield, Mass. Designated as Nos. 12507 and 12508, these agents, when properly cured, are described as exhibiting high shear and tensile strength and exceptional resistance to water, gasoline, kerosene, and mineral oils. Particular uses are in cementing metals and laminates, preparing metal-faced sandwich-type construction, attaching brackets and lugs to thin metal sheets, and for airplane fuselage walls. No sanding of plastics is required when using these adhesives.

For Temperature Data

Intended for telemetering applications where space is limited, lightweight temperature transducer but 1 in. in diameter is offered by **G. M. Giannini & Co., Inc.,** 285 W. Colorado St., Pasadena 1, Calif. Change in position



of temperature-sensitive bi-metallic element rotating standard microtorque potentiometer produces voltage outputs large enough for recording with oscillographs, galvanometer-recorders, and telemetering systems. In typical aviation application, device supplies ambient temperature at altitude to telemetering transmitter for reception and recording on ground. Resistances are available from 100 to 20,000 ohms. Designed for temperature ranges between −65 to 150 deg. C., unit has linearity of 1%, accuracy of 1%, and sensitivity of 1 deg. C. or less. Standard response time is 2 sec. for 5-deg. temperature change.

Calculating Chart

To reduce mental work of draftsmen and machinists, **H. M. Edmunds Co.,** 6 East 39th St., New York, N. Y., is offering Rapidadd Chart. Device is used for quick additions and subtractions of fractions. It has no moving parts. Fractions to be added are selected on two edges of chart, then by following diagonal line from intersection of horizontal and vertical lines answer appears on bottom scale if less than unity; on top scale if greater than unity. To subtract, procedure is reversed.

FINANCIAL

Aircraft Stocks Gain Over 1947; Upswing Shows Selective Pattern

While equities of all leading companies have passed last year's lows, only a few have exceeded former peaks.

Current recovery in the market values of aircraft equities reveals a highly selective pattern.

All issues have made substantial gains over low points established during 1947. This is indicated in the accompanying table showing the market action of the common stocks of 17 major aircraft and aircraft equipment companies.

In only a few instances, however, have recoveries surpassed the peak prices recorded during 1947.

▶ **Best Performer**—Grumman has proven to be the best performer by far among the aircrafts. The company's common stock, of which 500,000 shares are outstanding, has more than doubled in price from the low point of last year and is about 45 percent above its best 1947 market showing. It is probable that this is a reflection of the company's consistent past earnings and the favorable future outlook. As a basic supplier of aircraft to the Navy, Grumman has sufficient business on hand to maintain satisfactory operations over the immediate future.

The common equity of United Aircraft Corp, is up some 30 percent in price over 1947. This integrated aircraft unit has been noted for the stability of its operations, hence the relative narrow fluctuation recorded during 1947.

The equity of Fairchild Engine and Airplane, percentage-wise, has demonstrated a very important market gain. The common stock has more than doubled in value since the 1947 low and is up about 23 percent from its best showing of last year. Some observers believe that the company's participation in the NEPA project may have been a factor.

Boeing completes the quartet of companies whose equities have shown market appreciation over best 1947 quotations. In this instance, the improvement is only 13 percent. In view of the large military backlog and its relatively favorable commercial transport development, Boeing has attracted a respectable market following.

Bell and Sperry have come close to their best 1947 showings, but are up from 50 to 70 percent over their low points of last year.

▶ **Variations**—There are wide variations among the fluctuations of the entire list. For example, of the remaining issues still some distance from their 1947 peaks, the depreciation range from 7 to 51 percent. Ryan is only 7 percent from its 1947 peak, while Martin is some 51 percent away.

The difficulties centering around the transport development of Martin are well known by now and are probably responsible for this market behavior. The Ryan action is of very recent origin and is a reflection of the accumulated orders for parts received from other aircraft builders. Also, the company's surprise declaration of a 10 cents per share dividend was not without its market effect.

The units commonly associated with the accessory phase of the aircraft business, have not performed much better, marketwise, than the airframe builders. For example, Sperry, which has the best record in this category, is almost at its best 1947 price and about 50 percent up from the low point. Bendix and Thompson Products, however, have almost similar market action, being 28 and 22 percent, respectively, away from their best prices of last year.

It is not generally realized, but the character of Sperry, Bendix, and Thompson Products has changed considerable. They can no longer be considered as exclusive aircraft accessory suppliers. Sperry, for instance, never was completely dependent upon the aircraft industry but somehow has always been classified in this category. The company has long had a strong position in maritime navigation instruments. Both Bendix and Thompson Products have since their inception been vitally concerned as suppliers to the automotive industry.

▶ **Policy Reports Effects**—The recent flurry in aviation securities received their first impetus with the release of the report of the President's Air Policy Commission early in January. After a brief rest period, aircraft securities received another shot in the arm at the time of the release of the report of the Congressional Aviation Policy Board on March 1. Implications of substantially increased aircraft appropriations were read into this report and more market ammunition was available.

Realistic quarters, however, have persistently cautioned against the likelihood of substantially increased aircraft appropriations being voted in an election year when strong influences would like to effect a cut in the size of the national budget and also reduce taxes. This has been a dampening influence on aircraft shares from time to time.

Nevertheless, the troubled international picture has driven home the realization that regardless of unbalanced budgets, increased aircraft appropriations will be forthcoming. It is this factor which appears to be currently sustaining the strength in aircraft shares.

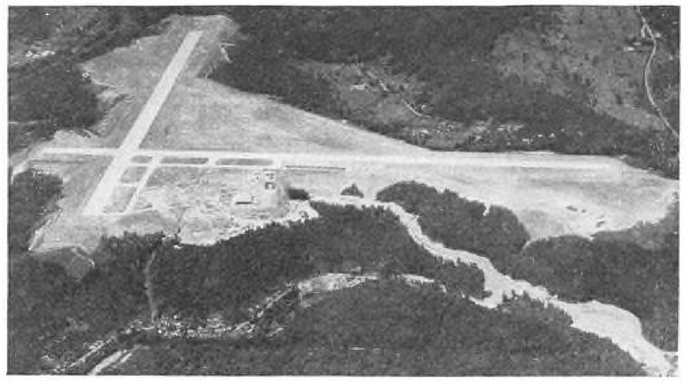
There is little doubt that if the aircraft industry, as a whole, is to enjoy profitable operations during 1949 and beyond, increased appropriations for aircraft procurement must be voted at the current session of Congress.

As in the past the participation of the separate aircraft units in the composite earnings pie will differ widely. This is the key to the highly selective pattern which prevails. The leaders in the postwar rallies did not decline in the same pattern in the subsequent price deflation. The recent upswing again showed a different composition of companies and further changes are probable before the present cycle is completed.

—Selig Altschul

CURRENT MARKET RECOVERY
Leading Aircraft Equities

Company	1947 Low	1947 High	Price March 10 1948	% Change From 1947 High
Beech	5⅝	12	10¾	—10%
Bell	10⅞	18⅛	18	
Bendix	17¾	39½	28½	—28
Boeing	14⅛	23⅛	26½	13
Convair	10½	17⅞	14¾	—17
Curtiss-Wright	4¾	6⅝	5¼	—17
Douglas	50½	76	58½	—23
Fairchild E & A	2	3¾	4⅝	23
Grumman	17	27⅜	39⅜	45
Lockheed	10⅝	20	18½	— 7
Martin	14	34	18⅝	—51
No. American	6⅝	13¾	11½	— 9
Republic	4⅜	9⅞	9⅛	— 8
Ryan	3½	6⅞	6⅜	— 7
Sperry	16¾	24⅝	24	
Thompson Products	38	59½	46¼	—22
United Aircraft	16⅞	21⅛	27½	30



AIRPORT ENGINEERING UNDER HANDICAPS

Kanawha Airport, Charleston, W. Va., which opened Dec. 1, 1947 to airline operations by American, Eastern, Capital and All-American Aviation lines, involved the enormous engineering task of moving more than 9,000,000 cu. yds, of earth and rock. Piedmont Aviation was also scheduled to start operations soon at the field. Every square foot of the airport surface involving runway and administration areas was artificially created with expenditure of more than $6,000,000. Another $1,500,000 will be needed for completion of a third runway and other construction. Kanawha Airport has been under construction since 1939, is probably the most unique airport engineering project in the U. S.

New CAA Airport Standards In Proposed Manual Revisions

Changes planned are to shorten Class I runways to 1500 ft. minimum and revise airport approach zone requirements to conform to ICAO.

By ALEXANDER McSURELY

Important changes in CAA airport standards soon will be forthcoming. These will be in revisions of the CAA airport design manual previously published in 1944 and in design manuals for airport pavements.

Tentative revisions being circulated for comment would virtually eliminate the sub-I class airport by relaxing standards for the small private flyer field. One-airstrip airports are recognized and runways as short as 1500 ft., instead of the 1800 ft. previous minimum for Class I are considered adequate.

Still in process is the section of the new manual dealing with airport approach zone standards.

National Association of State Aviation Officials, which has been discussing the proposed changes with CAA, says the airport approach zone standards are to conform as nearly as possible with the standards adopted by International Civil Aviation Organization. In general, diameter of the turning zone has been reduced for Class III and smaller airports. A drawing indicates a 1:20 approach slope for Class I and Class II fields and a 1:40 slope for larger fields.

► **Zoning Changes**—NASAO points out that the forthcoming change in approach zoning will necessitate changes in state zoning laws and municipal ordinances, although local governmental units were not consulted in preparation of the ICAO standards.

Paving manual standards generally will conform to the runway strength and dimension standards set out last fall in a CAA technical order for air carrier operations. These also conform to the ICAO proposed international standards, except in case of landing strip width. They provided for a maximum loading per wheel of 100,000 lb. for the heaviest runways, or 125,000 lb. for dual-wheel landing gear. The double wheel tandem gear such as is used on the Consolidated Vultee B-36 and XC-99 is taken into consideration by a note which says "where gross weight of aircraft with dual-wheels will be more than double dual-wheel pavement loading, the excess load will be transmitted to the pavement by additional units."

