AVIATION WEEK

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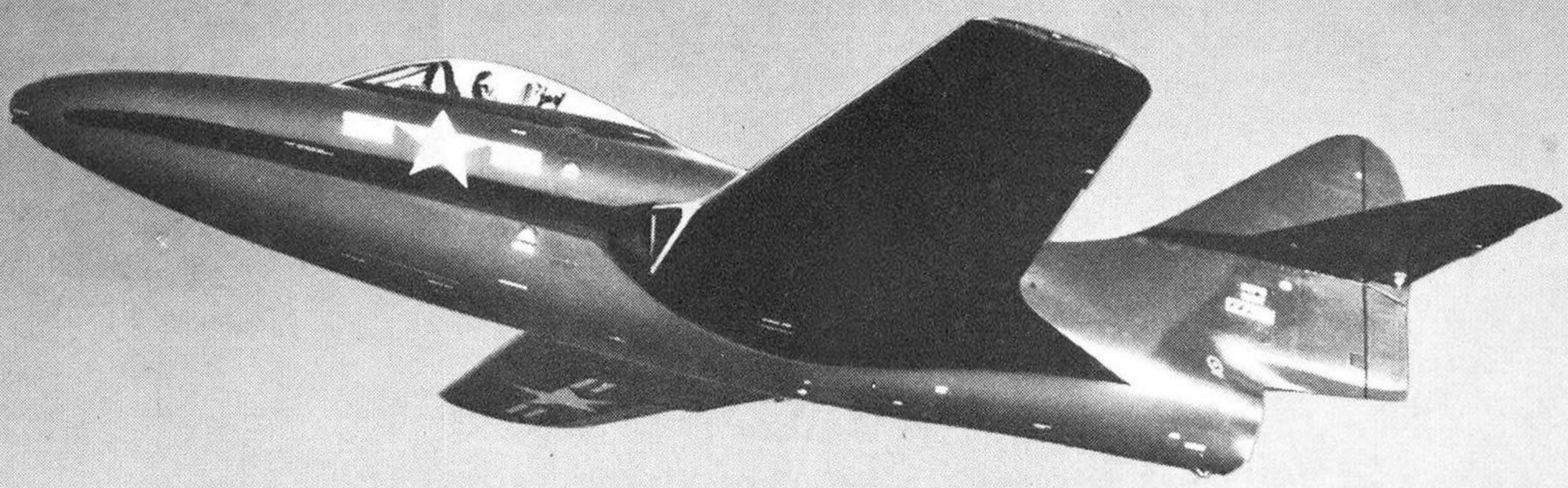

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NEWS SIDELIGHTS

Defense Puzzle

Secretary of Army Kenneth Royall recommended his own demotion to undersecretary in order to have a logical line of command in the National Military Establishment, in testimony before the Senate Armed Services Committee, but Secretary for Air Stuart Symington went one step further and supported a suggestion for his demotion to assistant secretary.

Senators are skeptical of the provision of the administration-proposed Tydings Bill reorganizing NME which would establish 17 secretaries; a secretary of defense, an undersecretary, and three assistant secretaries; and a secretary, undersecretary, and three assistant secretaries for the departments of Air Force, Army, and Navy.

Under the proposal endorsed by Symington, the nine assistant secretaries and the three department undersecretaries would be dispensed with and the department secretaries would become assistant secretaries, under the undersecretary of defense.

Congress, however, is not expected to go this far in cutting back NME management. One incongruity in the present set-up is that the undersecretary of defense (Steve Early), although lower in rank, takes precedence over the three department secretaries.

Naval Facts

During the recent debate on the fiscal 1950 military appropriations bill, congressmen supporting an amendment to boost naval aircraft procurement funds trumpeted that the Navy now has jet planes that can take off a carrier, fly 2500 miles to a target and then return and land on a carrier.

Navy denies that it has any such plane anywhere except on a dim and distant drawing board. Combat radius of the latest Navy carrier bombers now in service is about 700 miles. These are the Martin Mauler (AM-1) and the Douglas Skyraider (AD series).

Profit Paring

U. S. Air Force procurement experts expect that work load resulting from renegotiation of profits on military aircraft contracts will begin to become heavy during the middle of 1950.

This is about the time contracts let under fiscal 1949 contract authorization will begin to be completed in any sizeable volume.

Not Hit As Hard

Major U. S. uncertificated carriers operating internationally will be hit by CAB's new crackdown on nonskeds but probably not as hard as domestic operators and those flying "overseas" to Alaska and Puerto Rico. In aggregate, such companies as Transocean Air Lines (the world's largest uncertificated carrier), Seaboard & Western Airlines and Alaska Airlines took in far more revenue last year from contract passenger and cargo flights than from nonscheduled services.

CAB in September, 1947, banned nonscheduled passenger transportation between the U. S. and foreign points. Nonscheduled international cargo business is still legal but subject to all the severe new restrictions.

Biggest threat to U. S. uncertificated international operators is CAB's extremely narrow view of what constitutes legitimate contract activity. The Board is now pressing enforcement actions against Transocean and Seaboard & Western, charging that many, if not all, of these carriers' contract operations are actually common carrier in nature.

If the Board's view prevails it may mean the end for the international "tramps" which the armed forces have found to be of inestimable value in emergencies.

Air Maneuvers

U. S. Air Force has planned a five-year series of air maneuvers to test its offensive punch against its defensive capabilities.

The maneuvers will begin with Operation Blackjack next month, an attack by B-36 and B-50 bombers aided B-29 aerial tankers on an Atlantic Coast metropolitan area with Air Defense Command jet fighters defending.

Next year Strategic Air Command will attack from bases in the Caribbean in Operation Poker. In 1951 Operation Casino will see SAC attack industrial targets over the entire eastern half of the United States from bases in Alaska, the Caribbean and Newfoundland.

In 1952 the attack will be made on the Pacific Coast from bases in Hawaii and Alaska with the finale in 1953 scheduled for an all-out attack on the key targets of the entire United States with attacks coming from any overseas base available for SAC operations.

Canadian Purchases

Lieut. Gen. Edward Rawlings, USAF comptroller, recently told the House Appropriations Committee that USAF planned to buy additional aircraft spare parts in Canada.

Rawlings said the purchases would be small by USAF standards. It is this type of purchase that is at issue in the Douglas-Canadair suit recently filed in Montreal.

Douglas is seeking $1.4 million in damages resulting from alleged breach of a Canadair licensing agreement with Douglas after the Canadian firm sold C-54 and C-47 spare parts to U. S. customers including the U. S. Air Force.

Haylift Rebuttal

Air Force takes issue with the report of western congressmen that they had been informed the bill for USAF's "Operation Haylift" would be $30 million and that the cost for each bale of hay "bombed" to snowbound livestock would be $100.

A statement filed by USAF places the cost at $1,300,000, for a total of 5496 hr.—most of which would have been required for training anyway in reconnaissance and supply flights.

In addition to dropping 4577 tons of feed and hay during the month operation, USAF said it transported 458 passengers; 5000 blankets; 77 "Weasels"; a radio beacon; 200 lb. of medical supplies; 5000 cubic centimeters of blood plasma; half an ounce of radium (worth $500,000); 875 gallons of fuel oil; and 2250 lb. of plows, tractor parts.

Super Carrier

Navy laid the keel of the USS United States, the 65,000 ton super carrier prototype last week at Newport News, Va.

Navy already has $9 million from fiscal 1949 funds to finance initial work and is counting on another $43 million earmarked for the carrier in fiscal 1950 funds. Economy minded congressmen led by John Taber (R., N. Y.) tried to throw out super carrier funds during the House debate on the military appropriation bill. The super carrier funds face a higher hurdle in getting through the Senate. Final cost of the super carrier is now estimated at $188 million.

AVIATION CALENDAR

Apr. 24-27—American Assn. of Airport Executives convention, Oklahoma City.
Apr. 26—Annual meeting, American Ordnance Assn., Ambassador Hotel, Los Angeles, Calif.
Apr. 29-30—Sixth IAS personal aircraft meeting, Hotel Allis, Wichita.
Apr. 30-May 1—Fourth annual southeastern air show and exposition, Craig Field, Jackson, Fla.
May 2-4—Second annual meeting of the Airport Operators Council, Denver.
May 3-20—Third annual foreign transportation institute, American University, Washington, D. C.
May 5-6—Annual conference on air transportation, sponsored by School of Aeronautics, Purdue University, Lafayette, Ind.
May 5-6—Purdue University School of Aeronautics air transportation conference, Lafayette, Ind.
May 8—Annual southern states air carnival, Dannelly Field, Montgomery, Ala.
May 10—IATA traffic conferences, Europe.
May 12-13—1949 forum, American Helicopter Society, Hotel New Yorker, New York City.
May 17—IATA technical conference Switzerland.
May 18—National Fire Protection Assn. committee on aviation and airport fire protection, Fairmont Hotel, San Francisco.
May 19-21—Society for Experimental Stress Analysis, spring meeting, Hotel Statler, Detroit, Mich.
May 21—Aviation progress exposition, Baltimore Municipal Airport, Baltimore, Md.
May 23-26—Eighth national conference, Society of Aeronautical Weight Engineers, Inc., Biltmore Hotel, Dayton.
May 24-27—Second joint conference of IAS, Royal Aeronautical Society, Hotel Astor, New York City.
May 26—IATA executive committee, Montreal.
May 26-27—Annual meeting, Society of the Plastics Industry, Edgewater Beach Hotel, Chicago.
May 27-30—Annual convention, Women's National Aeronautical Assn. of the U. S., Chase Hotel, St. Louis, Mo.
May 28-30—National Negro Aviation Convention, Bleuthenthal Field, Wilmington, N. C.
May 31-June 4—AWA annual convention, Statler Hotel, Wash., D. C.
June 2-5—Mississippi Goodwill Air Tour, Jackson, Miss.
June 3-12—Sixth annual Michigan Aviation week.
June 4-5—All-Woman Air Show, Amelia Earheart Field, Miami, Fla.
June 4-5—Fourth annual air fair and industrial exposition, Shawnee, Okla.
June 7—Third ICAO assembly, Montreal.
June 16-17—Mid-year meeting, Aviation Distributors and Manufacturers Assn., Broadmoor Hotel, Colorado Springs, Col.
June 17-18—Annual Ohio aviation clinic, Bowling Green State University.
June 20-24—AIEE, summer general meeting, New Ocean House, Swampscott, Mass.
June 26-27—NAA 27th annual national convention, Akron, Ohio.
June 27-29—Formal dedication of Naval Ordnance Laboratory aeroballistics division, followed by five half-day technical sessions, White Oak, Silver Spring 19, Md.
July 2-10—National soaring contest, Harris Hill, Elmira, N. Y.
Sept. 6-8—Annual spark plug and ignition conference, sponsored by Champion Spark Plug Co., Hotel Secor, Toledo, Ohio.

PICTURE CREDITS

13—Wide World; 46—American Airlines.

INDUSTRY OBSERVER

►Air Force generals testifying on Capitol Hill dropped a hint recently that Convair would get another order for 11 additional B-36D composite-powered intercontinental bombers. With the 170 now on order this would bring USAF B-36 strength up to an eventual 181. This is just enough to equip four heavy bomber groups and two strategic reconnaissance groups without spares or allowing for normal attrition. According to present USAF plans the B-36 program will keep Convair's Ft. Worth plant going full blast for another two years at least.

►Convair will modify the 23 B-36As already delivered to the Eighth Air Force as the RB-36E, the photo-reconnaissance model required for strategic reconnaissance. The RB-36s will be equipped with permanent mapping camera installations and will carry four General Electric J-47 jet engines in addition to six Pratt & Whitney Wasp Major piston engines.

►USAF requirement for a strategic reconnaissance plane has been kicked around more than any other category during postwar years. First competition was between Howard Hughes' XF-11 and Republic's XR-12 with the nod going to the Republic plane. Production contract for 20 R-12s was in the mill when the Bennett Meyers-Hughes-Brewster investigation hit the front pages and put the R-12 contract in the Wright Field "pending" file. Last year the Northrop jet Flying Wing was picked to fill the gap and letter of intent for 30 RB-49s was given to Northrop. That was washed out when it became evident that the YB-49 would require considerable redesign before it could go into production. Earlier model R-36s were finally picked.

►North American will modify 16 B-45As into the RB-45 to meet USAF requirement for night photo planes to replace current Douglas RB-26s. USAF now has a surplus of RF-80 tactical reconnaissance planes but still plans to convert some North American F-86s into a photo version. Boeing will equip two groups of RB-50s for strategic reconnaissance. These groups will be augmented by 24 converted B-29 tankers for aerial refueling of the photo planes.

►Solid bets in USAF long term procurement plans are the Douglas C-124A and the Lockheed TF-80. The C-124A now figures as the standard replacement for the C-54 transport and standard equipment in heavy troop carrier squadrons. Both USAF and Navy will buy more TF-80s out of fiscal 1950 funds with USAF counting on a large increase in subsequent years when pilot training rises sharply to fill out the 70-Group program.

►Despite an order to Northrop for 48 F-89 twin jet night fighters, USAF is still shopping around for a satisfactory night fighter. The Lockheed F-94, (110 on order) a night fighter version of the TF-80C, is destined for service with National Guard fighter squadrons as a replacement for the North American Twin Mustang (F-82), which will be handed down from Regular units as soon as F-89s are available. USAF has boosted night fighter requirements from three to 11 squadrons, needing an estimated 300 planes. Ratio of night fighters to day fighters is expected to increase when a top-notch night fighter is developed to justify more than service test quantity orders.

►USAF officials told Congressmen that the next fighter to get a sizeable production order will be either the McDonnell XF-88, Lockheed XF-90 or the North American F-93. Contract for the F-93 production has already been cancelled although North American is building two experimental prototypes and expects to have the first flying this summer. Two McDonnell XF-88s are now flying at Muroc and will probably prove out as the longest-ranged jet fighters now in the air. Since USAF's most pressing problem is for a high altitude interceptor, Lockheed's XF-90 will probably get the order.

►In its beefed-up production version, the Boeing B-47 will be USAF replacement for the B-50 medium bomber. Boeing's turboprop-powered giant, the XB-52, still figures as the B-36 replacement in current USAF plans. B-52 is scheduled to get into production in about five years.

NEWS DIGEST

DOMESTIC

Kaman Aircraft Corp. has received approved Type Certificate for its K-190 industrial helicopter (AVIATION WEEK, Aug. 2, 1948).

Colonial Airlines last week completed 19 years of operation without a fatality to crew or passengers. The only U. S. certificated carrier to compile such a record, Colonial flew 250,545,622 passenger miles since April, 1930.

Pan American Airways started Stratocruiser service to Bermuda from New York International Airport (Idlewild). Two flights a week each way will be made with the big Boeing transports. Because of the lease dispute with the Port of New York Authority, passengers are cleared through the Airlines Terminal in New York City and go by bus direct to the plane.