► **Stronger Taxiways**—CAA runway engineers say that new paving requirements still in process of development probably will ease up slightly on strength requirements of runways themselves, due to experience thus far with large planes. But they likely will increase strength requirements for taxiways and aprons. Current requirements in some cases have been insufficient when traffic was heavier than expected.

Runway lengths the technical order sets at from 3500 ft. minimum for feeder airports, to 8400 ft. minimum for international express airports are listed for sea level elevation and standard sea level temperature of 59 deg. F. Runway lengths are to be increased, however, at the rate of 7 percent of the length shown on the table for each 1000 ft. of elevation above sea level. This corrected length is to be further increased by one half of 1 percent for each degree by which the mean temperature of the hottest month of the year, averaged over a period of years, exceeds the standard 59 degree temperature.

To illustrate: a runway for a feederline airport which had a 1000 ft. elevation and a mean temperature of 79 deg. for its hottest month of the year would have to have added, to the standard 3500 ft. length, 245 ft. for the 1000 ft. altitude and 350 ft. for the extra 20 deg. of temperature. The total runway length under such altitude and temperature conditions would be 4095 ft. instead of 3500 ft.

► **Grade Requirement**—There is still another requirement that the runway length shall be increased to correct for runway gradient. This would be at the rate of 20 percent of the length corrected for altitude and temperature, for each 1 percent of effective runway gradient. The effective runway gradient is determined by dividing the maximum difference in runway centerline elevation by the total length of the runway. The maximum grade of any portion of the runway shall not exceed 1½ percent, effective gradient 1 percent.

The new runway lengths tentatively prescribed call for 1500 to 2300 ft. for Class I fields; 2300 to 3500 ft. for Class II fields; 3500 ft. for feeder airports, 4200 for local airports; 5000 for express airports; 5000 ft. FPR "deluxe" airports; 7000 ft. for international airports, and 8400 ft. for international express airports.

More Civilian Planes Registered in 1947

An increase of 13,819 civil aircraft in the United States during 1947 is shown in the latest tabulation of CAA.

Total of 94,821 civil aircraft was registered on Jan. 1 of this year compared with 81,002 a year ago. California continues as the private flying leader with 10,221 planes. Texas is second with 8347. Vermont has the fewest with only 187, ranking just below Rhode Island's 199. Helicopters showed an increase of 78 during the year with 130 now registered.

Tabulation of civil aircraft registered by counties can be obtained from CAA headquarters, Washington 25, D. C.

Breakdown of registered civil aircraft by states follows:

	Jan. 1, 1948	Jan. 1, 1947
Ala.	998	908
Ariz.	1164	885
Ark.	1078	899
Calif.	10,221	8456
Col.	1313	1088
Conn.	755	635
Del.	247	215
D. C.	933	986
Fla.	2907	2572
Ga.	1538	1346
Ida.	718	545
Ill.	4503	3705
Ind.	2718	2269
Ia.	2190	1734
Kans.	2719	2410
Ky.	835	686
La.	984	760
Me.	605	491
Md.	1184	1468
Mass.	1454	1255
Mich.	4695	3779
Minn.	2073	1798
Miss.	720	612
Mo.	2404	2171
Mont.	845	656
Nebr.	1534	1139
Nev.	422	383
N. H.	304	244
N. J.	1650	1393
N. M.	785	617
N. Y.	4797	4107
N. C.	1817	1579
N. D.	851	579
Ohio	4789	4448
Okla.	2368	1862
Ore.	1619	1227
Pa.	4393	3838
R. I.	199	181
S. C.	836	760
S. D.	746	585
Tenn.	1306	1216
Tex.	8347	7789
Utah	542	468
Vt.	187	144
Va.	1437	1220
Wash.	2043	1616
W. V.	660	567
Wisc.	2013	1731
Wyo.	428	326
Outside U. S.	947	654
Totals	94,821	81,002

AOPA Members Rate 705 Airports Superior

Members of the Aircraft Owners and Pilots Association rated 705, or 12 percent, of the nation's 5000 airports "above average" or "superior" during the September-January rating period. A sharp gain in rated airports since AOPA's first survey period ending June 31, 1947, was noted. The jump from 443 to 705 rated airports is attributed by AOPA officials to widespread publicity given these airport ratings by the press and the increasing business competition in aircraft sales and service.

Unusual note of the current rating period was the inclusion of 18 "above-average" Canadian, Mexican, Hawaiian, and English airports. Although the survey was inaugurated to rate only U. S. airports, AOPA pilots visiting foreign countries have carefully rated each field and advised their national organization of the available facilities.

Regarding the foreign ratings, the report stated: "In view of the large number of private pilots vacationing in neighboring countries, and our expanding foreign membership, AOPA has found it advisable to survey and rate airports outside of the U. S. Domestic airports will continue to receive priority attention." AOPA's airport rating system is based solely on the voluntary recommendations of its pilots.

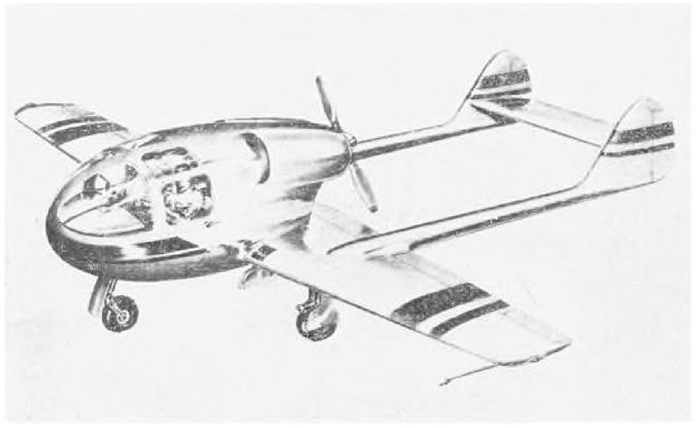
Women's Air Show Set For June 1-6 in Miami

Second annual All-Woman Air Show will be held in Miami June 1 to 6, commemorating the eleventh anniversary of Amelia Earhart's ill-fated takeoff from this city.

Sponsorship by the Florida chapter of the Ninety Nines, organization of women fliers, was made possible when the Birmingham (Ala.) Aero Club relinquished its claim to the date.

Last year's All-Woman Air Show was held at Peter O. Knight Airport in Tampa.

Principal event will be the Amelia Earhart Trophy Race, from Los Angeles to Miami. In addition there will be air derbies originating in Dallas, Tex.; Wichita, Kans.; St. Louis, Detroit and New York. A light plane cruise to Havana, Cuba, also is on the program. Prizes and purses have not yet been announced.



STUDENTS BUILD "IDEAL PLANE"

Students of Northrop Aeronautical Institute are building this personal airplane, and say it is their conception of "the ideal personal aircraft". Configuration follows closely that presented by the "Skylark" (Venice, Calif.) and "Wheelaire" (Tacoma, Wash.), both experimental designs which failed to gain commercial production.

Breakfast Flight to Open First Federal-Aid Field

The new airport at Twin Falls, Idaho, first to be completed under the Federal Airport Program will be opened officially Aug. 29 with one of a series of state-wide aviation breakfasts.

Other aviation breakfasts planned for Idaho this year: Weiser, Apr. 11; Pocatello, May 16; Mackay, June 13; Sun Valley, July 11; St. Maries, Aug. 8; Lewiston, Sept. 12; and Chalis, Oct. 10.

Los Angeles Chamber of Commerce's seventh annual mass flight, formerly known as the Breakfast Flight, will be held May 1-2. Destination is Contra Costa County's Buchanan Field, northeast of Berkeley, and a weekend outing will be the order of the day.

Distributor Named

Western Aero Supply Corp., San Antonio, Tex., has recently been named a distributor for Scott Aviation Corp., and for Reading Batteries, Inc., Reading, Pa.

WAA Offers 365 Surplus Planes in Two Sales

War Assets Administration has announced two sales of surplus aircraft beginning Mar. 29 at Bush Field, Augusta, Ga. and several other locations. At Bush Field, 250 N2S-5 Boeing-Stearman primary trainers and nine Piper liaison-type planes have been set aside for veterans, at prices ranging from $400 to $750, and may be inspected at the field. Veterans have first choice, March 29 through April 5; other priority claimants may buy from April 6 through April 8, after which any planes left will be on open market.

The other sale calls for sealed bids from priority and non-priority buyers of aircraft to be inspected to March 29, with bids required to be submitted by 4 p.m. EST March 29 at WAA Accounting Division, Collections Unit, Room 1513, Temporary "L" Building, Washington, 25, D. C. Planes offered include: 84 N2S-5 Boeing-Stearman primary trainers, 4 Howard NR-1s; 2 Consolidated Vultee PBY-5As, 3 Douglas C-47s, 2 Douglas C-53s, one each of Beech AT-11, Douglas C-49, Lockheed C-56, all at Bush Field; one Douglas R4D5 and one Consolidated Vultee PBY-5A at Cal-Aero Field, Ontario, Calif.; 5 Martin PBMs at Norfolk, Va., and one Douglas C-47 at Walnut Ridge, Ark. Deposit of 10 percent must accompany bids.

Memorial Day, Seaplane "Regatta" Planned

A seaplane "regatta" will be held at Lake Winnipesaukee, N. H., over Memorial Day week-end with expectations that as many as 60 floatplanes and amphibians will participate. Aircraft Owners and Pilots Association has approved the event.

Private seaplane owners and operators throughout the eastern states are being invited to participate. Advance information may be obtained from Robert S. Fogg, Edo Corp., College Point, N. Y.

Company Aids Airmarking By Painting Plant Roof

G. B. Lewis Co., Watertown, Wis., propeller manufacturer, has aided the national drive for airmarkers by painting signs on the roof of its factory.

Generally directed by the Chambers of Commerce throughout the state, the task in this instance was initiated by the company itself. Markings were approved by the State Aeronautics Commission. "Watertown" in 10-ft. letters is claimed to be legible at 5000 ft.

BRIEFING FOR DEALERS & DISTRIBUTORS

TAYLORCRAFT REPORT—Ben J. Mauro, chairman of the board of directors of Taylorcraft, Inc., Alliance, reports that sales for the reorganized company in the last seven months of 1947 totaled $196,319.31 with $60,560.94 gross profit, and $13,041.08 net profit. The report is interpreted as marking the "turning of the tide" for the company and the beginning of a "carefully planned comeback." A statement by C. G. Taylor who continues as president refers to the troubles of the company as "entirely internal organization strife" and states that "our product has always enjoyed the approval of the technicians and flyers."

NAVION MARK—Glenn Hovland, pilot for Chester Wiseman, Austin (Minn.) contractor, reports flying the company's Navion from Sulphur, Nev. to Mason City, Iowa, a distance of 1680 miles, with an average ground speed of 203 mph., and one leg of the trip, from Cheyenne to North Platt, at 234 mph. In another flight, Hovland was flying his family from Austin to Kansas City to make connections for the West Coast. He showed an average ground speed for the 720 mile round trip of 174 mph.

BEECH SALES TOURS—Two members of Beech Aircraft Corp.'s export sales department, Seymour Coleman and Victor E. Larimer, have left Wichita on foreign sales tours. Coleman is on a 70 day round-the-world trip by airline, with visits to Beechcraft distributors at San Francisco, Honolulu, Manila, Bangkok, Calcutta, Bombay, Karachi, Istanbul, Cairo, Neuchatel (Switzerland), Paris, The Hague, London and New York. Larimer, former Marine fighter pilot, left in a four-place 165 hp. Beech Bonanza for a sales trip through Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Canal Zone, Colombia, Venezuela, Trinidad, Granada, St. Lucia, Antigua, St. Croix, Puerto Rico, Dominican Republic, Haiti and Cuba.

PONCA PLANT FOR AUCTION—Piper Aircraft Corp. is selling at auction the eight buildings and office equipment of its Ponca City (Okla.) assembly plant. All operations were halted at the assembly plant Mar. 5. At its peak the branch plant was employing 328 persons.

CROSSWIND WHEELS ON TRICYCLE GEAR—Goodyear Aircraft Corp. has disclosed that it has conducted successful tests at Akron of its crosswind landing wheels installed on the tricycle gear of the experimental Aeronca Chum two-placer. The airplane was lent to Goodyear Aircraft for the tests. O. W. Loudenslager, Goodyear engineer in charge of the crosswind wheel development, told the Wichita section, Society of Automotive Engineers, recently that the castering-wheeled Chum had been successfully taxied and flown in a variety of conditions so that the company could definitely say that the Goodyear crosswind wheels can be used on airplanes equipped with "knee-type" landing gear struts, and on airplanes using tricycle gear. Although Firestone developed a castering landing gear for tricycle gearplanes, which was used on an Ercoupe, experimentally, it was never produced commercially. In the light of Goodyear's recent announcement that it is now manufacturing its castering wheels commercially, the newly announced tests signify that the Goodyear castering wheels will soon be available for tricycle gear planes as well as those with conventional undercarriage. Meanwhile Goodyear is continuing its development work and testing with a larger castering wheel built on the same principle, which is being tested on a Douglas DC-3 transport. Loudenslager described the DC-3 tests as another step in increasing utility and operating efficiency of feeder line planes in areas where multi-strip landing fields are few. The castering mechanism is contained within the wheel hub and the wheels are equipped with a notched cam arrangement which keeps the wheels from swivelling at low taxi speeds, or when the airplane is manually backed into a hangar.

NEW BENDIX MERCHANDISING PLAN—Bendix Radio Division, Bendix Aviation Corp., has announced a new merchandising plan for its flightweight personal plane radios, aimed at greater incentives both to dealers and to consumers. Plan includes new warranty agreements with wider coverage, new discounts to dealers, and price reductions of 10 to 15 percent. Cited as a typical example is the Bendix flightphone, two-hand receivers with built-in VHF transmitter, which now costs $199, a reduction of $30 from last year's price. The new pricetag includes two crystals, VHF antenna, and federal excise tax.

—Alexander McSurely

Melbourne Letter:

Australian Air Boom Levels Off While Aviation Fuel Cut Threatens

Dollar insolvency causing concern over lack of replacements, but little talk is heard of possible switch to British planes.

MELBOURNE—Latest traffic returns indicate that the postwar airline boom is beginning to level off, but just beginning. Airlines continue to fly more passengers and freight over more route miles than at any comparable period before. Even a threatening 20 percent cut in fuel allocations, to save dollars, may not wipe out the latest records because the passenger load factor is now low enough to take care of present loadings if flight schedules have to be retrenched.

Australian National Airways last year trebled 1939 records in hours and miles flown, carried eight times as many passengers and 24 times as much freight, and covered 10 times as many passenger miles as in 1939. The margin over 1946 was substantial on all counts despite fierce competition from the government-operated TAA service.

The saturation point for air freighting is not yet in view. Shortage of freighters holds back full development of airfreight services.

► **Alarm Over Transport**—State governments are voicing increasing alarm over the drainage of transport expenditure from railroads to airlines. Four states report aggregate revenue losses of £2¼-million to airline companies. A meeting of federal and state ministers will be called before June to formulate a national transport policy in which air, rail, road and shipping will be allotted spheres of operation. Of these four interests only railroads are completely public-owned, and their increasing deficits are therefore an incubus on the taxpayers. It is also held that they perform developmental functions that require protection.

While road transport is operating at wartime levels of gasoline rationing, civil aviation has so far got away without major fuel cuts. Certain restrictions have, however, been clamped on charter flights.

A more serious aspect of the dollar insolvency is that the Commonwealth's air fleet may become obsolescent for lack of replacements. Deliveries of a few Convair-Liners and Constellations now in progress exhaust most of the unfilled Australian order backlog in the United States. No orders have been placed since the onset of the dollar crisis last August, and none is likely to be licensed for some considerable time.

► **Little on Switch**—One hears little of plans to switch to British planes. An English aircraft factory representative with the rank of Air Chief Marshal stated on arrival here that "certain competitors" (obviously meaning Americans) are responsible for the rumor that English plane builders can't deliver the goods. But the only mention ever made of Britain's inability to deliver planes has come from Australian government quarters in reply to periodic interpolations in Parliament as to alleged preferences for American aircraft. The official statements leave no doubt that comparable types are not available in England.

The Marshal also overrates the Yankee publicity punch Down Under. He himself is setting up office on behalf of 30 British aircraft makers. No U. S. firm maintains a sales or service organization in the Commonwealth. Except for an occasional handout to one or two local aviation magazines the U. S. aircraft industry is doing little to sell Australia on American planes. The February issue of "Aircraft" sold four times more advertising space to British makers than to Americans. The British aircraft industry, corporately and individually, is represented with big names, with barnstorming demonstration flyers, with engineers and with publicity men.

If nevertheless it has not got a fair break in Australia since the war, it can be due only to one of two reasons. Either Britain does not make the types of plane that Australia wants, or they cannot be delivered as quickly as it needs them. Both of these defects can be expected to be remedied, and the British aircraft industry is then likely to cash in on the replacement demand which has accumulated as a result of the Commonwealth's inability to keep up purchases in the U. S.

► **Airfreight Plans**—London Aero & Motor Services Ltd. has set up a subsidiary in Australia to engage in airfreighting over a wide area in the Southern Pacific. The firm will soon have six specially converted Halifax bombers operating. If occasion demands, aircraft from England and South Africa will be diverted to Australia. The bombers have been converted to carry 7 tons of freight with a cubic capacity of 900 cu. ft. Rates are as low as 8/- (£1.30) a mile for the complete load. LAMS will operate the freighters on a tramp basis.

► **Persistent Postwar Program**—The Commonwealth Aircraft Corporation, operated by the Aircraft Production Division of the Department of Munitions, has excited considerable criticism by its dogged adherence to the original postwar aircraft production program. It is held that at the present slow rate of production the planes will be obsolete before a complete series has left the assembly lines.

One of the types built under the program is the Mustang fighter. It is claimed that the machine is of little first-line value today because of its low operational speed of 300 mph. Only 110 have been completed since V-J Day, and CAC is slowly grinding out the remaining 90 to be built under the program.

Also, about ten Mosquito fighter bombers have yet to be delivered before the program of 209 is completed. The Mosquito has a speed of 350 mph. The Lincoln bomber is more up-to-date. But delivery of the 73 Lincolns on order has been spaced over six years ending 1952. By that time it may be obsolete, some contend.

► **No Nenes Yet**—The most up-to-date type in production is the R.R. Nene jet-powered Vampire fighter with a reputed speed of 540 mph. But not a single unit has been completed, and the program of 50 will not be wound up before 1950.

From a defense viewpoint, the danger lies perhaps in a tendency to rely for Royal Australian Air Force equipment exclusively on the output of the CAC plants. But as an insurance against an aircraft production crisis they are unquestionably performing a vital function. They provide an efficient nucleus which could be expanded rapidly if necessary to turn out latest types of aircraft in large numbers.

Department of Munitions authorities have repeatedly pointed out that Australia faces the alternative of continuing on the present skeleton scale, keeping production "ticking over," or of scrapping the World War II airplane plants altogether.

—Herbert Leopold

"SEA OTTER" TO VENEZUELA

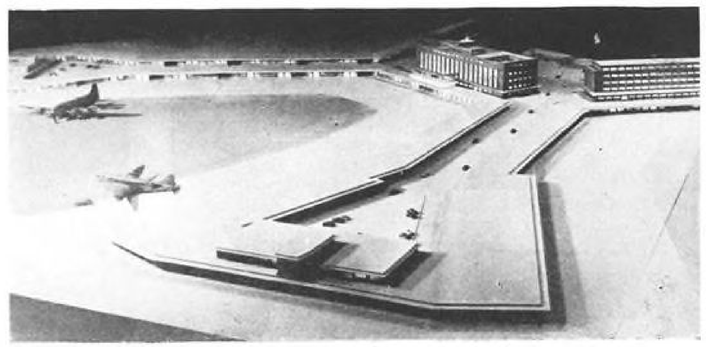
Addition to the Royal Dutch Shell Group fleet in South America will be a Vickers-Armstrongs Ltd. Supermarine "Sea Otter" like that shown above, converted to carry five passengers, with enlarged loading hatch to accommodate stretcher cases. The plane has been shipped to Venezuela, where it will be used mostly to service survey parties in swamp areas. Craft is powered by a Bristol Mercury engine.