Personal aircraft exports for March by ten companies reporting to Aircraft Industries Assn. totaled 45 planes valued at $222,924. France was the leading importer, taking 15 planes valued at $35,899. For first three months of year, exports totaled 113 planes valued at $597,462.

Lt. Gen. Ennis C. Whitehead took command of the Continental Air Force, with headquarters at Mitchel Field, L. I., succeeding Lt. Gen. George C. Stratemeyer.

Lockheed Constitution, Navy transport, next month will begin a 10,000-mile Navy recruiting tour, visiting 18 major U. S. cities. Representatives of the Bureau of Personnel will travel on the plane.

FINANCIAL

Jack & Heintz Precision Industries reports net loss of $2,663,623 for the year ended Dec. 31, 1948, on sales of $12,758,022. Preceding year, sales were $21,519,828, and company showed profit of $174,623. While sales of fractional horsepower motors dropped, aviation sales are gaining in volume.

FOREIGN

Berlin Airlift hit new high in tonnage when U. S. and British flyers flew in total of 12,940 tons in 24-hour period ending noon Apr. 16. With 95 percent of available aircraft in operation, 1398 planes landed at the three Berlin airfields. About 82 percent of all flights were made by U. S. planes.

British Royal Aeronautical Society has elected Sir John S. Buchanan president for 1949-50. With a long career in aircraft development and manufacture, he has most recently been technical director of Short Bros. and Harland, Ltd.

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CAB Cracks Down on Large Nonskeds

Stringent rules may spell doom for some; small irregulars only slightly affected.

By Charles Adams

The Civil Aeronautics Board has taken long-promised action toward lowering the boom on more than 100 large nonscheduled operators using transport-type equipment.

Goaded by widespread violation of its present regulations, the Board has adopted, effective May 20, new rules which seem likely to put many irregular carriers out of business by the end of the year. The general nonscheduled exemption from certificate requirements under which these companies have multiplied during the postwar period will be repealed on June 20.

In order to continue service after that date, the large irregulars must have on file with CAB an application for individual exemption. The number of these exemptions that will be issued probably will be kept to a minimum.

Nonscheduled carriers denied individual exemptions must stop operating. And even before CAB rules on an application for individual exemption the carrier concerned may have its letter of registration suspended or revoked for rule violations.

► **Rigid Restrictions Planned**—Operating authority will be granted only to those large irregular operators which can show their proposed service is required by the public. The Board will rigidly define the scope of any nonscheduled service authorized under an individual exemption and will have power to suspend the privilege without notice when it believes such action is in the public interest.

Significantly, one of the factors which the Board will take into consideration in disposing of applications for individual exemptions will be the extent to which the applicant has engaged in illegal regular operations in the past and has otherwise failed to comply with regulations.

CAB Chairman Joseph J. O'Connell, Jr., estimated recently that 59 of the 111 large irregular carriers holding letters of registration performed about 85 percent of the service provided by nonskeds. The remaining 52 companies had failed to submit operating statistics, and some probably have gone out of business.

► **Nonsked Fleet**—O'Connell said the 59 active nonskeds have a total of 151 aircraft, including 90 DC-3s, 24 C-46s, 18 DC-4s and 19 miscellaneous types. He added that "probably not more than 30 of the large irregulars have been conducting regular operations in violation of the Civil Aeronautics Act." Most of these alleged violators have been active on the transcontinental, New York-Miami-Puerto Rico, and Pacific Northwest-Alaska routes.

CAB stated that although a substantial number of large irregular carriers have attempted to comply with the present general exemption, the regulation has served as a cloak for activities far beyond those originally contemplated. Purporting to operate pursuant to the regulation, some of the large nonscheduled carriers have offered a substantial amount of regular service rather than the "irregular, limited and sporadic" flights actually authorized.

► **Certificated Carriers Protected**—In May, 1947, the Board revised the nonscheduled exemption "to protect the public from improper practices by noncertificated carriers and to protect the certificated carriers against unregulated competition." Since then, CAB declared, abuses have not only continued but have become, in many respects, more flagrant.

"Temptation on the part of the large irregular carrier—which has no other means of livelihood—to violate the regulation is very great because the company tends for economic reason to gravitate to the more lucrative routes and to operate with increasing regularity thereon," CAB explained. "To obtain sufficient utilization of large aircraft for an economical operation, a substantial number of flights between the same points becomes necessary or desirable, even if only one or two large aircraft are being used."

During recent oral argument on CAB's proposed cancelation of present operating privileges, major nonscheduled operators conceded it is virtually impossible to fly profitably without considerable frequency and regularity.

► **Pooling Agreements Hit**—Besides

Large Numbers, Small Place

Despite their relatively large numbers, the nonscheduled operators whose wings are being clipped by CAB occupy a comparatively small place in the overall air transportation picture. The 59 major domestic and international nonskeds early this year had about 151 transport-type aircraft against 1050 for U. S. certificated operators. Personnel for the large irregulars numbered 3000 against nearly 83,000 for the regular lines; and aggregate revenue in 1948 for the nonskeds is estimated at $35 million against close to $650 million for the certificated carriers.

Percentage comparisons of nonsked and certificated airline business in third quarter 1948—an active period for large irregulars—were:

	Domestic Operations		Intl. & Overseas	
	Certif.	Nonsked	Certif.	Nonsked
Aircraft operated	90.7%	9.3%	87.0%	13.0%
Rev. pass. miles	97.5%	2.5%	89.2%	10.8%
Cargo ton miles	93.5%	6.5%	60.4%	39.6%
Total revenues	97.8%	2.2%	92.0%	8.0%
Net worth	99.3%	0.7%	95.5%	4.5%

Note: Scheduled all-cargo carriers such as Slick and Flying Tigers not included in study. Contract operations of such uncertificated international carriers as Seaboard & Western and Transocean Air Lines are included in tabulation although most of these carriers' business is claimed to be under contract.

pointing out that individual carriers have violated the regulations, CAB took notice of illegal pooling arrangements which have been made most frequently through use of ticket or travel agents. These agents represent a number of large irregular carriers and advertise that they sell tickets between designated points.

Even though the operations of a particular irregular carrier represented by the agent are irregular and infrequent, judicious spacing and arrangement of such flights by a sufficient number of nonskeds results in a frequent and regular service by the group. Thus, when a prospective passenger asks the ticket agent for accommodation, he can be offered space which is available on any date desired.

CAB said "It is difficult to imagine an arrangement which more completely violates the purpose of the nonscheduled exemption." Consequently, the Board has issued for public comment proposed rule revisions requiring large irregular carriers to file with CAB all agreements with ticket agencies or brokers and to file copies of all charters or leases of aircraft. The proposal would prohibit the making of agreements resulting in the conduct of regular operations through combination of services.

▶ **Summer Business Affected**—Transcontinental nonscheduled airlines were preparing for record summer business prior to CAB's crackdown. Some may go ahead with their plans, operating wide open as long as possible on the theory that past violations will prevent their getting individual exemptions anyway.

Meanwhile, CAB has made operations more difficult and expensive for large nonskeds and contract carriers by tightening applicable safety regulations effective June 1. Anticipating that some nonskeds will now shift to allegedly contract operations, the Board has asked Congress for authority to extend CAB's economic jurisdiction to this type carrier.

Some 2000 small irregular carriers (using lightplanes primarily) are affected in only a minor way by CAB's latest action. The blanket exemption for small nonskeds is continued, but these operators are also prohibited from entering into any agreements to conduct combined operations with other carriers so as to circumvent regulations against frequency and regularity of service.

Canadair Tooling for F-86 to Start Soon

Tooling for first production order of 100 Canadian-built F-86 jet fighters under license from North American Aviation will start soon at Canadair Ltd.'s Montreal plant. The license arrangement has been cleared by U. S. military authorities and first planes are expected to come off the Montreal assembly line in October, 1950. Additional orders are expected to follow the first 100 planes.

Canadian sources reported that North American had also agreed to supply 30 American-built F-86s to Canada at a cost of approximately $15 million. An authoritative American source said that negotiations for North American to build F-86s for Canada had not yet been approved by National Military Establishment.

▶ **License Deal**—License agreement was arranged between North American and the Canadian government which then assigned the manufacturing contract to the Montreal company. Agreement included rights to make modifications in the original design. It is understood that principal modifications will be in armament, and in a possible powerplant substitution.

Toronto plant of A. V. Roe is currently making a new jet engine, designated the Orenda, which may be used in place of the General Electric J-47 (TG-190) axial flow engine rated at 5000 thrust lb. which is standard in the production American-built F-86s. The Orenda was originally developed for the Canadian-built XC-100 twin jet fighter.

Record Payload

Convair's XC-99, giant-six-engine transport counterpart of the B-36 bomber, set an unofficial aircraft payload record recently by lifting a 100,000 lb. payload off Carswell AFB, Ft. Worth.

Flight was part of Convair's flight test program preliminary to USAF acceptance of the plane. It was not officially observed by National Aeronautic Assn. officials for a record claim.

The XC-99, equipped with a double tandem landing gear, took off in about 5000 ft. with Convair test pilots B. A. Erickson and Francis Keen at the controls. It remained aloft for 2 hr. and 50 min., and exceeded the 6562 ft. altitude required for official payload records. Official record is held by a Boeing B-29 which lifted 33,435 lb. over Guam in the fall of 1945.

Largest payload carried previous to the XC-99 100,000 lb. performance was an 84,000 lb. bomb load carried by a B-36 from Ft. Worth to Muroc, Calif., on Jan. 29. NAA officials indicated that the XC-99 was capable of breaking 29 other world aircraft records in addition to the payload mark.

Canadian military authorities indicated that it was inadvisable to combine an untried powerplant with an untried aircraft, so that another engine may now be used in the XC-100.

Canada's principal jet fighter now in service is the British de Havilland Vampire Mark III of which 77 are in service in Canada. Proposal to replace these with the F-86s has aroused considerable comment in Canada among "Buy British" advocates who had urged that a later Mark VII Vampire should be purchased, instead of the F-86s.

The forthright Montreal Gazette reported that the prompt reaction of RCAF in favor of the F-86 was an admission that the Vampire Mark IIIs are "almost at the end of the obsolescent road." The Gazette cited the difference between Canada's and Great Britain's jet fighter tactical requirements and added: "It was not made clear however why Canada purchased British jets which emphasize qualities desirable in defense of Britain rather than Canada, in the first place."

Toronto Telegram cited the recent tests of USAF jet fighters against the B-36 (AVIATION WEEK, Mar. 14) in which the fighters including the F-86 did a less-than-adequate interception job at 40,000 ft. It also cited the fact that a Vampire powered with a de Havilland Ghost engine, holds the world's altitude record of 59,492 ft. The Canadian Vampires in service have smaller Goblin II engines.

Query for ECA

O'Connell asks how far program goes in aiding foreign air competition.

Just how far has ECA gone in building up the competing trans-Atlantic airlines of Western Europe?

In a letter to Paul Hoffman last week, CAB Chairman Joseph J. O'Connell put the question squarely up to the ECA Administrator. He pointed out that there are already more trans-Atlantic airline seats than there are passengers. O'Connell also asked what, specifically, were ECA plans with regard to Italy's airline to South America, already operating, and its planned routes to New York and Venezuela.

ECA's reply parallels those to the hundreds of other queries from special interests worried about the revival of Western European competition.

▶ **Brewster Query**—The whole thing started at the opening session of the Senate Interstate and Foreign Commerce Committee's investigation into U. S. airline finances. Sen. Owen Brewster (R., Me.), "chosen instrument" advocate, asked O'Connell about the recent purchase of four Boeing Stratocruisers by British Overseas Airways Corp. from Sweden and the reported plans of BOAC to spend $15,-million to buy 10 more ships direct from Boeing. Swedish contract calls for payment in pound sterling.

Stating that some U. S. airlines can't afford Stratocruisers, Brewster objected to BOAC making purchases "at our expense." He pointed out to AVIATION WEEK that even if ECA doesn't actually pay for the planes, "ECA money makes it possible for the British government to divert their own funds for this purpose." O'Connell conceded that through ECA, the U. S. "could be in the position of indirectly financing the development of foreign airlines."

Actually, ECA contributed upwards of $40 million in direct aid to foreign airlines, as well as making more of Western Europe's own dollars available for aviation purchases. These dollars practically all go to the U. S. aircraft manufacturing industry.

▶ **Hoffman's Reply**—Hoffman's reply to O'Connell doesn't attempt to get specific, but outlines ECA's duties and responsibilities, namely European recovery. This means increasing the Marshall Plan countries' ability to earn foreign exchange through both visible and invisible exports (in this case air travel fares). At the same time ECA is attempting to cut Western Europe's dependency on dollar products.

The Hoffman letter tells O'Connell that ECA bases its judgment entirely on the economics of a request—if it will aid recovery, how much, if resulting procurement would have any serious impact on commodities. ECA reply to O'Connell doesn't even mention Italy.

Cannon States Case for USAF

Record peacetime budget for military air power cleared its second major hurdle by a smashing 271 to 1 vote in the House.

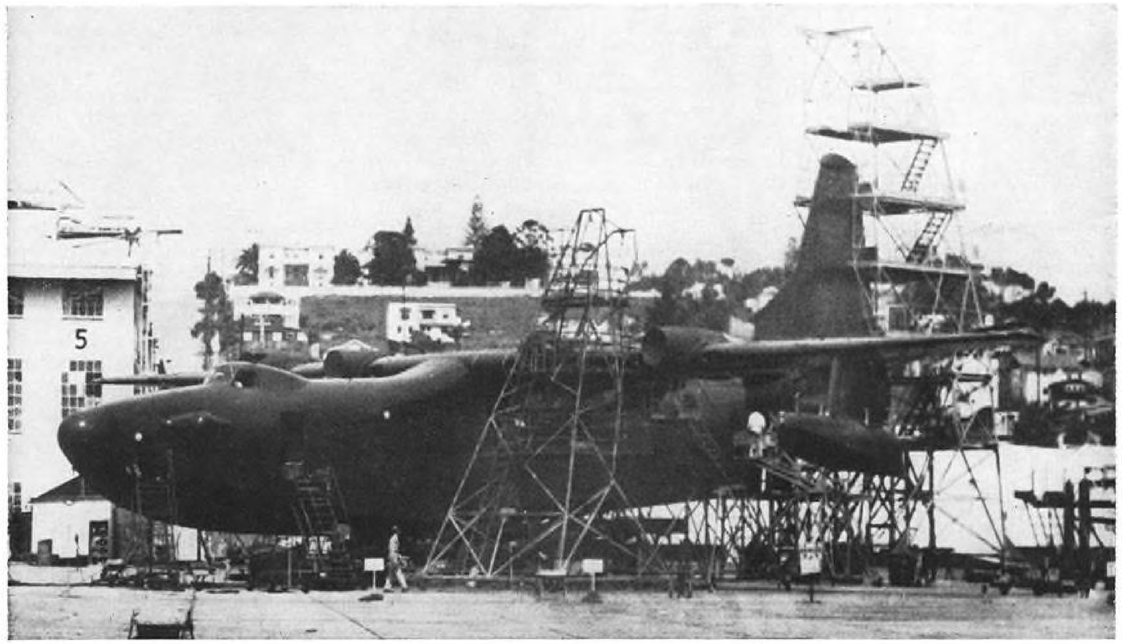
The House vote supported recommendations of the House Appropriations Committee (AVIATION WEEK, Apr. 18) to provide $2.9 billion for procurement of 3393 new military planes with airframe weight of 49,540,000 lb. Of this total the Air Force gets 2550 planes (41.8 million airframe lb.) and $2,217 million in new procurement funds. Navy will get 843 planes and $687 million in procurement funds. Navy airframe weight estimates have been revised downward from 9 million to 7.7 million lb.