Iceland Facilities

International financing of existing radio, traffic control and meteorological facilities in Iceland is proposed by a report prepared by the International Civil Aviation Organization. This would entail joint agreement among nations whose airlines fly the North Atlantic.

Estimated cost of the services is $600,000 annually.

Previously, ICAO arranged for joint financing of $72,000 annually for the maintenance of a Loran station in an effort to provide and maintain facilities required for safe operation across the Iceland portion of the northern route between Europe and the United States and Canada.



BUENOS AIRES AIRPORT TO OPEN IN MAY

Drawing shows over-all view of passenger and operation center of the new $70,000,000 (U. S.) National Airport of the City of Buenos Aires, tentatively set for May opening. International passenger reception center is in center foreground, national passenger reception center at top left, four story administration building and control tower top center, and airport postal service building top right. A four-story hotel is obscured by the administration building. The airport eventually will have 12 runways able to accommodate the heaviest type of planes expected in the next few years. Like Idlewild at New York, it is built on the tangential pattern. The field is 25 min. by superhighway (now being built) from the center of Buenos Aires.

Scandinavians Fuse Airlines in One Unit

Trans-Atlantic SAS combine offers pattern for European operations.

STOCKHOLM—Sweden, Norway and Denmark have been taking steps toward complete integration of resources in the civil aviation field, the latest a pooling of European activities.

When summer schedules come into force next month, the Swedish ABA, Danish DDL and Norwegian DNL airlines will start operating under the common designation Scandinavian Airlines System.

Successful operation of trans-Atlantic routes by the SAS three-country combine, as well as American companies' pooling of facilities in Europe, influenced the move, according to SAS president Per A. Norlin. As in the original trans-Atlantic setup, resources will be in the ratio of 3:2:2.

► **Operations Differ**—Difference between trans-Atlantic and European operations will be that in Europe no central executive organ will be created. The three companies will continue as separate units, but will fuse their operations.

There will be a common schedule, common use of planes and ground facilities, and a single sales organization. By eliminating competing flights with partially filled planes, the companies envisage savings of something like 20 percent of aircraft in use, enabling adequate reserves to be kept against emergencies.

This will help eliminate situations such as one company having its planes scattered over Europe on account of fog, and insufficient numbers available at the home base to take the traffic when the weather clears.

The new arrangement will also permit more intensive use of the existing materiel. A Danish plane arriving in Stockholm in the morning, with a scheduled return to Copenhagen the same evening, for instance, can be used for a flight to Gotland instead of standing idle all day.

► **Better Servicing**—Servicing of each particular type of plane will gradually be concentrated at special points, irrespective of the owner. Costs, as well as income, will be pooled, and profits divided up in the 3:2:2 ratio.

Greatest advantage of the pooling, perhaps, will be the common sales offices throughout Europe. The SAS trans-Atlantic combine's office in New York, likewise, will be able to arrange through passages on the Scandinavian network between the United States and any point in Europe.

Little saving is envisaged in the form of reduced rents or personnel costs at the passenger and freight booking offices, but rather an intensification of service and sales effort. ABA alone will probably save around 100,000 kronor on each issue of the common schedule which will now replace the three separate publications.

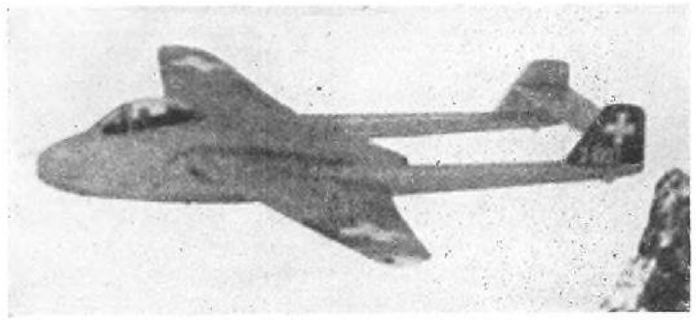
► **Equipment Availability**—The extended Scandinavian Airlines System has an imposing array of planes at disposal—imposing, that is, for three small countries. In operation are 9 DC-4s, 50 DC-3s, 5 Vickers Vikings, 2 Sandringham Mk VIs, and 6 old Junkers Ju-52s.

On order are 17 DC-6s and 4 Boeing Stratocruisers.

Aggregate route milage flown by the group in 1947 was over 25 million kilometers, and 441,512 passengers were carried.

Swedish participant in the announced pool set-up will be a new company formed by the fusion of the 98 percent government owned ABA airline with privately financed Svenska Intercontinental Lufttrafik AB (SILA)—backbone of the original SAS combine. Government and business will own 30 million kronor each of the new company's stock.

DDL has a capital of 30 million Danish kroner, 83 percent being owned by Danish shipping interests, banks and industry, 17 percent by the government. DNL capital is divided 50 percent to ship owners, 30 percent other private interests, and 20 percent government, and totals 25,250,000 Norwegian kroner.



SWISS ORDER 75 VAMPIRES

The Swiss Air Force has ordered 75 de Havilland Vampires under a $9,000,000 contract. The Swiss model is the latest modification of the Vampire III turbojet fighter the RAF is putting into service in quantity. It will have an improved version of the Goblin 2 engine, delivering well above the 3000 lb. static thrust of original models. The order followed a second Swedish order for a "considerable number" of the long-range Vampire IIIs.

WORLD NEWS BRIEFS

LONDON—

British European Airways has dropped charges for meals served in flight on its continental routes. On its U. K. internal services—where there is no competition—the charges will continue.

BEA's decision to discontinue daily London-Manchester-Liverpool service in April is not surprising. Last month passengers averaged five per trip in 21-passenger Dakotas. Time saved over the rail trip is not more than an hour, and less in bad weather.

Air Ministry has awarded contract to Gammon (Malaya) Ltd. for $8,000,000 new civil airport at Changi, Singapore.

Hunting Aerosurveys Ltd. will use a Bristol Freighter in an air survey of more than 10,000 sq. mi. of Iran for the Anglo-Iranian Oil Co. Ltd. Most of the photographs, which will be made into mosaics to aid in the search for further oil deposits, will be from an altitude of 22,000 ft.

CAPE TOWN—

The South African Government's exchange control has refused to provide dollars to a Cape Town company to charter in America an aircraft to carry passengers between the Union and Britain.

COPENHAGEN—

The Royal Danish Aeronautical Society is arranging an International Aircraft Exhibition to be held Oct. 15 to 25 at Copenhagen.

ZURICH—

Swissair, which has four Convair-Liners on order, began the year with 23 planes, of which 11 were Douglas DC-3s, four Douglas DC-4s, and three cargo DC-3s.

ROME—

The government is seriously considering merging the Civil Air Services Department with the Mercantile Marine Ministry. Official reason is that majority of Italian airlines are controlled and operated by steamship lines.

MILAN—

Aviolinee Italiane soon will begin service, using Fiat G-2.2s, with regular flights from Milan to Brussels, Amsterdam, Paris, Frankfurt, Copenhagen, Oslo, Nice, Barcelona and Lisbon, in the first attempt to link Milan with international service. Radar equipment will be installed to cope with severe fog conditions in this area.

GENOA—

The Italian Treasury has appropriated funds for construction of new landing facilities at Genoa on recommendation of American authorities.

LISBON—

Agreement signed by the Portuguese Foreign Minister and the U. S. Ambassador to Portugal will permit the U. S. Air Force and MATS to continue for an unstated period use of Lajes airport in the Azores.

SAN JUAN—

The Puerto Rico Transportation Authority has submitted to the insular planning board plans for construction of the $15,870,000 Isla Verde International Airport, although controversy between the U. S. Navy Department and the Government of Puerto Rico over its location has not been settled.

BUENOS AIRES—

This city is now South American terminal for British South American Airways, which previously went on to Santiago, Chile, an additional 1,000 miles over the Andes. A BSAA plane was lost on this leg several months ago.

The Argentine government has placed an order for 65 military and five transport planes with the Italian firm of Fiat. Delivery by sea is expected shortly. Price was not announced. Of the military planes, 45 are trainers of the Italian type G-35, used by Italy during the war, equipped partly with Daimler-Benz and partly with Rolls-Royce engines. The others are single-engine convoy planes.

Three more Catalina flying boats bought by the Argentine Navy from the Canadian government have been put in service.

The Government has ordered establishment of the first aeronautical engineering courses in the country, and possibly the first in South America. They will be offered through regular engineering schools, and will be supervised by the Argentine Instituto Aeronautica in Cordoba, military aircraft plant.

The Secretary of Aeronautics has ordered commercial pilots and crew members to undergo examinations in line with new government regulations.

Argentine State Air Lines, a domestic carrier, has upped its weekly flight from Buenos Aires to the mountain resort of Bariloche to a thrice-weekly schedule. Alfa, another domestic line, has placed two more DC-3s in service, one for passengers and one for freight.

RIO DE JANEIRO—

Transporte, Carga-Aerea S. A., new all-cargo line, has been set up with $1,500,000 capital.

About 1,000 Rotarians and their wives are expected to fly to the Rotary International convention at Rio May 16-20. Some 4,000 others will travel by other means.

LETTERS

Wright's Biographer

To the Editor:

The amazing thing about Alex McSurely's piece on Orville Wright is that it contains no inaccuracies. I never saw so much bad reporting as the recent AP and UP dispatches about the Wrights . . .

The picture of Orville Wright with your article Feb. 9, showing him in that tweed overcoat, recalls that about the last time I saw him I said to him, "If I may be your sartorial adviser, you should wear more tweeds and try to look less conventional. That coat is the most becoming garment you wear. You're really a tweedy person."

He looked quite pleased.

And McSurely's saying he got out his car and drove him to the hotel makes me think sadly of one night, just three days before his first heart attack, when we sat and talked until about 1:30 a.m. and when I went to call a taxi, he insisted as usual on driving me down. All the way I kept thinking to myself "I must never let him do it again, because supposing he became ill on the way back home."

It's a terrible blow to me to be cut off from frequent contacts with such a mind. I'm sure he was one of the greatest Americans that ever lived. I'd rank him with Benjamin Franklin, whom he admired.

FRED KELLY
Peninsula, Ohio

(Mr. Kelly is the author of "The Wright Brothers," only biography of the Wrights accepted as authentic by Orville Wright—Editor's Note).

Dr. Lewis' Tribute to Wrights

To the Editor:

Let me congratulate you on your very timely and excellent editorial on "The Genius of the Wright Brothers," by Alexander McSurely, which appeared Feb. 9. As you stated, practically all of the newspapers apparently had filed away some place an obituary on Orville Wright that gave the impression that the Wrights were two ordinary bicycle mechanics who just happened by sheer luck to succeed in flying the first airplane.

Again quoting your editorial, which I wish could appear in every newspaper in the country, "Actually the Wrights were the best aeronautical engineers of their time. The first Wright power plane itself is the best proof that the Wrights had progressed well beyond the calculations of their contemporaries, and had substituted their own ideas after finding that much of the so-called scientific fact of their period was in error."

This statement is only too true as evidenced by the research work conducted by the Wright Brothers on a large number of airfoils in their wind tunnels, and only by this research work were they able to design a wing that would give them sufficient lift and a drag that permitted them to fly with an engine of 20 hp. or less. It is reassuring and refreshing to find an editorial such as yours in the conglomeration of misleading thoughts that have been placed in the light of the public by loose statements associating the developments of the first airplane by two lucky bicycle mechanics.

G. W. LEWIS
Research Consultant
Natl. Advisory Committee for Aeronautics

Britisher on Welding

To the Editor:

In your Feb. 2 issue you describe a recent welding procedure for propeller hubs. Your article gives the impression that welding, as applied to the propeller hub, is a novelty and it makes no reference to work which has been carried out in this country . . . especially during the war.

During the early years of the war, the process for fabrication of air screw hubs by welding was devised and patented by the Rotol Co., in this country, the manufacture being carried out for the most part by Messrs. Rubery, Owen & Co., Ltd., Darlaston, Staffordshire.

The process was applied to the fabrication of air screw hubs with two, three, four and even five blades. The first step in the manufacture was to blow two blanks in thick steel plate, the thickness being approximately one inch. These plates, or blanks, were then subjected to three hot pressing operations at a temperature of about 900 degrees C. At the end of the third pressing operation, the blank had assumed the shape of a half hub.

The two half hubs were then flash-welded to form a complete air screw hub. After suitable heat-treatment this was then machined down to the final hub dimensions.

This process was in use in this country for some years and an enormous number of air screw hubs were fabricated in this manner.

The saving in material and in fabrication time to which reference was made in your article applied with equal force to the technique employed in this country. It should be pointed out that the welding procedure described in your article appears to be suitable for a two-blade air screw hub and whether it could be adapted to manufacture of a hub with a larger number of air screw blades appears doubtful.

The fully heat-treated flash-welded hubs were probably stronger than the fusion-welded hubs described in your article. On the other hand, it has to be admitted that much development time was expended before the technique of flash-welding the two half hubs was perfected. The time so spent was justified because of the very large numbers of air screw hubs which were involved during the quantity production that prevailed in wartime.

It is probable that with the more limited production of the present-day, the somewhat simpler process of fusion welded hubs, which you describe, would offer advantages. However, I think it very desirable in this connection to give some prominence to the work that was carried out in this country.

H. DAVIES, Chief Undercarriage Designer
Electro-Hydraulics, Ltd.
Warrington, Lancashire

Longest Endurance Flight

To the Editor:

In reference to the lead letter in your Feb. 16 issue, and in further reference to an item Nov. 24, I have received a memo from J. P. Paine of the Martin Engineering Division:

"In Feb. 16 AVIATION WEEK a letter referred to a longest endurance flight without refueling record established by a Boeing B-29 which remained aloft 22 hours, 15 minutes.

"It should be pointed out that the XPB2M-1R Mars on Oct. 5-6, 1943, made an official endurance flight of 32 hours, 17 minutes, covering a total distance of 4540 statute air miles with a crew of 22 men.

"The details of this flight are presented in GLM Engineering Report 1844 . . . dated Oct. 21, 1943."

I pass it along for whatever interest it may have to you and in behalf of full justice to a great airplane.

RICHARD W. DARROW
Director of Public Relations
The Glenn L. Martin Co.

Lightplanes & Credit Laws

To the Editor:

With all this talk about reinstatement of wartime credit controls, we must see that one mistake is not repeated. In the original wartime version, trade-ins were not allowed as any part of the minimum one-third down payment for aircraft time sales, but trade-ins were allowed on automotive time sales.

If this is repeated, a direct discrimination against aircraft only, the already sick and ailing aircraft industry will be in for a tough time. The only volume we can expect to help our bankrupt companies back on their feet is through trading to wash out the used aircraft.

There is no use in subsidizing the industry on the one hand and hamstringing it on the other. For primary defense reasons these factories must be kept alive and sound. We fought like hell to do this in 1941 (ask John Morgan, Irv Taylor, Grove Webster or Bob Hinckley) and it was 1942 before the Army realized that going lightplane plants were a defense asset.

We will probably have to fight our government again to keep it from cutting its own throat.

I know from experience while on WPB and also interceding with the chairman of the Federal Reserve Board that little sympathy exists there for the small plane industry. We must be vigilant not to allow any repetition of such selective favoritism that will make the path of civil aviation any more difficult than it will be anyway.

HARRY A. SHAFFER, President
Interstate Air-Credit Corp.
Municipal Airport
Minneapolis, Minn.

AIR TRANSPORT

Mediation Board Chairman Opens Record on NAL Pilot Strike

Frank P. Douglass gives background on dispute in letter to Senator Pat McCarran; peacemaking efforts lag as walkout enters sixth week.

Peacemaking in the National Airlines pilot strike—now six weeks old—was pushed farther into the background last week as emphasis was placed on who's to blame for the walkout and on plans by both parties to carry the struggle through to the bitter end.

More light on the question of blame was thrown on the situation by Frank P. Douglass, chairman of the National Mediation Board, who criticized the company's position in a letter to Senator Pat McCarran (D., Nev.). McCarran had expressed concern over repercussions which would follow if a National plane should become involved in a serious accident during the strike.

► **IAM Move**—Meanwhile, the International Association of Machinists, whose members struck before the pilot walkout on Feb. 3, has asked CAB to direct NAL to comply with the labor provisions of the Civil Aeronautics Act or have its certificate revoked. IAM charged that National had failed since last August to bargain in good faith with the union.

After obtaining two delays, the Air Line Pilots Association late last week was slated to present its case in opposition to a CAB proposal to increase National's mail rate. ALPA has charged that NAL, contrary to CAB's findings, is not in a critical financial position. It added that the additional mail pay revenue would be used by the carrier "to bust the union."

► **Flights Continue**—While the legal fight over mail pay continued, National officials prepared to add new services to those already instituted with non-union pilots. The carrier hopes to put its DC-6s back in operation on Apr. 1 with one roundtrip daily flying non-stop between Miami and Newark.

In his letter to Mediation Board Chairman Douglass, McCarran said he considered the NAL strike situation dangerous. The Senator, who is regarded as strongly pro-labor, asked Douglass what the mediation board had done to settle the controversy and whether the parties were willing to arbitrate.

► **Position of Board**—Douglass' reply follows:

"On Sept. 13, 1945, a NAL pilot, Maston G. O'Neal, Jr., cracked up one of National's planes and was discharged by the company for the crash. Subsequently, ALPA processed a grievance over this discharge through the System Board of Adjustment composed of two company members and two pilot members. The dispute was deadlocked by the System Board of Adjustment, there being no provision in the ALPA agreement for a method of breaking this deadlock."

► **Pact Signer**—"After twenty months of unsuccessful effort of the parties to dispose of this dispute on the property, the matter became acute and came to the attention of the National Mediation Board, whereupon the Board had the parties meet in our offices in Washington and, on May 14, 1947, worked out an agreement between the parties that the Mediation Board would name a neutral to sit with the System Board of Adjustment to break the deadlock then existing. That agreement was reduced to writing and signed by the parties in our offices.

"Subsequently, the Mediation Board named a neutral who is an employe of the Civil Aeronautics Administration. Before the Board was set up, we became convinced that our naming an employe of CAA as a neutral was a mistake and we requested his resignation, which was given. We, thereupon, named an outside neutral that we felt had no connection that might be construed as being prejudicial to either party."

► **Strike Set**—"Following this, the management of National Airlines advised us they would refuse to participate in the proceedings unless we named the man originally suggested as a neutral and maintained that position until sometime in November 1947, when ALPA set a strike date on National.

"We again requested the parties to come into our Washington office and attempted to get them to agree to go ahead with the breaking of the deadlock on the O'Neal case. The management requested, first, that three neutrals be appointed by the President of the United States to sit with the System Board of Adjustment to hear and dispose of this case. Finally, after being advised that the President would not participate in such matters, management agreed to take three neutrals to be appointed by the Mediation Board."

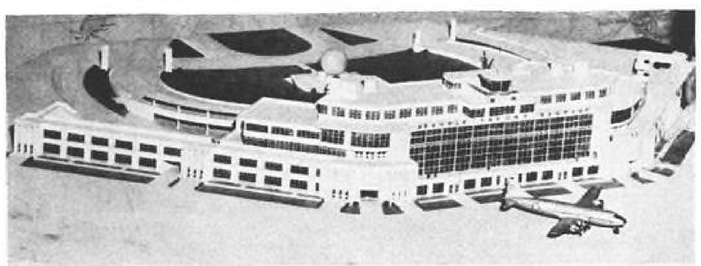
► **NAL Decision**—"ALPA insisted on having only one neutral. Both parties were adamant in this respect. The last afternoon of the meeting here in the offices, management advised the Board that unless their offer for three neutrals was accepted by the pilots that afternoon, it was withdrawn and there were no further offers on the part of management to dispose of the O'Neal case. ALPA was so advised of this declaration by management, and the meeting was concluded.