▶ **Second Step**—During debate on the bill that give a total of $15.9 billion to the National Military Establishment. House leaders made it clear that they were taking the second step toward the program of rebuilding American air power that they launched last year. In this program they also made it plain that the Air Force is now considered the first line of American defense and will get the lion's share of military air power funds.

▶ **Navy Defeat**—Navy's bid for a $343 million increase in aircraft procurement funds was lost by a vote of 125 to 6. Lack of support for Naval Aviation was based on the oft-expressed thought that the Navy could have an adequate Naval Air Force out of the $5 billion voted the Navy, and that it was up to the Navy to use its funds to get the planes its spokesmen claimed it needed.

Navy lost an additional 422 planes by the amendment's defeat. The additional planes would have been: 157 jet fighters; 230 attack planes; 25 patrol bombers; and 10 jet trainers.

▶ **House Sentiment**—Sentiment of the majority vote backing the Air Force was keynoted by Rep. Clarence Cannon



NEW FLYING BOAT ROLLED OUT

First photo of Convair's rakish XP5Y-1 flying boat shows it in final assembly position on Lindbergh Field, San Diego, awaiting installation of four Allison T-40 turboprop engines. Design features a high length/beam ratio hull which reduces flight drag while improving water handling characteristics. Note radar-operated remote turret installation either side of bow. Huge 62½-ton craft has 390 mph. top speed, fastest big boat in history. It has 146 ft. span, 130 ft. length and stands 45 ft. high. Extensive final installation will delay first takeoff from San Diego Bay, adjacent to field, until midsummer. Both long-range sea search and heavy-duty transport versions are planned. Craft uses extensive pneumatic control of various units from auxiliary gas turbine.

(D. Mo.) chairman of the House Appropriations Committee:

"Only land-based bombers could reach Moscow with a lethal charge. With the signing of the North Atlantic pact we would have ample land bases and within a week we could blast every nerve center of communication and production, every military concentration and every naval submarine and air bases.

▶ **Floating Decks**—"Why should we waste vast sums of money on naval planes tied down to a radius of five or seven hundred miles to be launched from floating decks which cannot even approach the shores of continental Europe—when a smaller amount of money can supply land-based planes about the effectiveness of which there can be no possible question? . . .

"Naval aircraft cannot deliver the atomic bomb. Naval airplanes are limited to a range of approximately 500 miles—700 miles at the most. Navy flat tops in the Baltic and Mediterranean could not possibly survive.

▶ **Navy Functions**—"We have the greatest Navy in the world and we intend to keep it the greatest Navy in the world. But the function of the Navy in modern warfare is the maintenance of lines of communication and transport. Let it exercise those functions. The launching of atomic bombs at strategic targets is the function of another branch of the service.

"There was a day when wars were won by control of the sea. England gave the world a hundred years of peace through mastery of the sea. But today wars are decided by control of the air. We must meet changed conditions or perish. . .

▶ **Modern Weapons**—"If we must spend money for armament let us invest it in modern weapons to meet the changing conditions of the times. Let us spend it for long-range, land-based bombers which will do more than anything else to preserve the peace of the world.

"The only way to avoid war is to have available at any instant the means of striking swiftly and surely and effectively at any distance. The atomic bomb serviced by land-based bombers is the only weapon which can insure that protection. As long as we have both we can and will maintain the peace of the world."

NWA Files Damage Suit Against Martin

A $725,000 damage suit has been filed against the Glenn L. Martin Co. as a result of the Northwest Airlines Martin 2-0-2 accident near Winona, Minn., last Aug. 29.

Northwest asks $450,000 for the lost plane, $250,000 for loss of services of four other 2-0-2s, and $25,000 in workmen's compensation for which the carrier became liable. The petition said the Winona accident occurred when "a wing tore off in flight." Thirty-seven persons were killed in the mishap which apparently came while the plane was passing through severe turbulence.

▶ **Defects Alleged**—The suit, filed in Cleveland, alleged that the planes were not suitable for passenger service and that Martin was negligent in their production. It added that shortly after the Winona crash another 2-0-2 failed in flight and had to be removed from service. Defects allegedly were found in the remaining three planes, forcing them out of service for periods of about six months each.

Martin officials described the court action as a quarrel between insurance companies representing the manufacturer and the airline. Formal hearings on the Winona accident have been completed by the Civil Aeronautics Board, but no report on the cause of the mishap has yet been issued.

▶ **Changes Were Made**—CAA-approved changes were made in the wings of the 2-0-2s following the Winona crash (AVIATION WEEK, Oct. 11). Further modifications in the wings of Northwest's fleet of 24 Martin transports are now underway in Baltimore. The work involves a basic change in the front spar.

CAA Order Affects Continental Engines

Several thousand older Continental engines and the light airplanes they power were affected by a recent CAA technical bulletin requiring inspection of a rubber coupling on the engine generator, and replacement if it showed signs of wear. Order as originally issued called for immediate compliance before next flight of the airplane, thereby effectively grounding the airplanes until the inspection was made.

Last week CAA hurriedly sent out amended notices to all regions and owners extending date of compliance until May 2 and permitting owners to use planes until that date.

▶ **CAA Requirement**—S. W. Rolle of CAA technical services, said that the order called for a similar inspection or replacement every 100 hr. unless the coupling was replaced by a new metal enclosed part. This redesigned part is being supplied by Continental on its newer engines, and has been recommended as replacement for the old part at overhaul.

Rolle said the order applied to such Continental A-65 and C-75, C-85, C-90 and C-145 engines as did not have the new metal enclosed coupling. Many of the A-65 models did not have generators, since they powered planes which did not use starters. The order of course would exempt these.

▶ **Wearing Problem**—The CAA engineer said that service reports indicate a tendency for the unshielded coupling to disintegrate with wear, and that some of the pieces have gone inside the engine, affecting the magneto and throwing the engine out of timing. He reported approximately 60 cases of failures of couplings within the last year.

A Continental spokesman said that his company had requested the CAA order for the inspection or replacement, but considered it a minor item, and had not expected it to result in even temporary grounding of any airplanes. Continental has manufactured about 17,000 engines in the series named. It is difficult to determine how many of these are affected, because of the later models which have already been supplied with the metal enclosed part and because of the models which are not equipped with generators. The inspection he said was a matter of only 15 minutes work by a good mechanic.

Court Decision

The U. S. Supreme Court has dealt a final blow to airline hopes for millions of dollars in retroactive mail pay.

In a 6 to 2 opinion, the high court ruled that the Civil Aeronautics Board has no authority to grant mail pay increases for periods in which a final mail rate for a carrier was in effect and unchallenged. The decision upholds a CAB opinion issued in December, 1947.

TWA, which took the Board's decision to the Supreme Court, wanted over $11 million in retroactive mail pay to cover losses incurred during the period Jan. 1, 1946, to Mar. 14, 1947, the date the company petitioned for a higher rate. CAB agreed to review (and has raised) TWA's mail pay back to Mar. 14, 1947, but insisted that the rate in effect prior to that time must stand since it was not challenged. Capital Airlines' request, filed Jan. 14, 1947, for about $5 million in additional mail pay dating back to June, 1942, also was denied by CAB.

▶ **Carrier Assumes Risk**—The Supreme Court majority said that the practical effect of permitting retroactive mail pay boosts for periods prior to the time a rate challenge was filed would be to place all carriers on a permanent cost-plus-fixed-fee basis. It added that the carrier would have no incentive to operate within its mail rate since losses suffered could be recouped through a request for higher pay covering the deficit period.

CAB said that the risk of loss, if mail rates prove inadequate, should fall upon the carriers. The Board noted that it had not tried to recapture excessive profits earned under final mail rates.

Jet Tests No-Gear Landing on Carrier

(*McGraw-Hill World News*)

LONDON—A new approach to increasing range of carrier-borne fighters has been tried out by the British Navy.

Successful experiments have been carried out recently by the Admiralty in belly-landing a jet-powered Vampire Naval fighter on a special "flexible" flight deck fitted to one of the Navy's carriers.

On this deck—which was really just the normal steel surface covered with a layer of rubber material—the specially-modified Vampire, without wheels and conventional arresting gear, landed on its skid. The plane was brought to a standstill in a very short distance, it is reported. The fighter plane was catapulted from the ship and thus made the whole circuit without any need for landing gear.

Weight saved by this method would add considerably to aircraft range. Navy is continuing with the experiments, most details of which are still secret.

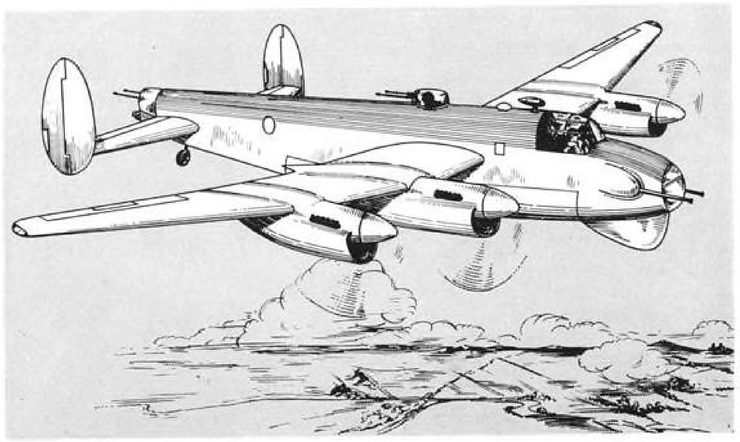
The Admiralty announced shortly afterwards that the Navy's chief test pilot, Lieut. Comdr. Eric Melrose Brown, O.B.E., D.S.C., R.N., had been awarded the Boyd Trophy "for outstanding skill and enterprise during development work culminating in hazardous and successful experimental deck-landing trials." The Boyd Trophy is awarded annually to the Naval pilot or aircrew who achieves the finest feat of aviation for the Navy.

▶ **First Proposal**—Use of a flexible flight deck was first proposed about 18 months ago by the Ministry of Supply, and subsequently developed at the Royal Aeronautical Establishment at Farnborough. Cmdr. Brown first landed a weighted glider on a flexible surface at the R.A.E., and later landed a jet fighter on the same surface.

A similar flexible deck was fitted to H.M.S. Warrior (a Colossus class carrier of 13,350 tons displacement), and further landings made with the modified Vampire.

Cmdr. Brown, an R.A.E. test pilot, made flying history in 1945 when he made the first landing on a carrier with a jet-propelled aircraft—putting down a Sea Vampire on the deck of H.M.S. Ocean while she was steaming in a heavy swell off the Isle of Wight. Later he made deck-landing trials with the twin-jet Gloster Meteor fighter.

Some 4½ percent of the gross weight is accounted for by the undercarriage of a naval fighter like the Vampire. Practical difficulties in handling an aircraft without an undercarriage are outweighed by the gain in payload and range.



Britain's New Long-Range Bomber

Avro Shackleton, developed from Lincoln, can cruise about 6000 miles on anti-submarine patrol duty.

Britain's latest very long-range bombing-reconnaissance plane, A. V. Roe's Shackleton, has made its first flight. Designed to cruise about 6000 miles at better than 200 mph., it was built for over-water patrol duty with the Royal Air Force Coastal Command.

Its obvious job will be anti-submarine patrol since so far, no other effective protection has been devised to shield the British Isles from submarine blockade in the event of another war.

None of Britain's World War II patrol planes could range half-way across the Atlantic, cruise about there for a prolonged period, and return to base. The Shackleton will emphasize long endurance combined with greater bombing power and improved defensive armament to be used against submarine attack.

It will combine the longer range of the flying boat with a bomb (or depth-charge) capacity equal to or greater than the shorter-ranged Lancasters which served in this capacity during the war.

▶ **Roomier**—Developed from Avro's Lincoln, present RAF standard bomber, the Shackleton will have a much roomier fuselage, 12 inches wider throughout most of its length. This will mean a great deal in comfort to the crew on long missions, and a long, large capacity bomb bay. Above sketch shows an accurate portrayal of the plane's conformation at a fairly late development stage—there may be superficial alterations in this appearance at the last moment.

Its resemblance to the Avro Lincoln is marked—but it will be much more sturdily powered, with four Rolls-Royce Griffon 57 engines (liquid-cooled 12-cylinder Vee-type), each developing 2450 hp. at takeoff, in place of the Lincoln's Merlin 68 or 85 engines, which produced only 1635 hp.

▶ **Propellers**—The Griffon 57 incorporates a two-speed, single-stage supercharger, and indirect propeller drive through a double-pinion gearbox—the rear pinion of which drives the inner shaft of the contra-rotating propeller system, the front pinion driving the outer shaft. The Shackleton, therefore, will be the first four-engined British plane to fly with contra-rotating propellers (Rotol).

By comparison with the Lincoln's 82,000 lb. gross weight, the Shackleton should be able to lift 94,000 lb., plus—this having been the original design weight figure quoted a year ago. The 120-ft. wingspan of the Lincoln will probably be upped to about 130 ft., and the extra lifting capacity will be used to carry more bombload and the extra fuel for the Shackleton's longer range. Otherwise, the wing is the traditional Avro-bomber structure.

▶ **Twin Tails**—Tail assembly also follows the Lincoln's twin-fin-and-rudder pattern, but fin area has been increased to counteract the additional side-area of the longer and deeper fuselage.

Undercarriage will be conventional tail-wheel type, with Dowty hydraulically-operated main gear and tail-wheel. It is not clear whether the main gear will have single or double wheels, but a single wheel design is more probable.