"ALPA withdrew its members from the service of the company at 11 p.m., Tuesday, Feb. 3, 1948. On Wednesday, Feb. 4, we were advised by the carrier through their local attorney that they would agree to the appointment of one neutral to settle the O'Neal case."

► **New Meeting**—"The following day, ALPA agreed over the telephone to go along with that arrangement. The Mediation Board wired the parties, asking them to be in here from Miami and Chicago on Saturday morning, Feb. 7. At the appointed time, David L. Behncke, president of ALPA, appeared, and management was represented by their attorney here in Washington.

"Management's attorney at that time advised the Board that management's offer to settle the case as above stated had been withdrawn and, the day before, had discharged all of their pilots and were advertising for other pilots to man their service. We were unable to convince management of the folly of such action or to induce them to go ahead and settle this case on the basis above outlined.

"The President was not advised of the pendency of this strike because the Board felt this strike did not substantially interrupt interstate commerce to a degree such as to deprive any section of the country of essential transportation service, and also because we were convinced that management would more than likely not participate in any hearings to ascertain the facts and, in no event, would abide by any recommendations of a fact-finding board."



NEW TERMINAL IN NORTHWEST

Seattle-Tacoma Airport will have one of the largest terminals in the country when this $2,500,000 unit is completed. Foundation of the structure is nearly finished, and cement is being poured in two wings.

All American Asks Pickup Suspension

All American Aviation has asked CAB permission to suspend service on part or all of the mail-express pickup routes which it has operated since May, 1939.

The move follows the board's action last month in designating All American for 1550 miles of conventional feeder routes in the same general Middle Atlantic area now covered by the pickup links. In selecting AAA to operate the feeder system, CAB said the new service could not be inaugurated until duplicating pickup routes were abandoned.

► **Company Attitude**—AAA wants suspension of service on each of its five pickup links to be effective when operations over corresponding feeder routes begin. The company emphasized that the suspension should not be construed as abandonment of the pickup links but only as a suspension lasting for the duration of the feeder certificate.

CAB has for the past year regarded the AAA pickup system as uneconomic, and has stated publicly that its high cost returned small benefit to the public, Post Office Department and the national defense.

► **Probe Started**—CAB last May instituted an investigation to determine whether the pickup service should be suspended in whole or in part in view of the small traffic potential and the high mail payments necessary to support it.

TENDER CARE FOR FRAGILE CARGO

Philco Corporation is using airfreight to rush its new model television sets from Philadelphia to the West Coast. Two hundred receivers recently were shipped out of Philadelphia's Northeast Airport to Los Angeles via three Slick Airways C-46s. Retailing for $339.50 each, the television sets received tender care as the boxes, marked "fragile—glass," were transferred from truck to plane.

Airport Revenue Raisers

New York Port Authority installs vending machines, including one to dispense nylon stockings.

By STANLEY L. COLBERT

Nylon stockings are helping pay for New York's airports.

Machines that sell packaged nylon stockings are among 65 new vending devices distributed at focal points at LaGuardia Field. This is part of the Port of New York Authority's program to make the airport a profitable venture by exploring every revenue source. The machines net an average of $1000 a week.

► **Restaurants Make Most**—This is one of the most spectacular of the Port Authority's revenue-raising methods, but the biggest money-makers are LaGuardia's combined restaurants and bars. These are expected to net $235,000 in 1948—more than double the profit from this source in 1946.

The Port Authority also has opened an employe cafeteria (previously there had been no special eating facilities for LaGuardia's nearly 11,000 employes), and a lunchroom at the international terminal.

► **Seven-Months' Results**—Operating revenues at LaGuardia Field between June, 1947 and the end of 1947 were $952,552, or $50,000 more than all costs there and at New York International Airport. Revenue producing methods inaugurated since that time point to an even greater profit by June 1—end of the first year of Port Authority operation of the airport. These include:

- Control over automobile parking.
- Improvements to the spectator promenade, including "play by play" broadcasts of arrivals and departures with information about the type aircraft, etc.
- Installation of two refreshment stands on the observation platform.
- Seven-day-week opening of the observation gallery at the international terminal.
- Diorama advertising displays (similar to those already installed at Washington National Airport).
- Installation of a camera shop at the international terminal in space not utilized before.
- Re-arrangement of space at the international terminal to accommodate Peruvian International Airlines and Colonial Airlines Bermuda-run aircraft.
- A change in concessionaires at the domestic terminal.
- Addition of several foreign flag carriers, including FAMA, Swissair, and Sabena.
- Conversion of abandoned building into space for KLM, Seaboard and Western and PIA.

► **Plans for Airport Hotel**—Although the immediate need at New York International Airport (Idlewild) is still hangar space, the Port Authority gives indica-

tions that it is working on plans for establishment there of a hotel.

Port Authority officials point to the results of a joint ATA-Port Authority poll of passengers using New York's airports—results which indicate that the largest number of suggestions from air travellers on possible improvements was made for an airport hotel.

► **No Change in Opening**—Meanwhile, there is no change in plans to open the field in July, and six runways will be available for operation on opening day. The instrument runway will not be available for sometime.

Airlines are expected to start familiarization runs at the new international field sometime next month. CAA has already begun plans for training control tower personnel.

The airport will be Number Three in the chain of airports under Port Authority supervision. Others are La-Guardia and Newark. Plans to include Floyd Bennett Field failed when the Navy and the Port Authority could not reach settlement.

Shannon Fire

Damage caused by the fire at Shannon Airport, Eire, will cause only slight inconvenience to airline operations.

Much of the essential radiotelephone and monitoring equipment has been salvaged from the 74 ft. wooden control tower which crashed to the ground. GCA frequencies were used during the fire for ground to air communication.

Colonial President Flays CAB Policy

One of the strongest attacks ever directed against CAB by an airline executive has been made by Colonial Airlines President Sigmund Janas.

In connection with a motion to suspend CAB's recent decision in the Middle Atlantic area case (AVIATION WEEK, March 1), Janas charged that U. S. aviation policy, as administered by the presently-constituted three-man Board, is fast approaching bankruptcy. "I urge Congress, in the course of its current consideration of aviation policy, to investigate the chaotic conditions now existing at CAB," Janas declared. He added that the public interest must be protected against what he termed the current inept functioning of this agency.

► **Favoritism Seen**—"The Board now shows more than just a disposition to favor the large entrenched airlines," Janas stated. "It is forcing the smaller carriers to become more and more dependent on subsidies. In the Middle Atlantic case alone, Colonial was denied route changes which would have saved the taxpayers an estimated $675,000 annually simply by connecting our route terminals."

Colonial was refused a route connecting its two terminals, Washington and New York. The carrier also was denied a New York-Cincinnati link and a Buffalo - Rochester - Syracuse - Binghamton-New York-Atlantic City route.

► **Two-Man Decision**—Janas noted that the CAB decision against Colonial's application for a New York-Washington route was approved by two Board members over the strong dissent of the third —Josh Lee. The airline president declared that "irreparable injury" will result from the Middle Atlantic decision unless CAB grants a stay in order that a case of this magnitude may be decided by a full five-man Board.

Colonial pointed out that shortly before the decision the Post Office Department had asked CAB to take into consideration certain studies which had been made and which affected the area and applications included in the case. "Failure of the Board to grant the Post Office Department's request may result in an illogical and uneconomic system of air transportation not properly adapted to the needs of the postal service," Colonial stated.

► **Post Office Acts**—Concurrently with Colonial's action, the Post Office Department asked CAB to suspend the provisions of the Middle Atlantic area decision pending judicial review of the order. The Department said it has been informed that one or more parties to the case will take CAB's opinion to court unless the Board itself grants reconsideration of the proceeding.

Post Office officials said that even if CAB's decision is modified as a result of court review, the development costs, capital expenditures and current expenses incurred by carriers activating links granted last month will have to be made up through mail pay. If the route awards are nullified, the postal service would receive no benefit for the payments made.

KEEPING UP WITH THE "NEW LOOK"

Style changes in women's dresses have brought changes in airline equipment. United Air Lines engineers recently re-designed its loading stands, to place four steps of moderate height in the space of three. Result: It's a big help to the ladies wearing those longer and tighter skirts. On the left a passenger demonstrates the difficulties encountered with the old type loading stand, while on the right she steps on the new one with ease. The hand rails also have been extended.

Airlines Survey Use Of Airport Facilities

Scheduled commercial airlines last year accounted for only one landing and takeoff in every six at U. S. airports equipped with control towers, according to the Air Transport Association.

A study based on CAA figures covering about 135 fields showed that commercial carriers made only 16.15 percent of the landings and takeoffs, while private flyers were involved in 74.82 percent of the operations. The remaining 9.03 percent were by Army and Navy aircraft.

Planes to China

Transocean Air Lines has signed a contract with the Chinese government to ferry 150 C-46s from California to Shanghai. Pacific Overseas Airlines is slated to assist in the movement, which may begin next month. The planes are now being modified on the West Coast.

Cargo Lines Report Financial Status

Six of the nation's best-known air-freight carriers had total assets of about $5,687,000 last fall, including $1,971,816 worth of flight equipment. Figures as of Sept. 30 showed:

► **Air Cargo Transport Corp.**—Current assets $39,312, flight equipment $69,836, ground equipment $84,157, total assets $221,753, current liabilities $166,183, capital stock $497,560, capital and earned surplus $471,990 (deficit).

► **California Eastern Airways**—Current assets $321,738, flight equipment $410,007, ground equipment $38,113, total assets $931,547, current liabilities $213,949, capital stock $905,000, capital and earned surplus $558,731 (deficit).

► **Flying Tiger Line**—Current assets $929,100, flight equipment $787,770, ground equipment $121,070, total assets $1,910,083, current liabilities $380,149, capital stock $726,000, capital and earned surplus $694,021.

► **Mutual Aviation** (Oct. 31)—Current assets $4261, flight equipment $15,052, ground equipment $4460, total assets $171,817, current liabilities $51,818, capital stock $158,250, capital and earned surplus $101,777 (deficit).

► **Slick Airways**—Current assets $1,026,762, flight equipment $603,646, ground equipment $240,372, total assets $1,830,867, current liabilities $307,243, capital stock $1,758,130, capital and earned surplus $1,257,025 (deficit).