A number of significant changes distinguished the Shackleton from the Lincoln:

• **The H2S** anti-submarine search-radar radome, which was always carried amidships in the Lincoln, and whose upper

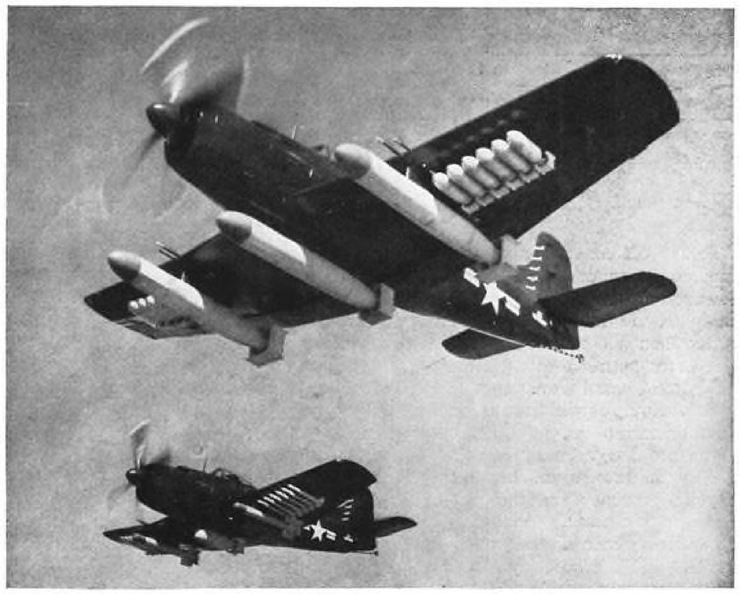
portion always obstructed passage up-and-down the length of the cabin, has been moved forward to the nose of the Shackleton. In addition to clearing the cabin, this change allows the radar operator to shift readily to the bomb-aiming position in the extreme nose of the plane, and act as forward-gunner.

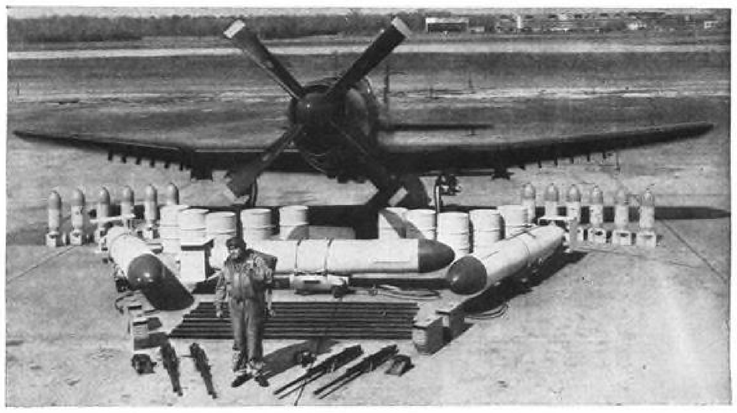
• **Forward guns** have been increased from .50 calibre to twin 20-mm. cannon (probably Hispano) and are mounted in nose barbettes permitting greater downward training movement. This is an important improvement in the plane's ability to defend itself against a surface vessel's guns.

Other armament will mainly resemble that on the Lincoln: a dorsal turret (Bristol Type B-17) mounting two 20-mm. Hispano Mk. 4 or Mk. 5 cannon, and a tail-turret (Boulton-Paul Type D) electrically-operated, with radar sighting.

Another identifying difference of the Shackleton: the inboard engine nacelles project aft past the trailing edge of the wing, which is unlike the Lancaster and Lincoln.

Speed of the Shackleton probably won't exceed the Lincoln, which does 315 mph. maximum, 215 mph. long-range cruising.





"ABLE MABEL" BOOSTS GROSS

The Martin Mauler (AM-1) is shown above carrying a record payload for single engine aircraft. Top Mauler took off with a gross weight of 29,332 lb. including 10,689 lb. of armament (three torpedoes and twelve 250 lb. bombs plus cannon and ammunition) while lower Mauler grossed 27,000 lb. and carried a 2000 lb. bomb, two Tiny Tim rockets and 12 five-inch rockets. Below chief Martin Test Pilot O. E. "Pat" Tibbs stands amid the 14,179 lb. useful load (including fuel and Tibbs) carried by the top Mauler when it grossed 29,332 lb. on takeoff. Previous high for the Mauler was a 25,520 lb. gross and 9000 lb. of armament. Navy pilots have nicknamed the Mauler "Able Mable".

Boeing Production Unaffected by Quake

The Pacific Northwest's worst earthquake had virtually no effect on production at the Boeing Airplane Co. plant in Seattle, Wash., nor did it cause any appreciable damage to the plant.

The quake came during a lunch period. The 15,000 persons employed on the day shift immediately evacuated work shops and restaurants but there was no panic. Approximately $100 million worth of finished or partly completed planes in the Seattle and Renton plants and on Boeing Field, across the street from the Seattle plant, escaped damage.

Jacks under one plane in the service center were reported to have "walked" several inches.

Sixty windows were smashed in various Boeing buildings and two catwalks between the engineering and administration buildings had to be closed when steel girders sheered off. One man was injured slightly by a falling light globe and another employee suffered a slight heart attack.

Jigs in the production area may possibly have been thrown out of adjustment but had not yet been checked at the end of the week.

Boeing employment now exceeds 25,000, although cancellation of the B-54 bomber project is reported to affect approximately 500 workers. Since this is less than the normal monthly voluntary termination figure, any workers laid off are expected to be absorbed on other projects.

No Cause Found

Federal investigators have been unable to determine the cause of the Pan American Airways DC-4 accident which took place at Tamgas Mountain, Annette Island, Alaska, on Oct. 26, 1947.

Bound from Seattle to Juneau Alaska, the plane failed to make an intermediate stop at Annette Island because of extreme turbulence. It headed for Juneau and hit Tamgas Mountain 196 ft. below its 3600 ft. summit. The 13 passengers and crew of five were killed.

Investigation showed the plane was far off course when it struck the peak. There was no evidence of structural or mechanical failure. CAB speculated that the accident might have been caused by severe turbulence or icing which resulted in loss of control. The report noted also that the PAA weather forecast failed to include information on the severe turbulence around Annette Island.

Ward's $25,000

Retirement pay plan of Fairchild E & A head hit by company founder.

Long-smouldering dissatisfaction with the management of the company he founded led Sherman Fairchild last week to open fire on the directors of Fairchild Engine & Airplane Corp. Battleground for any action may be the annual meeting in Hagerstown this Wednesday.

Point of attack is the management contract of J. Carlton Ward, Jr., corporation board chairman and until last year its president. Specifically, Sherman Fairchild objects to the contract's provisions that Ward, upon retirement, may draw as high as $25,000 a year for life. Fairchild charges, and the corporation denies, that the directors failed fully to inform the stockholders of details of Ward's contract and its possible long-term effect on earnings.

▶ **Target**—Sherman Fairchild insists that a letter be sent to stockholders, voicing his objections to Ward's contract, is not a personal attack upon Ward.

But there is little doubt that Ward himself is the target of what last week loomed as a possible proxy fight or court action. The reply of the corporation, signed by President L. B. Richardson, frankly stated that "if Mr. Fairchild's demands were met the company would probably lose Mr. Ward." Sherman Fairchild is understood to recognize that possibility.

Opening shot of the battle was Sherman Fairchild's letter to stockholders of the corporation asking them to return a postcard indicating either approval or disapproval of his opposition to Ward's contract. By early last week, Sherman Fairchild's office claimed, stockholders representing about 122,000 shares had indicated they agreed with his objections.

▶ **Odds Against**—Fairchild plans to present the results of his poll at the annual meeting this week. Odds are against his being able to affect any changes immediately. Fairchild E & A has about 10,245 stockholders of record, with 2,308,817 common shares outstanding. Sherman Fairchild holds 95,679 shares, or 4.14 percent, and is the largest individual stockholder.

Measured against this are sizeable blocks of stock believed to be held by investment firms which could easily be influenced by the corporation's favorable earning record (dividends paid every year since 1939, except 1946-1947). Spokesmen for Sherman Fairchild last week said he would not determine his course of action until results of his stockholders' poll were in. But both a proxy battle and court action were mentioned as possibilities. Because of the short time remaining before the annual meeting, an effort to get proxies is not considered likely.

▶ **Contract Background** — In 1940, Ward, then vice president of United Aircraft Corp., was hired as president of Fairchild E & A to "strengthen the management," as it is expressed in the corporation's reply to Sherman Fairchild's letter. Sherman Fairchild then was chairman of the board and approved Ward's original contract which provided for base pay of $35,000 per year, plus 4 percent of earnings above a certain figure.

The contract was changed while Fairchild still was chairman, one revision decreasing Ward's total pay and providing for a flat $25,000 termination payment.

Sherman Fairchild resigned in October, 1946, reportedly because he was not in sympathy with Ward's policy of stressing military business over commercial business. Last year the contract was changed to eliminate the termination pay, and to provide for what the corporation terms "deferred compensation" of $32,500 a year upon his retirement. In December, 1948, this amount was reduced to $25,000.

▶ **Arguments**—Arguments on the Ward contract run like this:

Fairchild: The contract commits the corporation to large annual payments whether business is good or bad, and these payments exceed any salary reduction. The corporation should have a retirement plan for all employes, not just the chairman of the board.

Corporation: Ward took a cut in salary; and the retirement pay is partially to make up for that, partially tie him up for his lifetime as the contract forbids him to work for a competitor even after retirement. Under certain conditions, no money would be paid after Ward left the company and in that case his salary cut saves money for the stockholders.

Fairchild: The company was built by teamwork, not by Ward.

Corporation: Ward is primarily responsible for the excellent financial health of the company (it has made a profit every year he has managed it), and he has led the company into the great new field of atomic energy.

Fairchild: The stockholders were given no chance to pass upon the contract. It was voted only two weeks before the April, 1948, annual meeting, and could have been delayed for submission to stockholders "as many other companies have done."

Corporation: The directors have the right and power to enter into such contracts as Ward's, it is common practice in industry, and the stockholders have been given "the essential and up to date facts in the 1949 proxy statement."

Mid-Continent and Parks to Merge

Warning by the Civil Aeronautics Board that its franchise will be withdrawn unless it starts scheduled operations before the end of 1949 (AVIATION WEEK, Mar. 21) has apparently prodded Parks Air Lines into a merger with Mid-Continent Airlines.

The carriers have entered into a tentative agreement—subject to CAB approval—under which Parks' feeder route structure will become the wholly-owned subsidiary of Mid-Continent.

J. W. Miller, MCA president, has stated that Oliver L. Parks, president of the feederline and founder of Parks College of Aeronautical Technology of St. Louis University, would not only retain his interest in the company, but would serve on the board of directors of both carriers. Miller also pointed out that the feederline would operate under its own name.

▶ **Chicago First**—Under the proposed agreement, the subsidiary initially would begin scheduled flights into Chicago over separate routes from Sioux City, Ia., and St. Louis, Mo. Service over the rest of Parks' certificated routes would follow as soon as practicable.

On the Sioux City-Chicago run, intermediate stops would be Fort Dodge, Waterloo and Dubuque, Ia., and Janesville-Beloit, Wis. MCA currently serves only Sioux City and Waterloo.

The St. Louis-Chicago run would have intermediate stops at Springfield, Decatur and Champaign-Urbana, Ill. At present, there are no scheduled flights from any of these points.

Miller thinks DC-3 service to those cities having adequate airport facilities could be started within sixty days after CAB approval.

Bartow Rights Sold

Patent rights to the Bartow airport lighting system were acquired last week by The Wellsbach Corp., Philadelphia, through what company representatives termed an "amicable" arrangement between Wellsbach, J. B. Bartow, the inventor, and Line Material Co., which manufactures Bartow lights.

Purpose of the agreement, say sources close to the transaction, is to make the Bartow system more generally available. The arrangement, final details of which were being worked out last week, is expected to benefit all three principals. Wellsbach is a leading manufacturer of utility and street lighting and maintains gas and electric street lights in such large cities as New York, Philadelphia, Chicago and Baltimore.

FINANCIAL

Effect of Tax Credits on Earnings

Revenue law provisions, plus renegotiations and profit ceiling make manufacturers' future results uncertain.

The aircraft manufacturing industry had a highly successful 1948, according to compilation of the annual reports issued thus far. Net earnings of the group probably reached about $14 million. This same group of 15 aircraft and engine manufacturers experienced a net loss of $32,903,000 during 1947 and slightly more than $3 million for 1946.

The losses in previous years were reduced materially through tax carry-back credits. For example, without such credits, the group's net loss for 1947 would have reached $116,438,000.

By the same token, 1948 net earnings for some companies were increased by the operation of the carry-forward provisions of the tax regulations. For example, Republic Aviation would have had to pay a federal tax of $1,036,827 on its 1948 operations were it not for the carry-forward credit. Instead, it was able to apply against 1948 income that part of its 1947 loss which was not previously offset by tax credits. In this manner, a reduction of $405,908 in tax payments for 1948 was effected.

▶ **How Credits Grow**—The workings of these tax credits, while very involved, have proved most helpful to the aircraft industry. At the conclusion of the war, two distinct credit features were working for the industry in cushioning a sizeable segment of conversion losses. The first was the long-standing right to carry back losses in current years to obtain credits on taxes of previous years. The second was refunds against wartime excess profits taxes.

Although these latter credits now have been exhausted, the same principle continues to operate in a new guise. In other words, preceding year's losses can be carried forward to apply against later tax liability.

For example, losses incurred during 1946 and 1947 could be applied against profits of subsequent years before the imposition of the regular tax rates. Of course, the carry-forward feature is limited to the extent of the losses involved and once completely offset by subsequent profits, is no longer effective.

▶ **Companies Helped**—Most of the aircraft companies exhausted their tax credits during 1948. In addition to Republic, others benefiting by this feature included Lockheed and Boeing.

The Glenn L. Martin Co. and Consolidated Vultee Aircraft Corp. both experienced substantial losses last year. Should operations prove profitable for these companies during the current year or even for 1950, material tax benefits will be available to them through this carry-forward device.

The entire question of tax adjustments subjects all published aircraft annual reports to important qualifications until final determinations are made.

▶ **Results Could Change**—For example, for the year ended Dec. 31, 1948, the Martin company reported a net loss of $16,710,762. A footnote in the report calls attention to the refund of $21,003,479 claimed as a result of 1947 losses. During 1948, the company received a "tentative" award against this claim amounting to $18,304,478, leaving an unrecovered amount of $2,699,001 at Dec. 31, 1948 subject to further adjustments.

Another case which may show the opposite extreme is found in the published reports of Curtiss-Wright Corp. As of Dec. 31, 1948, the company shows a provision for federal taxes amounting to $18,151,430. In this instance, attention is called to the fact "While it is believed probable that at a later date a substantial portion of the amount provided . . . for federal taxes for years prior to 1948 may be restored to surplus, the amount thereof is not presently determinable."

Lockheed declared that its federal income tax liability for the years 1940 to 1948 has not been finally determined. The examination by the Bureau of Internal Revenue of the returns for the years 1940 to 1945 is not yet completed.