► **Willis Air Service**—Current assets $386,647, flight equipment $85,505, ground equipment $54,753, total assets $621,354, current liabilities $435,070, capital stock $198,220, capital and earned surplus $27,772 (deficit).

Pioneer Reports Profit Of $54,224 in 1947

Pioneer Air Lines apparently is the only feeder to end last year in the black, with net earnings of $54,224. Last year's earnings compare with a deficit of $62,384 in 1946 and a loss of $17,380 in 1945.

Pioneer, which started service in August, 1945 with six cities on a 683-mile route entirely within Texas, now has a 2,183-mile system extending into New Mexico and including 26 points. President Robert J. Smith said PAL probably will add three DC-3s to its present seven, and increase personnel at its Houston headquarters about 25 percent when the 770 route miles granted to the airline by CAB in the recent Arizona-New Mexico area decision are activated.

The nation's first feeder line, Pioneer carried 62,698 passengers last year compared to 20,687 in 1946. Mail and express traffic also showed a considerable increase.

Continental Plans Convair Cargo Runs

Continental Air Lines is studying the possibility of placing one of its new Convair-Liners in cargo service for two months before the craft is used on passenger runs.

This plan, which is in accordance with recommendations made by the President's Air Policy Commission early this year, also has been considered by American Airlines. Continental expects to take delivery on five 40-passenger Convairs late in the spring.

► **Commission Suggestion**—In its recent report (AVIATION WEEK, Jan. 19), the President's Air Policy Commission urged that new type transports be operated regularly on non-passenger schedules for a specified mileage before passengers are carried. The Commission said the period should be sufficiently long to permit mechanical or design weaknesses to become apparent under normal operating conditions.

It was recommended that the test planes be operated daily on cargo and airmail runs over approximately the same routes and using the same airports later to be employed in passenger service. The Commission acknowledged that the manufacturers and airlines have put new planes through long test periods, but added that events had proved these periods have not been long enough. Grounding of the DC-6s for modification had preceded the commission's report by less than two months.

► **Bomber Used**—Continental has been using a converted B-25 bomber in training flight crews for Convair-Liner operations. The carrier said flying characteristics of the two craft are similar and that crews who have been trained with the converted bomber are prepared for almost immediate operation of the new transport.

With inauguration of Convair-Liner service, Continental hopes to achieve higher earnings in 1948 than in 1947, according to Robert F. Six, president. Six emphasized, however, that 1948 results depend to a considerable extent on whether the cost of materials and of labor stabilizes during the coming months.

Continental's annual report, issued this month, showed the company with adjusted net income of $100,458 in 1947 against a $17,939 profit in 1946. A preliminary report (AVIATION WEEK, Feb. 9) had indicated a net profit of $116,411 last year.

House Group Trims 1949 Airmail Fund

The House Appropriations Committee has trimmed estimates for 1949 fiscal year domestic and foreign airmail payments.

The Committee approved $32,000,000 for domestic airmail as against the Budget Bureau's recommendation of $35,588,000 and the current-year appropriation of $47,000,000. The $19,500,000 allowed for foreign airmail compared with the Budget estimate of $26,583,000, and this year's allotment of $40,500,000. The committee pointed out that rates have not yet been fixed over numerous air routes. When they are, supplemental appropriations can be voted.

► **Comparisons**—A schedule presented to the committee by the Post Office anticipates payments to air carriers for domestic services totaling $32,902,000 during the coming fiscal year. Estimated total for the current year is $27,652,222, and $21,736,345 for the 1947 fiscal year.

Payments for the 1948 fiscal year to carriers on a ton-mile or pound-mile basis are estimated as follows with current year payments in parentheses:

► **Payments Listed**—United $6,430,767 ($5,144,614); American $5,233,785 ($4,187,029); TWA $4,324,177 ($3,459, 342); Eastern $2,343,009 ($1,874,407); PCA $1,903,536 ($1,522,829); Western $1,115,447 ($892,358); Northwest $1,791,035 ($1,432,828); Chicago and Southern $1,055,200 (844,160); Delta $692,062 ($553,649); Braniff $692,438 ($553,951); Hawaiian $28,296 ($22,637); National $639,257 ($511,405).

► **Other Carriers**—Payment estimates for the 1949 fiscal year to carriers paid at mileage rates are as follows (estimates for the current year are identical):

Mid-Continent $1,416,496; Inland $594,367; Continental $620,363; Northeast $784,650; Caribbean-Atlantic $80,554; Pioneer $464,241; All American $772,267; Colonial $618,947; Monarch $241,071; Challenger $134,794; Florida $166,920; Southwest $367,126; West Coast $156,336; Empire $284,869.

Post Office charts disclose that airmail, despite its rapid growth over the past ten years, remains only a fractional part of total first class mail.

The 772,185,070 pieces of domestic airmail handled during fiscal 1947 compared with 20,665,029,753 pieces of surface-shipped first class mail. Airmail accounted for a larger portion of the foreign mail volume. Foreign airmail shipments for fiscal 1947 totaled 94,089,218 pieces. Other than airmail, foreign shipments for the year totaled 271,747,258 pieces.

CAB SCHEDULE

Mar. 22—Hearing on Icelandic Airlines' Iceland-New York-Chicago route application. (Docket 3259.)

Mar. 30—Hearing on British Caribbean Airways' Kingston, Jamaica–Miami route application. (Docket 3275.)

Apr. 5—Oral argument on Alaska Airlines' request for retroactive mail rates. (Docket 2021.)

Apr. 5—Hearing on Aerovias Nacionales de Colombia's Bogota-Barranquilla to New York route case. (Docket 3249.)

June 14—Hearing on Capital Airlines' (PCA) mail rate case. (Docket 484.)

Survey Analyzes Freight Shipments

Surveys made recently by 14 certificated airlines and seven uncertificated cargo operators disclose that apparel, textiles and dry goods were the principal products moving by airfreight last fall.

In a typical seven-day period in October, these items constituted 48.5 percent of the goods carried by the seven uncertificated companies. Agricultural and horticultural products (including cut flowers) totaled 16.5 percent; medicines, drugs and toilet preparations 3.7 percent; hides, leather, furs, skins and derivative products 3.4 percent; machinery and machine parts 3.4 percent; auto parts and accessories 3 percent, and all other items 21.5 percent.

► **Certificated Carriers**—During the same period, auto parts and accessories constituted the major freight category of the 14 certificated airlines, accounting for 12.2 percent of the ton miles flown. Apparel, textiles and dry goods were a close second at 11.8 percent; machinery and machine parts 8.2 percent; printed matter (including newspapers and magazines) 7.8 percent; agricultural and horticultural products (including cut flowers) 7.6 percent; electrical appliances and parts 6 percent; medicines, drugs and toilet preparations 3 percent, and all other items 43.4 percent.

The seven uncertificated carriers (Slick, California Eastern, Flying Tigers, Air Cargo Transport, Willis, Riddle and Mutual) flew about 1,067,000 revenue ton miles during the survey week, compared to 990,000 ton miles for the certificated lines.

Of the total freight volume handled, the certificated lines carried 78.9 percent of the automobile parts and accessories, 69.1 percent of the machinery and machine parts, and 65.6 percent of the electrical appliances and parts. The uncertificated carriers handled 81.6 percent of the apparel, textiles and dry goods flown during the week, 70.1 percent of the agricultural and horticultural products, and 56.7 percent of the medicines, drugs and toilet preparations.

SHORTLINES

► **British European Airways**—Carried 462,656 passengers, 5,700,200 lb. of freight and 2,809,000 lb. of mail in 1947.

► **Capital (PCA)**—Reports net loss of $427,348 in January compared to an $898,320 deficit in the same month last year. Operating expenses dropped from $1,856,011 in January, 1947, to $1,653,533 in January, 1948, while operating revenues increased from $953,104 to $1,286,286.

► **Chicago & Southern**—On Apr. 1 will begin a new series of all-expense summer cruises to Havana.

► **Delta**—Will inaugurate service to Hattiesburg, Miss., on its new AM 24 cutoff from New Orleans to Meridian about Apr. 1. . . . CAB has denied the carrier's motion to stay the Board decision which granted PCA Birmingham-New Orleans and Bristol, Tenn.-Atlanta links.

► **Florida Airways**—Has added another $75,000 Beech D-18C to its feeder fleet.

► **Pan American**—Recently borrowed an additional $4,000,000 under its $40,000,000 credit arrangement obtained in October, 1946. Including the latest takedown, $12,000,000 is now outstanding.

► **Parks Air Transport**—Hopes to start service in June on part of its feeder network which includes close to 4000 route miles. Company expects to use 20 DC-3s when the entire system is activated.

► **Sabena**—Net income last year was about $500,000 against $2,842,964 in 1946. . . . George Herrick, former technical editor of Air Transport magazine, has been appointed public relations director in the U. S. with headquarters in New York.

► **Slick**—Has established a supply and service division to modify and license C-46 aircraft, overhaul Pratt & Whitney engines, and build elevators, stabilizers and other C-46 parts for sale. The new division currently is modifying and rebuilding aircraft for foreign interests.

► **TWA**—Last week cancelled service to Palestine through Lydda airport after one of its planes reportedly was fired on after leaving the field.

► **United**—Has signed an interline agreement with BOAC. . . . Transfer of operating and passenger service headquarters, together with offices of other departments, from Chicago and San Francisco to Denver is nearly complete, and all flight operations are now being directed from Denver.

Iowa Airplane Company Readies Feeder Service

Iowa Airplane Co., which was designated for feeder routes in CAB's North Central area decision in December, 1946, is preparing to start service by June.

The carrier originally was awarded 1251 miles of short-haul links radiating out of Omaha into central Nebraska, South Dakota, Iowa and Minnesota, contingent on a showing of adequate airport facilities. In asking immediate issuance of a certificate, the company stated that suitable fields will be available at 20 of its 29 points by the time service can be inaugurated.