However, the Lockheed management believes that its accrual of $5,260,000 for federal taxes on income as provided as of Dec. 31, 1948 is adequate to meet any deficiencies of tax and related interest that may be asserted for all years not yet settled. Nevertheless, until final determinations are made, a serious doubt remains.

Grumman Aircraft probably shows the most clear-cut tax treatment on its balance sheet. All tax returns for the years up thru 1945 have been settled. Moreover, the company is making a claim for carry-back tax credits for the years 1940, 1941 and 1942 but has not reflected such claims as an asset in any of its financial statements.

Moreover, Grumman has also made provision in its 1948 accounts for an estimated refund of profits on uncompleted contracts under the Vinson-Trammel Act. This provision amounted to $520,000 and reduced reported net income by a corresponding amount, resulting in Grumman's published 1948 net profit of $2,393,311.

▶ **Profit Limitation**—It is this same limitation through legislation enacted last year which adds another major qualification to the present trend of earnings of the aircraft industry.

The Renegotiation Act of 1948 specifies that all procurement resulting from fiscal 1949 funds is to be subject to renegotiation. Deliveries in 1948 were hardly touched by this regulation. With the exhaustion of past awards, however, fiscal 1949 orders will soon be billed and subject to this redetermination.

Other profit barriers exist in the Vinson Trammell Act. This legislation limits its profits to 12 percent before taxes on sales, although it does not provide for any guarantees that earnings will reach that level. Here again, while industry and impartial observers are in agreement as to the fairness of this provision, cumbersome interpretations have proved very harmful.

▶ **Untested**—The renegotiation processes have yet to be tested under existing legislation. Yet, a series of natural objections are evident. The aircraft industry is unlike most standard manufacturing enterprises and is essentially a contracting business. As such it is subjected to peaks and valleys. Fair-minded observers believe that any renegotiation process should be averaged over a period of years, giving effect to this peculiar characteristic of the industry, rather than confined to any one year.

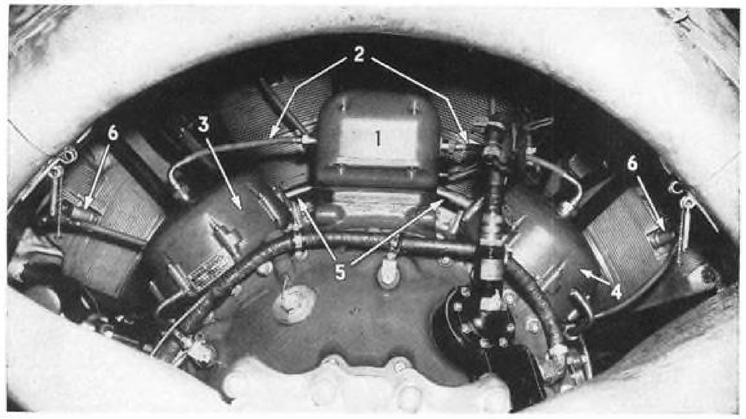
There is no complete set of precedents to guide the individual renegotiators. No definite percentage of profits is spelled out as being desirable, but the individual renegotiator is permitted to use his discretion. This, in itself, may defeat the entire purpose of this profit-limitation legislation as in some cases greater earnings may result while in others too-severe cutbacks may be imposed on profits.

Until these uncertainties surrounding tax determinations and profit limitations are clarified, very important qualifications must attend the current operations of the aircraft industry. For these and similar reasons, it may be a mistake to assume that the same level of earnings will prevail for the industry during 1949 that existed last year. Of greater importance, there is no certainty that the individual units in the group will repeat during 1949 last year's pattern of profit or loss.

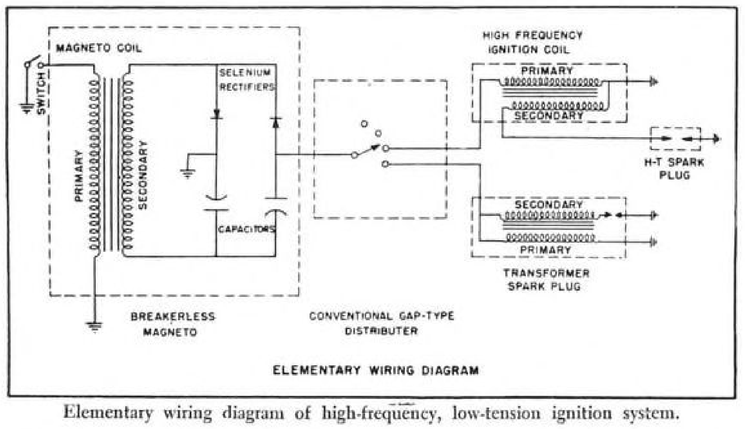
—Selig Altschul

ENGINEERING

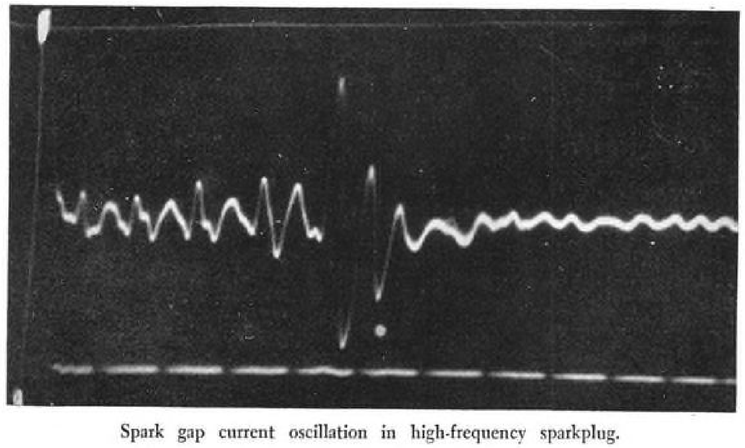
Case For High-Frequency Ignition System



Closeup of GE high-frequency ignition installation: 1. Dual 18 magneto; 2, low tension leads, magneto to distributor; 3 and 4, right and left distributors; 5, harness manifold ring portion of radio shielding assembly; and 6, transformer sparkplug.



Elementary wiring diagram of high-frequency, low-tension ignition system.



Spark gap current oscillation in high-frequency sparkplug.

Low-tension installation intended to offer relief from high-tension ills.

By C. J. Watters*

A new breakerless, high-frequency, low-tension ignition system for aircraft aimed at overcoming the limitations of present-day installations is being introduced by the General Electric Co.

One design of the system, 40 percent lighter than conventional high-tension installations, is being evaluated in flight service on a Convair-Liner by Pan American Airways, and other designs are now in the advance stages of development.

This system has the features shown in the accompanying wiring diagram, which overcome several of the serious shortcomings of high-tension ignition.

The new arrangement consists of a simple magneto-distributor combination or magneto and separate distributor, capable of furnishing high-frequency, low voltage impulses to each sparkplug through a low-tension radio-shielded harness. It is available with either high-frequency transformer-type sparkplugs or individual high-frequency coils for use with conventional high-tension plugs. Either type has a spark discharge frequency of approximately 1.5 mc.

► **Operating Difficulties**—With increase in size and power of piston engines during the past ten years, conventional high-tension ignition systems have been exceptionally hard pressed to provide satisfactory performance.

Demand for increased sparking voltage because of high engine powers, more loss of spark energy from increased distributed capacitance of radio shielding, and other items such as corona loss or flashover at high altitude have caused these systems to become very large, heavy, and not very efficient in transfer of magnetic to spark energy.

Operation of engines with highly leaded fuels under extreme mixture and ambient atmospheric conditions with wide ranges of engine power settings has exacted more demanding performance, not easily met by any ignition system. Thus, flight delays and maintenance expense stemming from ignition, particularly sparkplugs, rank high on the list of powerplant complaints with most airline operators.

The growing performance and maintenance demands on high-tension ignition were brought forcibly upon the ignition industry during the war, when it became necessary to change sparkplugs at ridiculously short periods to provide reliable system performance. Thus, stemming from developments in search of relief from the ills of high-tension systems, breakerless, high-frequency ignition with low-tension distribution has evolved as the most practical solution.

An 18-cylinder engine requires 2¼ million accurately timed sparks per hour of cruising operation. It is expecting a great deal of a breaker-timed system to deliver 2¼ billion accurately timed sparks before any adjustments, lubrication or replacements are allowed, but that is exactly what is expected. Nearly 300 million sparks from each of four ignition systems were required for the recent non-stop flight around the world.

► **Size, Weight Aspects**—For radial engines, timing compensation on most cylinders is required. This causes breaker-timed magnetos to be heavier than necessary, since for most cylinders the breakers must open at other than maximum flux and voltage conditions. The extra energy on cylinders having the least compensation causes greater sparkplug electrode erosion.

High-tension magneto designs for engines having 24 cylinders or more, assume barrel-like proportions when adequate flashover paths are provided. Obviously, low-tension distribution would reduce size and weight and provide satisfactory altitude operation. However, unless combined with a high-frequency circuit, a straight low-tension system requires rather large individual transformer coils for stepping up sparkplug voltage.

► **Sparkplugs Considered** – Sparkplugs have been the chief source of trouble with high-tension systems, although blame is frequently attributed to these units when other ignition and engine troubles are at fault.

Changes in sparkplug electrode geometry and materials have provided improved lean mixture ignition on some engines. Platinum-thorium electrode alloys and resistors built into the sparkplug center wire have provided considerable reduction in electrode erosion rates.

On high-tension systems operators have found that certain engines require less masking of the spark than conventional .012 massive electrode plugs provide. Some have also found that improved lean mixture firing can be obtained with fine wire electrode plugs or by opening the gap to .020 or .030 on massive electrode plugs. On certain engines not having especially lean carburetor settings or maldistribution, massive electrode plugs operate satisfactorily from the lean mixture firing standpoint, particularly when initial gap settings are above .012.

Thus, from the economic standpoint of sparkplug operation, it is desirable to determine which electrode configuration provides both satisfactory performance and life.

► **Plug Improvements** – Difficulties encountered with carbon and lead fouling on the larger engines have been the underlying cause for other major sparkplug improvements, such as providing longer leakage path to ground over the nose of the core insulator.

Other design changes and improved ceramic material have provided exceptionally uniform quality by maintaining heat ratings of any one plug type within a very narrow range. This allows operators to select the hottest running plug to prevent carbon fouling without getting an occasional burned piston from preignition caused by one plug running too hot.

While hot running plugs reduce carbon fouling fairly well, particularly if idle mixtures are not too rich, they have comparatively shorter and less reliable life because they are incapable of withstanding combustion temperatures as well as do colder running plugs.

These plug improvements plus others in magneto and harness design have afforded some relief from growing problems in high tension ignition. It is significant today, however, that no high-tension system can operate reliably at high altitude unless plugs are removed for cleaning and gap setting every 25 to 100 hr. to prevent flashover occurring somewhere in the system.

Hence, the standard way of alleviating most high-tension ignition difficulties during the past ten years has been to add energy to the magneto, increase its size for added flashover resistance, pressurize the system and maintain electrode gaps at a minimum clearance by frequent resetting.

► **Electrode Settings**—Even with these changes, leakage current streamers are readily visible at sea level pressure on systems returned for overhaul. Frequent cleaning of sparkplug insulators and terminal wells has been necessary to remove carbon and lead deposits and prevent high electrical losses. Literally millions of otherwise good plugs have been thrown away because of high electrical leakage.

One-piece insulator plugs will help this condition by eliminating one troublesome leakage path, but unless high-altitude-type terminals are provided for both sparkplugs and other high voltage connections in the harness, electrode gaps will still have to be reset frequently for high altitude operation.

If a choice in electrode settings were possible, few would choose the present .012 initial setting as providing optimum lean mixture ignition. The automotive industry is thoroughly cognizant of the superiority of .025 to .040-gap settings and can get away with them because of near-sea-level operation of the ignition systems. Since it is generally accepted that wide electrode gap settings afford the best ignition of lean mixtures the reasons for this phenomenon are pertinent.

In addition to whatever benefits may be derived from the fact that more free ions and activated molecules exist in wide gaps, other important electrical discharge characteristics are obtained. As the gap is increased, more energy is stored in the secondary distributed capacitance and less in the inductance of the coil. The gap will, therefore, break down at a high sparking voltage with a much larger portion of the total energy being dissipated across the gap as capacitive current.

Supporting the belief that rate of energy dissipation rather than total energy in the spark is the more important factor contributing to good ignition, is the fact that series resistors of 10,000 ohms can be inserted in the plug which damp out the inductive component without affecting ignition ability, and in addition, provide a reduction in electrode erosion rates up to 50 percent.

► **Misfiring**—Basically, .012 settings are selected for aircraft engines to keep sparking voltage demand at a minimum and thus reduce electrical stress in the entire system. By starting with a .012 initial setting, the effect of rapid electrode erosion rates encountered with high-tension systems is reduced.

Sparkplugs frequently misfire, however, because of changes in the insulation resistance of their various shunt current paths to ground caused by lead, carbon, moisture or ice accumulation on the firing end of the plug, or as a result of other contamination creating low insulation resistance in the plug terminal well, harness, or distributor.

High-tension systems normally misfire when their insulation resistance falls below 100,000 to 200,000 ohms depending on gap spacings and the condition of other parallel leakage paths in the system. Unfortunately, operating conditions frequently cause this low resistance to occur.

The new high-frequency system will normally fire sparkplugs with shunt resistances as low as 3000 ohms, which is far better than can be expected with any system not incorporating a high-frequency discharge circuit. Advantage of high-frequency spark discharge in firing partially fouled plugs is proving itself in

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flight service on the new system.

▶**Spark Details**—As a result of experience with high-tension ignition, a widely accepted and ill-founded concept has developed that ignition ability of a spark is largely the result of its inductive component and total amount of energy dissipated.

It is believed that the inability of high-tension systems to supply all the losses encountered along the distribution line and yet have sufficient voltage and power to ignite the fuel under widely varying conditions, has led us to judge the performance of a magneto by determining whether or not it is of the "ball-of-fire" variety.

In light of recent experience with high-frequency and low-tension ignition it can no longer be accepted that a good ignition spark must have high total energy and the characteristic fuzz of a highly inductive spark such as produced from the ball-of-fire variety of magneto.

Actually, it is now believed that a large portion of the arc-like discharge of inductive spark energy occurs after ignition takes place and is actually detrimental in that its current discharge increases electrode erosion rates.

Since some spark volume must be raised to ignition temperature, the spark energy dissipated in the electrode gap must be sufficient to raise the temperature to about 1300-1500 F. Once the voltage has broken down the gap, the rate of current discharge is the principle factor in raising the temperature. Thus if electrodes are of relatively large mass causing rapid gap cooling, more current dissipation in the arc is required to reach ignition temperature at low discharge frequency.

In connection with the development of an improved system, General Electric has investigated the electrical transients involved in various spark discharges. This was to obtain the most efficient transfer of system energy and to better understand the ability of relatively low energy, high-frequency spark discharges to fire various fuel-air mixtures as well as high-tension ignition of more than three times greater spark energy.

Assuming a point source of ignition, particularly from the thermal theory, the greatly increased rate of energy dissipation and exceptionally high current discharge offer a plausible explanation of this ability of high-frequency spark discharges to initiate combustion.

▶**Oscillograph Studies**—High-frequency current oscillations occurring in the new system as viewed on GE's high speed oscillograph appear not too different from those of high-tension spark discharges except for duration. There are several oscillations of very high capacitive current and very little inductive are noticeable.

This can be seen in the accompanying photo showing high-frequency current oscillations occurring in the gap of a typical transformer plug at the end of a long shielded lead. The high rate of capacitive current discharge raises gap temperatures rapidly and is thus conducive to reaching ignition temperatures with a minimum of heat lost to electrodes and through low shunt resistance current leakage.

In effect, the ability of high-frequency to ignore low shunt resistance makes more efficient use of the current available to initiate combustion and, more important, prevents misfiring of partially fouled plugs.

While high-frequency is no panacea for all lead-fouling difficulties, results of tests indicate it will be a great help.

▶**System Description**—Some exceptionally lean mixture running has recently been completed with a breakerless, high-frequency ignition system having less than ⅓ the average spark energy of conventional high-tension systems. This system is unique in its simplicity as compared to high-tension designs available for high-powered engines.

The magneto has a lightweight dual magnetic circuit which, by the use of a number of narrow, parallel poles, produces the required speed-voltage characteristics without the use of breaker points. This magnetic circuit induces two opposite-polarity electrical impulses of approximately 1600v. in the coil winding for each time that a plug fires.

A simple voltage-doubler circuit connects each magneto coil with its distributor capacitor through small selenium cell rectifiers (see wiring diagram). This energy storage feature halves the weight of the magnetic circuit for a given spark energy.

The rectifier circuit holds the charge on the capacitor momentarily until the rotating distributor electrode aligns with a stationary one, at which time the stored energy is discharged at high-frequency through a conventional jump-gap distributor. All timing is accomplished by the simple and dependable means described above.

Approximately 3200v. are distributed to each transformer sparkplug through a lightweight, low-tension harness. With relatively low voltage distribution, capacitance loading losses in the harness are low. This feature, together with the very small distributed capacitance of the sparkplug secondary circuit, keeps electrical losses at a minimum, making a high percentage of generated voltage and current available at the plug electrode gap.

▶**Plug Type, Erosion Rates**—The Champion Spark Plug Co.'s HF-57 type transformer sparkplugs used with the new system have a very small high-frequency coil installed within the plug in a design which bottles up all high voltage within a one piece core insulator.

The coil is vacuum-pressure impregnated with a high temperature insulation and is hermetically sealed by a Fernico-glass terminal.

All plugs are required to pass a minimum of 15kv. peak output voltage at 60,000 ft. simulated altitude. (Plugs now being developed will produce nearly 20kv. at 80,000 ft.). This severe test insures well insulated plugs and their output voltage is well above sparking voltages required with the highest cylinder boost pressures.

Electrode erosion rates experienced on engine test and flight operation have been ½ that normally encountered with high-tension systems. Successful lean mixture operation with .012 electrode gaps has been obtained, but in contrast to high-tension systems, high-frequency systems do not require settings below .020 to provide adequate altitude performance and long periods of operation before electrical erosion increases the gap enough to cause misfiring.

Cold-running high-frequency plugs operate equally well in cylinders normally requiring hot-running plugs to prevent fouling. This experience with cold plugs is limited but it is antici-

pated that future flight service will substantiate these preliminary indications.

► **Benefits Claimed**—Summarizing the advantages of the new system over those not incorporating high-frequency circuits, these factors are considered important:

- Weight is reduced. Weight economies as high as 50 percent are obtainable.
- There are no breakers. Maintenance on breaker points, cams, and lubrication wicks is not necessary, and equal energy is supplied to all plugs with negligible timing change in service.
- Electrode erosion is cut down. Reliable performance for long periods without maintenance is now possible because of very low erosion rates.
- Carbon, and lead fouling difficulties are substantially reduced. High-frequency will fire plugs in the presence of either transient or constantly low shunt resistances providing they do not fall below 3000 ohms.
- Simplified installation and maintenance are afforded. Internal magneto timing is eliminated and magneto-to-engine timing simplified. Compact and interchangeable units of a minimum number per engine are provided which require little or no adjustments between engine overhauls.

No lubrication is necessary except at engine overhaul.

No special tools or winterization are required.

A simple ventilation system is provided and radio noise joints are held to a minimum.

The system is relatively unaffected by atmospheric changes.

Portable Instruments

New a.c. and d.c. portable instruments announced by Weston Electrical Instrument Corp., 617 Frelinghuysen Ave., Newark 5, N. J., feature non-breakable window extending full width of unit, curving around each side to reduce shadows and providing bright illumination of 5½-inch scale. Equipped with hand-calibrated mirror scales and knife-edge pointers, both a.c. and d.c. types are shielded against external magnetic fields. It's stated that d.c. devices have new self-shielding mechanism providing such high protection that magnetic field created by conductor carrying 7,000 amp. at distance of 3 ft. causes error in indication of less than ½ percent of full scale value. Available are d.c. voltmeters, volt-ammeters, ammeters, milliammeters and microammeters; and a.c. voltmeters, ammeters and milliammeters. Series of a.c. rectifier type instruments, voltmeters and milliammeters, have accuracy within 1½ percent.

How Chance Laws Cut Production Costs

Statistical quality control is new technique permitting substantial savings, close designer-shop coordination.

More than 1200 U. S. firms are cutting production costs by "taking a chance." By placing their faith in the roll of the dice, they have taken up their position behind the table, where the odds are better than in front of it.

Although production men have long paid lip service to statistics as the ultimate infallible proof, the application of statistical quality control has required extensive education and promotion work on the part of statisticians to convince management that figures really don't lie.

The new system consists, simply, of eliminating all but the "natural" deviations of machine tools in the production of parts and leaving the tolerances required for assembly entirely up to chance.

Thus, the boldness of the new system is apparent, for its acceptance requires a manufacturer to throw out 100 yr. of "precision" design and fabrication experience that has been based on a system wholly antithetical to the new one.

▶**How System Works**—First step in the new process is the preparation of a control chart for each machine required in the fabrication operation. This type chart was first designed by Dr. W. A. Shewhart, Bell Telephone Laboratories, in 1924. By carrying results of small groups of measurements, rather than individual piece readings, it indicates the "natural tolerance" of the lathe, grinder, etc.

The operator periodically plots sample results of his work on this chart as production progresses and so long as only those factors inherent in the machine are at work, the tolerance of the finished parts will remain within the natural limits. As soon as the operator notices a sample that exceeds this tolerance, he knows that something is wrong and makes the required adjustment.

Thus, waste material and "rejects" are reduced to a minimum and, as will be shown shortly, virtually all of the parts produced by this machine will be useable on assembly.

Once the "natural tolerance" of the machine has been established with accuracy, then no further reductions can be made practically and recognition of this fact prohibits exorbitant tolerance demands being made upon it that only increase rejected parts and run up costs.

▶**Machine Setting**—The various factors at work on a machine in operation combine in various ways to produce various errors in the finished part.

Thus, it is possible that they will combine to cancel out their effects during an operation, resulting in the production of a perfect part. It is also possible that they will, by chance, accumulate adversely, producing the worst possible part.

The adverse accumulation of inherent variables can be either toward the large or small size, and between these two extremes lies an average that is taken as the setting of the machine. The deviation of the output of the machine from this average or setting follows a natural law of chance that is shown graphically in Fig. 1.

The standard deviation is defined as the square root of the arithmetic mean of the squares of the deviations from the mean, or, the root-mean-square value. Plus and minus three standard deviations are taken as the natural tolerance of the machine, since they will include 99.7 percent of all the values.

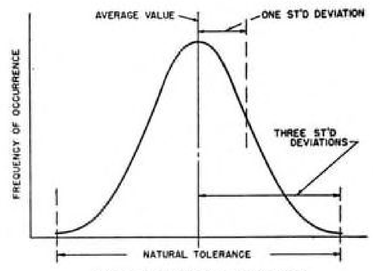


Fig. 1. Normal curve of the natural tolerance of a machine versus the number of identical parts produced.

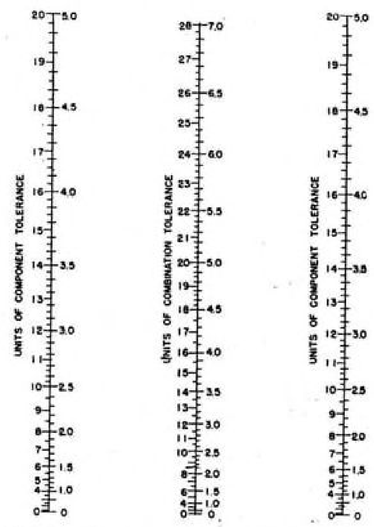


Fig. 2. Nomogram for combining tolerances statistically.

Thus, if six standard variations are taken as the natural tolerance of the machine, it then follows that the machine will produce a part with a greater tolerance only 0.3 percent of the time, or a little less than one-third of one percent.

▶**Nomogram**—Since the main purpose of many tolerances is to guarantee satisfactory assembly, it is in the assembly operation that the new chance laws are proved. To provide engineers with a readily-useable tool, Mr. Dorian Shainin, chief inspector at United Aircraft Corp.'s Hamilton Standard Propeller division, prepared the nomogram shown in Fig. 2. This plots the units of component tolerance on the right and left and the units of combination tolerance in the center.

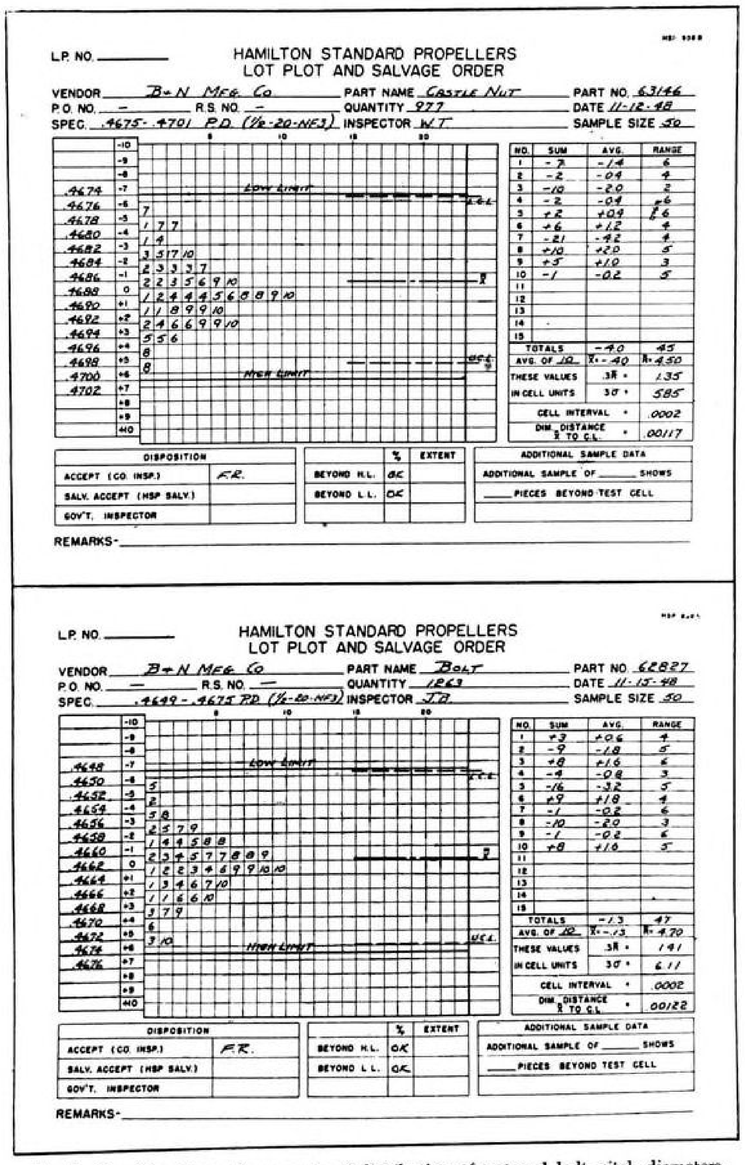
To illustrate the astonishing new chance laws, a typical threaded connection is chosen, the SAE ¼-20 class 3 thread, which permits a tolerance of 0.0026 for each component, or a total variation from size on size to 0.0052 loose.

To determine the total tolerance of this fit, based on machines using control charts, place a straightedge against 2.6 on both the left and right lines of Fig. 2 and read 3.69 from the middle line.

This means that if the screw machine used to produce the parts was just capable of meeting the 0.0026 tolerance on the bolt and nut, and control charts were maintaining the average size of each at the midpoint of their respective tolerance ranges, the assemblies would vary from 0.00075 loose to 0.00445 loose. The difference between these values is 0.0037, actually used tolerance. Accordingly, a total of 0.0015 or about 35 percent of the allowed assembly tolerance would never be used, for all practical purposes.

Another amazing result obtainable from Fig. 2 is to compare this statistical tolerance for a class 3 fit with that required for a class 2 thread. Place the straightedge horizontally on the middle line of the nomogram at 0.0052 (5.2) and read 3.7 (0.0037) on either side as the allowable natural tolerance for each component. The standard SAE tolerance for each component of a ¼-20 class 2 thread is 0.0036, which means that the use of control charts will allow you to get class 3 assemblies at class 2 prices!