Initial operations with DC-3s would be over segment (A) from Omaha/Council Bluffs to North Platte, Neb., via Lincoln, Beatrice, Hastings, Grand Island and McCook. Segment (B) from Omaha/Council Bluffs to Huron, S. D., via Fremont and Norfolk, Neb., Sioux City, Iowa, and Sioux Falls and Mitchell, S. D., would be opened in August. Activation of segment (C) from Omaha/Council Bluffs to Minneapolis/St. Paul via Des Moines, Boone/Ames, Fort Dodge and Mason City, Iowa, and Albert Lea and Rochester, Minn., is scheduled for October.

Points without adequate airports are Fairbury, Kearney and Lexington, Neb., on segment (A); Columbus, Neb., and Yankton, S. D., on segment (B) and Atlantic and Creston, Iowa, and Austin and Owatonna/Fairbault, Minn., on segment (C). F. C. Anderson, president of Iowa Central, said his company has conducted negotiations for additional capital but added that it is difficult to make definite financial arrangements until the CAB certificate is issued.

U. S.-Alaska Cargo Exemption Rejected

CAB has rejected its proposed Economic Regulation 292.7 which would have permitted uncertificated cargo operators to conduct temporary scheduled common carrier service between Alaska and the U. S.

The Board said it had reached this decision in the light of information showing that the contemplated action would not lead to the orderly development of air transportation over the route. Pan American Airways and Northwest Airlines led the opposition to the proposed exemption (AVIATION WEEK, Jan. 26).

At the same time, CAB instituted an investigation to determine whether Pan American, Northwest and Pacific Northern Airlines are rendering adequate cargo service over their certificated routes between Alaskan and U. S. points. The Board will determine whether there is need for these carriers to provide an additional amount or different type of property service. At present, uncertificated lines are handling the bulk of the cargo traffic on the Alaskan run.

Slick Announces Details Of New Freight Tariff

Slick Airways' new freight tariff, which is slated to become effective late next month, will contain rate increases averaging 1½ cents a ton mile and will feature door-to-door delivery on shipments under 1000 lb.

The tariff is designed to counteract both rising costs and the lack of balance in traffic flow and is expected to yield about 14½ cents a ton mile. The previous tariff, which became effective Aug. 1, 1947, had yielded slightly less than 13 cents a ton mile. Before the final draft, company officials had expected the new tariff to increase rates between two and three cents a ton mile (AVIATION WEEK, Mar. 15).

Revised charges call for a first-class New York to Los Angeles rate of $16.80 per hundredweight for 10,000 lb. and over; $17.40 per hundredweight on 3000 to 9999 lb.; $18.10 on 1000 to 2999 lb.; $20.20 on 300 to 999 lb.; $23.60 on 100 to 299 lb.; and $34.20 on 25 to 99 lb. The latter three weight classifications include pickup and delivery service.

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AVIATION WEEK
MARCH 22, 1948

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SEARCHLIGHT SECTION

(Classified Advertising)

EDITORIAL

Careless Pilots Pay

Newspapers throughout the country Jan. 26 reported a Beech Bonanza had been seen disintegrating in the air over Salt Lake City, Utah. Some dispatches said the plane "blew up" in flight, a frequent misinterpretation. Three persons were killed.

Beech Aircraft Corp., which in our opinion is conducting the best continuing safety education program in the industry, has made available to Bonanza owners its preliminary findings in this accident. It was not content to allow the matter to stop with a cursory telegram of inquiry.

While not intended as a press announcement, the letter written by Beech's vice president and general manager, John P. Gaty, to Bonanza owners is an unusual case of research and reporting for an aircraft manufacturer. Certainly it points again to the penalty aviation exacts for foolhardiness.

We have not seen an official government report on this accident, but it seems unlikely that there could be disagreement with evidence reported by the manufacturer indicating that weather on the day of the accident was unflyable except for the most experienced pilots.

The Bonanza, NC-301OV, took off at 2 p.m. on Jan. 25 from Ogden to fly to Las Vegas under visual flight rules. The pilot, Dean L. Knudsen, had no background of instrument training or experience, the company reports, and had flown a Bonanza about two hours. He had two passengers.

"Approximately 25 minutes later, witnesses on the south side of Salt Lake City heard an airplane alternately roaring wildly and quieting in the overcast which was about 1800-2000 ft. above them. At about the third roaring dive the airplane broke out of the bottom of the overcast in what appeared to be a high speed power spiral. As the pilot apparently tried to pull up the nose, the right wing folded back and hit the fuselage, the complete tail assembly and rear section of the fuselage was knocked off and the airplane then tumbled in the air, throwing all occupants clear; either through the windshields or windows. Safety belts were snapped in two. Probably all occupants were either killed or rendered unconscious by contact with the inside of the airplane during the high-speed tumble, and were oblivious to their subsequent free fall to the ground. . . .

"The tumbling also separated the engine and nose wheel section from the main part of the fuselage."

(The company adds these details to point out that "parachutes would probably have been useless to the occupants, and to warn all Bonanza owners that any airplane which breaks up at high speed due to overstress and mishandling will rotate or tumble at such a rate that escape by parachute will be impossible in almost all cases.")

The manufacturer adds in its warning letter:

"This accident is a repetition of similar previous accidents, due in our opinion to the factor that these letters have repeatedly cautioned against in the strongest possible terms: namely, the attempt by an untrained or out-of-practice pilot to fly on instruments. Our last letter stated, 'Flight under instrument conditions by untrained or out-of-practice pilots is enormously hazardous and the penalty for this transgression of the CAA regulations, and the laws of nature, is often death, not only for the transgressor but also for his friends who are with him.'"

Is there any plainer way to state it? Mr. Gaty asks.

Beech reports that CAA listed 43 fatal non-air carrier accidents in 1946 that were caused by inexperienced pilots trying to fly on instruments.

The manufacturer's findings indicate that the weather was unsuitable for flight because of severe turbulence, snow showers and icing threat, but that even without these problems the accident "easily could have happened" because of the pilot's lack of experience in instrument flying conditions.

Damning testimony by at least six experienced pilots has been compiled by the company. Their quotations attest to the judgment used by the pilot in taking off.

Said a pilot with 16,000 hours—We arrived Ogden (from Salt Lake) at 1:50 p.m. . . . We heard the Ogden tower repeating a flight of NC-301OV to Las Vegas . . . I told the tower to advise the pilot that the weather at Salt Lake was very squally . . . Several snow squalls in the valley. I heard the tower inform Mr. Knudsen . . . Mr. Knudsen continued to taxi out and took off . . . The air all day was extremely turbulent.

Said a 5000 hour pilot—One ship (of two cross country flights) returned about 45 minutes before the Bonanza left. The instructor reported snow squalls and more than moderate turbulence . . . Considering the weather reports and the report of the instructor, we decided to cancel the Navion flight to Delta and return. All instructors in the office at the time commented on how foolish these people were in planning to leave. In our judgment, the weather was anything but good for such a flight.

Said another 5000 hour pilot—I had decided that the weather was too bad for me to make a charter flight to Delta about half an hour before Dean Knudsen made his takeoff. Snow showers and extreme turbulence were reported.

Said a pilot with 4500 hours—About 2 p.m. I did make a flight in a Navion from Ogden to Salt Lake City. On this flight the turbulence was greater than I have experienced for several years as a pilot. Reducing of airspeed was necessary, which I did from 125 mph. to 100 mph. Even at this reduced airspeed the effects of the gusts upon the airplane were very severe and most uncomfortable.

Said a 3500 hour pilot—Before he took off I called the tower on the phone to see if Knudsen had checked weather. The tower advised that he had. I then told the tower to find out if he wanted to borrow some parachutes and what kind of flowers he wanted . . .

Said a 3000 hour pilot—Between 4 and 5:30 p.m. I was in a Piper Cub flying from Provo to Ogden . . . From Salt Lake in to Ogden the turbulence was very severe. My complete attention was required to handle the airplane. It was necessary to fly with reduced power and at times to throttle completely back.

Thus, the Beech letter says, it seems clear that the pilot had available for his guidance a wealth of experience, had he chosen to ask advice, and that some of it was offered anyway.

"We recommend that pilots with relatively few hours seek the counsel of old hands who are always ready and willing to help. And that Bonanza owners remember that good judgment and discretion coupled with a knowledge of the limitations of one's own personal skill be used at all times in connection with weather. . . ."

Autopsies on dead, foolish pilots are unnecessary. We have seen no better evidence recently to prove it than this report from Beech.

When is personal aviation going to launch an industry-wide safety education program that will make available such details, findings and interpretations as these to all pilots?

—ROBERT H. WOOD

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The tactics of General Nathan B. Forrest, famous Confederate cavalry commander, have been studied by military strategists since 1865. Hitler sent Rommel to Tennessee in the thirties to find the secret of Forrest's success. The answer was *speed and mobility*. General Forrest simply got to more places faster than his competitors.

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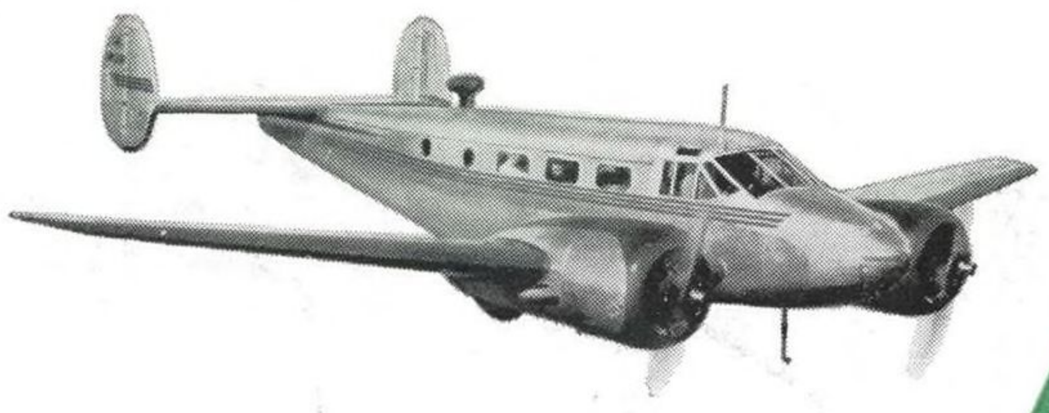

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