▶**Application**—To see just how well


L.P. NO. _____

HAMILTON STANDARD PROPELLERS
LOT PLOT AND SALVAGE ORDER

VENDOR B+N MFG CO — PART NAME CASTLE NUT — PART NO. 63146
P.O. NO. — R.S. NO. — QUANTITY 977 — DATE 11-12-48
SPEC. .4675-4701 P.D. (1/2-20-NF3) INSPECTOR WT — SAMPLE SIZE 50

NO.	SUM	AVG.	RANGE
1	-3	-.14	6
2	-2	-.09	4
3	-10	-.20	2
4	-2	-.04	6
5	+2	+.04	6
6	+6	+.12	4
7	-21	-.42	4
8	+10	+.20	5
9	+5	+.10	3
10	-1	-.02	5
11			
12			
13			
14			
15			
TOTALS		-.40	45
AVG. OF 10		X̄= -.40	R̄=4.50
THESE VALUES		.3R̄ =	1.35
IN CELL UNITS		3σ' =	5.85
CELL INTERVAL			.0002
DIM. DISTANCE Σ TO C.L.			.00117

DISPOSITION	
ACCEPT (CO. INSP.)	F.R.
SALV. ACCEPT (HSP SALV.)	
GOV'T. INSPECTOR	

	%	EXTENT
BEYOND H.L.	OK	
BEYOND L.L.	OK	

ADDITIONAL SAMPLE DATA
ADDITIONAL SAMPLE OF _____ SHOWS
_____ PIECES BEYOND TEST CELL

REMARKS-

L.P. NO. _____

HAMILTON STANDARD PROPELLERS
LOT PLOT AND SALVAGE ORDER

VENDOR B+N MFG CO — PART NAME BOLT — PART NO. 62827
P.O. NO. — R.S. NO. — QUANTITY 1263 — DATE 11-15-48
SPEC. .4649-.4675 P.D. (1/2-20-NF3) INSPECTOR JR — SAMPLE SIZE 50

NO.	SUM	AVG.	RANGE
1	+3	+.06	4
2	-9	-.18	5
3	+8	+.16	6
4	-4	-.08	3
5	-16	-.32	5
6	+9	+.18	4
7	-1	-.02	6
8	-10	-.20	3
9	-1	-.02	6
10	+8	+.16	5
11			
12			
13			
14			
15			
TOTALS		-.13	47
AVG. OF 10		X̄= -.13	R̄= 4.70
THESE VALUES		.3R̄ =	1.41
IN CELL UNITS		3σ' =	6.11
CELL INTERVAL			.0002
DIM. DISTANCE Σ TO C.L.			.00122

DISPOSITION	
ACCEPT (CO. INSP.)	F.R.
SALV. ACCEPT (HSP SALV.)	
GOV'T. INSPECTOR	

	%	EXTENT
BEYOND H.L.	OK	
BEYOND L.L.	OK	

ADDITIONAL SAMPLE DATA
ADDITIONAL SAMPLE OF _____ SHOWS
_____ PIECES BEYOND TEST CELL

REMARKS-

Fig. 3. Receiving inspection records of distribution of nut and bolt pitch diameters.

these theories work out in practice, Fig. 3 shows actual records made, as a routine matter for all Hamilton Standard's receiving inspection, of ½-20 class 3 threads. From this figure it can be seen that the natural tolerance of the bolt is running 0.0024 and of the nut 0.0023 (each is twice the distance from the average $\bar{x}$ to the control limit C.L.). While it is conceivable that a nut of 0.4698 could get together with a bolt of 0.4648, giving a clearance of 0.0050, it is so unlikely to result from a chance selection of parts that it can be ruled out. The nomogram of Fig. 2 gives an assembly combination tolerance of 0.0034 for these parts and a maximum expected clearance of 0.0042, determined from the difference between the average sizes (0.4687 − 0.4662 = 0.0025) plus one-half of 0.0034 (the distance from the average clearance to the three standard deviation limit of the clearance).

The likelihood of even a clearance of this magnitude is considered to be just on the verge of being practical—it is 1.3 times out of 1000 random combinations!

► **Block Example**—The designer may well say: "Well, that's fine for two parts, but what about accumulated tolerances throughout a complex assembly?" It is this concern that has always tempted him to avoid major assembly difficulties through determining individual tolerances, so the production people say, "by thinking of the smallest number he knows and then halving it."

When statistical argument failed, the carpenter shop was called in to turn out the small blocks shown in Fig. 4. Five parts to be assembled are represented by blocks of five different colors. There is a set of blocks of each color which vary in height according to an approximately normal distribution.

If the shortest blocks of each color are stacked against the vertical board, they reach the lower solid line. The tallest ones add up to the upper solid line. Closer together within these solid lines is a pair of dotted lines which represent the "1.3 chances in 1000" extreme limits.

If the blocks are scrambled, random and repeated selections made of one of each color almost invariably results in a stack height that comes between the dotted lines. The region between these and the solid lines thus, is unused tolerance!

The designer can assign workable tolerances to components whose algebraic sum would far exceed the limits for a workable assembly. How they would add up statistically can be determined by entering Fig. 2 with a pair of values, then pairing up this resultant with the next tolerance, etc., each resultant sum always being read on the center scale. When either component tolerance exceeds 5 units, use the left side of each line instead of the right. When 20 units are exceeded, return to the right side of each line where 2.0 indicates 20, etc.

► **Close Cooperation**—This new system comprises a powerful weapon for permitting complete designer-shop cooperation and understanding.

Heretofore, designers have distributed the tolerance load among parts according to empirical rules concerned with the size of the dimension, internal or external dimensions, the type of milling, boring, grinding, etc., required for the part, etc.

In a statistically controlled shop, detailed factual data are available which will permit engineering, production, tooling, shop, etc., to work as a unit on these matters. The shop, from its existing control charts, furnishes a table of natural tolerances against the part number and dimension being fabricated, classified by equipment identification tag number. Production engineering supplies a schedule showing expected idle time on a particular machine. The nomogram of Fig. 2 should then make possible many an otherwise "impossible" job.

► **Drawings Affected**—Adoption of the statistical quality control method should be accompanied by special markings

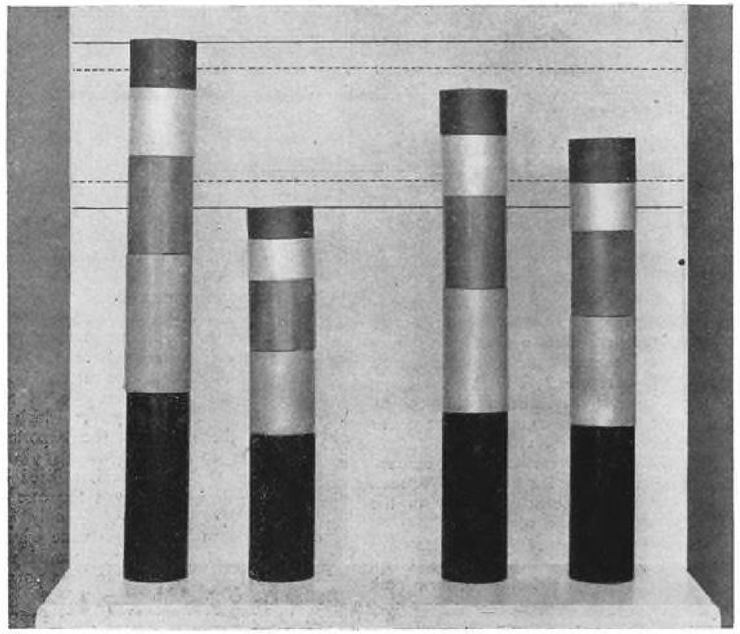


Fig. 4. Block stacks show tolerance accumulation resulting from assembly of 5 parts. Two left stacks show theoretical tolerance extremes. Band between dotted lines represents practical range as illustrated by two randomly selected assembly stacks.

on drawings, since the method is only valid when a control chart keeps the distribution free from other than natural variations and the special marking would comprise a warning that the job is not to be run without a Shewhart chart. The problem of standardizing a new drawing convention is a monumental one but one of the methods now in use is so simple yet effective as to present little problem to drafting rooms.

This is best shown by the example: 0.4662 (.0018), which is read: "0.4662 plus and minus .0018 maximum variation of individual sizes as controlled by a Shewhart chart." The first figure gives the desired average value and that included in parentheses is the maximum allowable three standard deviation variation from that average, it being understood that the parentheses denote employment of the statistical method.

This case, incidentally, refers back to the example of the ½-20 threads. The above notation for the bolt, coupled with a corresponding one, 0.4688 (.0018) for the nut, would result in a class 3 or better assembly, even though the handbook tolerance of 0.0026 for each component has here been increased to 0.0036.

This type of dimensioning will be an indication that the tolerance has been computed statistically and therefore is properly economical.

Second, it will be clear to production that they have a tolerance commensurate with capabilities and that they should not feel the constant need of asking for more tolerance.

Third, production's choice of equipment to be used can be properly guided by either using the machine the designer had in mind, a similar one, or one with even closer natural tolerance as is indicated on the control chart records on file.

Fourth, such control of rough and finished dimensions means that forgings and castings can carry less extra raw material to guarantee finishing, with resultant economies.

Finally, the most important advantage is that the dimension will average close to the standard average and the parts should all be within specification since the machine is capable of holding to those values when the Shewhart type control charts are used.

(Based upon a paper by Dorian Shainin, Chief Inspector, Hamilton Standard Propellers division, United Aircraft Corp., delivered before the annual meeting of the Society of Automotive Engineers, Detroit, Mich., Jan. 10-14, 1949.)

Tire Temperatures Noted During Runs

In-service tests, reported to be the first conducted by the Air Force or industry to record accurately the actual temperature of tires under flight condition, were made recently by the Mechanical Branch of the Aircraft Laboratory, Engineering division, Air Materiel Command.

Trials were run during takeoffs and landings with standard 47-in. tires. Knowledge of the dynamic temperatures encountered are expected to aid in establishing high-speed test criteria and afford a correlation between laboratory and flight-test performance.

Thermocouple needles were inserted in the casings at two points of anticipated maximum temperatures—the first just above the bead overlap, the second as close as possible to the deflection line at the shoulder.

Penetration was to a depth of at least half the plies and the needles were laced to the casing. Thermocouple leads were connected to a newly developed commutator which operated a potentiometer in the cockpit.

Temperatures, measured prior to takeoff and every 5 sec. during takeoff run, rose 9 F. at the shoulder and 12 F. at the bead.

Cooling was accomplished by flying at 3000 ft. at 160 mph. with gear down for 30 min.

In landings at touchdown speeds of 115 mph., average temperature increase was 35 F. at the bead. Light to moderate braking was used during landing rolls and readings taken every 5 sec.

Additional taxi tests were made to determine the "equilibrium speed" at which tire temperature tend to stabilize—no build up or cool-off. At 30 mph. the temperature stabilized at 126 F.

The test procedure, found to be practical and reliable, is likely to lead to further, refined investigation. It is anticipated that improved thermocouple needles permitting crown temperature measurements soon will be available.

Additional experimentation is planned at higher speeds and loads and on jet craft.

No-Scratch Cleaner

A scouring process employing powdered plumstones and compressed air to clean aircraft engine parts without danger of scratching is used by KLM Royal Dutch Airlines at Schiphol Airport.

Cleaning is done in a soft grit installation which directs a fine stream of the powder under pressure of six atmospheres against the soiled surfaces.

During the operation, dirt and grease are separated by suction from the powder, which is re-used. Cleaning time is about 20 min.

LETTERS

Powerplant Failures

Mr. Weick's excellent article in the Mar. 7 issue clearly spotlights the carburetor as the source of half the lightplane powerplant failures. While he points out the tremendous fundamental advantage (lack of icing) the fuel injection system holds over the carburetor, we must recognize that mixture control with the injector is much more necessary than it is for a carburetor.

It is unfortunate that the light aircraft industry is unable to foot the bill for developing a proper automatic mixture control for the injector. I understand from Air Force sources that the most critical current problem in fuel injection is the extreme precision required in the injector parts, such precision being exorbitant because of the present small volume of sales.

T. J. Harriman
Bell Aircraft Corp.
Buffalo 5, New York

Bonanza vs. Navion

The Mar. 21 Aviation Week, "Contest Pits Bonanza vs. Navion," relates how a two year old Navion apparently bettered the performance of "a fairly new A35 Model." This type of article has both great interest and effect upon potential purchasers and I hope I am wrong in the impression that your weekly is slightly negative towards the Bonanza. This feeling was generated by your rather tepid article on Odom's flight (which could not have been made in a competitive plane), together with your Bonanza vs. Navion article.

On March 15, a "take off and climb" competition took place at Rosemead Airport, Rosemead, Calif. (Los Angeles suburb) between a Navion, NC91502, and Bonanza, NC80457, owned by Shepherd Tractor & Equipment Co. The Bonanza was the 57th built by Beech, and was a standard factory model except for additional blind flying equipment. The Navion is owned by Merlin Simon who has done extensive development and work on the popular spinners, wheel enclosures, Beech type exhaust manifolds, cowl flaps, gasoline tank covers and wheel discs for the Navion. His Navion was so equipped, and in addition the mounting step had been removed to aid performance.

With a 10 mile estimated wind down the runway, the two ships took off simultaneously. Mr. Simon stated that the Navion propeller was set for 2600 rpm. on takeoff, while the Bonanza turned 1960 rpm. on the ground. Bonanza had pilot and passenger, while Navion had pilot only. Bonanza tanks contained 20 gallons—Navion tankage unknown. A crew painting another Navion under Mr. Simon's direction witnessed the contest, together with Rosemead airport attendants and the usual onlookers. The Bonanza was airborne three seconds prior to the Navion and the Navion was unable to follow the steep climb of the Bonanza so that when the Bonanza had reached 1000 ft. the Navion was approximately 300 ft. directly below. No wagers were made, but Merlin Simon was a good sport about the contest and later remarked to the undersigned, "you certainly put me in my place." He also evidenced interest in the purchase of a used Bonanza similar to NC80457.

In my personal experience the only way to compare performance characteristics of aircraft is to find suitable space where simultaneous performance may be observed. While your Mar. 21 article states, "both are powered with a C185 engine," I am sure you realize that the power which is taken from the engine is the important factor.

If 205 hp. at 2600 rpm. is utilized by the Navion—as I suspect was the case in the Albuquerque contest—it is only fair that the Bonanza be given in same advantage, although perhaps Beech would not recommend such strenuous use for a powerplant.

As to landings, with 43 deg. of flaps it would appear logical that a Navion could initially touchdown closer to an obstacle, although my experience with both ships suggests that the short wheel base of the Navion greatly reduces braking action, as the weight of the ship is transferred rapidly from main to nose gear. In addition, the individual wheel brakes of the Bonanza allow more effective braking.

Incidentally, on page 64, Mar. 21 issue, "More Navion Business Users" you quote reports from Navion business users, Guntert & Zimmerman. These people are customers of ours, and I believe disposed of their Navion sometime ago in favor of a Cessna 195.

This is the first time I have ever written in defense of an airplane or any similar product, but our own experiences with the Bonanza in some 640 hr. of use, compared with anything we have owned or known, suggests that this outstanding little airplane should be given every break it deserves, including favorable publicity!

W. W. Shepherd, General Manager
Shepherd Tractor & Equipment Co.
Los Angeles, Calif.

Odom Achievement

I have read your editorial on Bill Odom's flight, "Stunt or Achievement?", in the Mar. 28 Aviation Week and find it very interesting. I am most hopeful that all negative-minded people read it and take it to heart.

O. A. Beech, Secretary-Treasurer
Beech Aircraft Corp.
Wichita, Kansas

He Bets On United

Your editorials have always been worth reading, and I have gathered that you are willing to back them up. Referring to yours of today, "Which Will You Bet On?" (Mar. 28, Aviation Week), I'll take a flyer that United Air Lines does not institute coach service within six months.

You seem to be overly concerned about how United will fill its big new transports without fare cuts. Although you specifically mention delivery of the fleet of Stratocruisers, I presume you include the DC-6s because they outnumber the former five to one. According to your own report United is going to show more than a 15 percent increase in passenger mileage for the first quarter of 1949 over the same period in 1948.

Since the second and third quarters have always been the lush months in air transportation, it appears to me that United would pick a dull season to launch "coach rates", and that certainly is not within six months.

Someday some non-air traveler who has read your repeated reference to "one class luxury service, complete to full course meals" is going to be disappointed on his first flight, because the meal will be served on a cardboard tray in one swish.

Please advise if we have a bet, and name your stake. Mine will be a lifetime subscription to Aviation Week.

D. E. Dean
900 Warrington Place
Dayton, Ohio

Instrument Ratings

I read with a good deal of interest and approval, the letter Mar. 14 from I. H. Montgomery of Aviation Training Enterprises in Chicago, regarding instrument ratings.

I have always been of the opinion that the present regulation to keep an instrument rating valid does not even approach being adequate for a very large number of pilots that hold instrument ratings. I would like to see something much better required and believe that a competent five-man panel of pilots should formulate any proposed new requirements. In my thinking, the suggested panel should include the following:

1 airline pilot
1 CAA flight inspector
1 approved flight school instructor
1 AOPA flight member
1 aircraft manufacturer (preferably Beech or Navion)

At the moment I am not prepared to make a suggestion of what we should have but I am very much in favor of making the holding of an instrument rating mean something from a proficiency point of view.

I would also like to toss this in for comment, that any aircraft that is operated on an IFR flight must positively be equipped with a full panel instead of the usual primary group (meaning mainly privately owned or small operator charter aircraft). I for one, regardless of the proficiency of the pilot, would not consider riding with him under actual instrument conditions with only a primary group.

Willis G. Wood, Airplane Pilot
Bureau of Aviation
Department of Commerce
State of New York
Albany 7, N. Y.

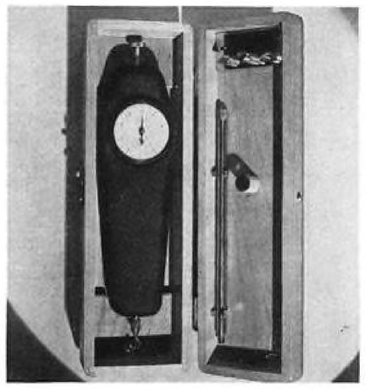
NEW AVIATION PRODUCTS

Totes Bulky Items

For fast, convenient handling of bulky items such as oil drums, barrels, wood boxes, etc., at airports and plants, **Baker Industrial Truck division, Baker-Raulang Co.**, 2168 W. 25th St., Cleveland 13, Ohio, announces clamp truck utilizing hydraulically operated arms to grip load for lifting and transporting. Clamp is of all-welded steel construction with dual double-acting cylinders supplied with pressure oil by truck system. Control valve is in operator's compartment and connecting lines are high-pressure hose clipped to lift chains. Pressure required is under operator's control, permitting handling of loads varying from fragile item to heavy equipment. Clamp arms are steel ribbed. Either standard (straight) arms, or those toeing in 1 in. are available. Rubber insert blocks may be attached to faces for carrying fragile items or to minimize slipping when handling metallic units. Special 3-arm clamp, with center arm straight and fixed, is available for carrying two barrels side-by-side in vertical position.

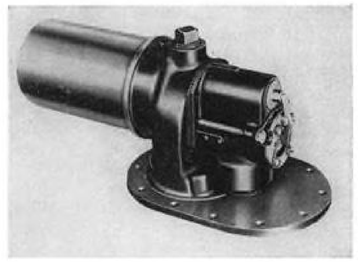
New Control Valve

Small, lightweight, solenoid-operated valves for air or fluids, suitable for operation over wide range of temperatures, have been developed by **Carma Mfg. Co.**, 2401 E. 103rd St., Los Angeles 2, Calif., for aircraft applications. Model 10041 is normally-closed, two-way unit designed for continuous duty at ambient temperatures between −65 and 200 F., at pressures up to 12 psi. Weighing 0.44 lb., dimensions are ¾ in. high, 1 1/16 in. wide, 1 in. thick. It's claimed that device has been subjected to exhaustive life and performance tests covering entire operating range of temperatures, satisfactorily meeting requirements. Other models, both two-way and three-way, handle fluids at pressures up to 50 psi. and can operate intermittently at temperatures as high as 450 F. With slight modifications, these can give continuous operation at this elevated temperature.



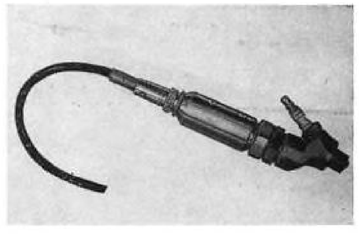
For Force Measurements

New force indicator made by **Hunter Spring Co.**, Lansdale, Pa., utilizes precision compensated spring system to give easy force measurements accurate to ½ graduation or ½ percent at full scale of dial indicator. Force is applied to system through load transmission rod, whose movement deflects compensated spring system, deflection being measured by low friction, fully jewelled indicator. Accurate indications (spring gradient) are claimed possible because relationship between force and spring displacement is linear throughout dial range, gradient of spring system is made with accuracy of ½ percent and friction is virtually eliminated. Instrument is shaped for easy one-hand operation. Attachments include simple thrust button, pulling hook, conical point-force applicator, V-notch thrust fitting for lateral rod pressures, chisel fitting for re-entrant edges and notches, and 6-in. extension rod. Simple cords and tapes, used in conjunction with hook, are handy for tests of tangential forces. Unit has 10-lb. capacity.



Water Injection Pump

New series RD-8500 fully submerged pump for aircraft anti-detonate injection is offered by **Romec Pump Co. division, Lear, Inc.**, Elyria, Ohio. It employs viscosity-controlled fluid bypass to prevent compression of air in fuel system when unit is operated on empty tank, and anti-friction materials permit harmless dry-running. Total submersion of pump and motor unit within confines of water-alcohol tank simplifies installation and requires no external space for mounting. The hazard of galvanic corrosion is eliminated by extensive use of nonconducting insulations between critical points, thus preventing water from acting as electrolyte where dissimilar metals are present. Relief valve is adjustable to 50 psi. outlet pressure, with connection for supercharger compensation optional. Characteristics of typical valve setting are 210 gal./hr. at 34 psi. outlet pressure, with maximum amperes of 13 at 28v. d.c. Fractional horsepower 400c., 208v. alternating motors are included in the series.



Pressuregraph Adapter

Sparkplug adapter, an engine pick-up for pressuregraph testing, is offered by **Electro Products Laboratories**, 549 W. Randolph St., Chicago 6, Ill., to provide increased efficiency in running tests and eliminate need for special handling of blocks. Employing standard brand plug as integral part, device will operate in aviation fuel test engines. When pickup is inserted, diaphragm acted on by pressure impulse modulates electronic circuit. Modulated voltage from pickup is delivered to pressuregraph, amplified, and passed through negative modulation suppressor, then to the oscillograph.

PRODUCTION

Missiles to Reform Production

Airframe firms face real mass production problem, where daily output will have to be in thousands.

U. S. airframe companies are faced with the necessity of radically changing their manufacturing techniques to deal with a new element: mass production of guided missiles.

The situation already is becoming apparent in the growth of the training missile program and tooling for the $50 million worth of production orders coming from Air Force, Army Ordnance, Navy Ordnance, and Bureau of Aeronautics.

What Harry Woodhead, former president of Consolidated Vultee Aircraft Corp., told the President's Air Policy Commission in the fall of 1947 no longer holds true:

". . . We anticipate that the manufacturing processes [for guided missiles] will be fundamentally similar to those of inhabited aircraft."

Flaws in Woodhead's generalization develop from two basic requirements of missile production:

- **Intense manufacturing** mechanization.
- **Complete reversal** of airplane production objectives.

An AVIATION WEEK survey shows that the aircraft industry is aware of these requirements and is using them to pattern missile production planning.

▶ **Thousands vs. Hundreds**—Once past the development stage, the industry will find itself for the first time turning out not hundreds of units but actually thousand of missiles in the "medium" category.

Airframe plants now devoting 80 percent of their space to sheet metal fabrication, largely manual, and 20 percent to machine operations, will be forced to tool up for as much as 80 percent machine operations in missile airframe manufacture. Missile sheet metal fabrication may involve no more than 20 percent or less of production facilities.

▶ **Aims Differ**—Obviously, the guided missile will be designed for a short service life as opposed to the basic requirement of designing and producing an airplane for continuing maintenance.

Dimensional tolerance allowances in airplane manufacture will have to be tightened in missile manufacture. Manufacturing discrepancies which can be corrected after an airplane has been delivered to the customer cannot be allowed in a missile, which makes but one flight and must be "right" before the launching button is pressed.

Conversely, missile production will permit wide latitude in structural fatigue tolerances, because the flight life will be rated in seconds and minutes.

▶ **Materials Differ**—While the principle differences between airplane and missile accessory equipment will be dimensional, the missile frame presents radical innovations in materials and assembly techniques.

The unit quantities of a full-fledged missile production program call for the use of non-strategic materials wherever possible. Cost factors, for example, will void the use of metals such as 75-ST.

But the present consensus of United States manufacturers is that magnesium will be the foundation metal of missile frames of all sizes.

▶ **Rivet Problem**—Most significant comment by a missile production engineer is the simple statement:

"Now we have to find something to take the place of the rivet!"

In large missiles, employing skin and inner frame, the rivet is a costly item, considering that the missile is expendable. The industry's missile divisions will be highly receptive to new, low-cost sheet metal bonding materials.

Airframe manufacturers anticipating large missile orders will have to devise numerous new machines. Numerous new presses and drop hammers will be needed. For small missiles whose frames will be machined from solid castings, forgings, and extrusions, there will be need for complex machines.

▶ **Labor Factor**—Just what this expected mechanization will mean in terms of labor is difficult to predict at this time.

One factory engineer believes that, weight-for-weight, missile production may require no more than 30 percent of the manpower needed for airplane manufacture.

For one thing, a high percentage of airplane production manhours is spent in outfitting the interior of the airframe.

Reduction of manhours required for producing a pound of guided missile should bring about a marked improvement in the manufacturing "learning curve," compared with airplane production. The time from acceptance of a missile contract to attainment of full production should be relatively short, unimpeded by modifications which have proved to be the greatest influence against the learning curve.

▶ **How Much Airframe?**—One aspect of missile manufacture is steeped in controversy. This is the question of just how much of the finished product will be the manufacturing responsibility of the airframe manufacturer.

An averaging of missile designs shows that approximately one-third of the product is airframe, and the remainder propulsion, guidance, and warhead accessories.

Some airframe companies seem, at this time, to be satisfied with the prospect of building only the airframe and delivering it to assembly depots where the "innards" will be installed. Others are plugging for contracts under which they will receive control and propulsion components from accessory manufacturers and then perform complete assembly.

A number of manufacturers appear to feel that missile frames and accessories are so tightly integrated that they should do the whole job, even manufacture electronic and control accessories and power units.

Indication of the thinking of the latter group may be sensed in their creation of electronic engineering sections within their factories, ostensibly, at this time, to "correlate" the association of their airframes to vendor accessories.

▶ **Accessory Side**—Some accesory manufacturers view this as a distinct threat to their participation in missile mass production, and accordingly are campaigning to convince military procurement agencies that they have no interest in the airframe end of the business, but do have accessory production know-how which no airplane company, devoted to aerodynamic structures, can hope to achieve.

While airframe manufacturers avoid discussion of the possibility of a serious battle for contracts to build a complete missile, it is apparent that it might be to their economic interest to do the whole job. Some admit that profits from missile production will be considerably less than those gained from airplane manufacturing, and feel that returns from building the missile frame alone might be marginal.

A significant aspect of missile manufacture is that it need not await the requirement of actual combat to induce peak production.

For some time to come the bulk of military missiles will be in small and medium size categories; units weighing less than 2000 lb. designed to replace ordnance. Relatively few airplane replacement missiles, weighing above 2000 lb. and ranging upward of several times the size and weight of the V-2, will be constructed immediately.

Invitations and Awards to Industry by USAF

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

Abstracts of Bid Awards

For cable (49-436):
Companies sharing — Electric Auto-Lite Co., Port Huron, Mich., on a bid of $35,600; General Electric Supply Corp., Dayton, O., on a bid of $113,029.20, and Essex Wire Corp., Fort Wayne, Ind., on a bid of $124,733.

For phenolic rod sheet (49-733):
Companies sharing—Formica Co., Cincinnati, O., on a bid of $1628.77; St. Regis Sales Corp., New York, on a bid of $28,105.77; Eav-Tex Company, Havertown, Pa., on a bid of $1089.69, and Westinghouse Electric Corp., Dayton, O., on a bid of $1465.97.

For testers (49-820):
Winslow Company, Newark, N. J., on a bid of $13,245.

For hydraulic bender (49-829):
Blackhawk Manufacturing Co., Milwaukee, Wis., on a bid of $6861.50.

For 17 aircraft testers (49-864):
Companies sharing—Winslow Co., Newark, N. J., on a bid of $4400, and Engineering Laboratories, Inc., Tulsa, Okla., on a bid of $10,879.62.

For 95 vapor cleaner (49-860):
Clayton Manufacturing Co., Rosemead, Calif., on a bid of $231,627.98.

For 1220 capacitors (49-940):
Companies sharing—Potter Co., North Chicago, Ill., on a bid of $36; Gudeman Company, Chicago, on a bid of $151.45; Sangamo Electric Co., Dayton, O., on a bid of $80.50; General Electric Co., Dayton, O., on a bid of $151.20; Cornell Dubilier Electric Corp., South Plainfield, N. J., on a bid of $213.34; Tobe Deuschmann Corp., Norwood, Mass., on a bid of $425.21, and Neptune Electronics Co., New York, on a bid of $70.20.

For 204,320 rolls tape (49-949):
Companies sharing—United Mineral & Chemical Corp., New York, on a bid of $1234.10; Firestone Industrial Products Co., on a bid of $38,513.83; Graybar Electric Co., Dayton, O., on a bid of $3610.12; United States Rubber Co., New York, on a bid of $4290.69, and General Electric Supply Corp., Dayton, O., on a bid of $166.86.

For 14 barometers (49-972):
Hass Brothers Instrument Co., Washington, D. C., on a bid of $12,750.

For 10 tester assemblies (49-1055):
Aro Equipment Corp., Bryan, O., on a bid of $6500.

For 10 mailing machines (49-1065)
Honeywell & Co., Inc., Pittsburgh, on a bid of $26,247.50.

For 15 portable welders (49-1066):
Hobart Brothers Co., Troy, O., on a bid of $11,325.

For 49 panel assemblies (49-1094):
Companies sharing—Gadgets, Inc., Dayton, O., on a bid of $2196, and Pacific Airmotive Corp., Burbank, Calif., on a bid of $3491.55.

For 13 honing machines (49-1128):
Sunnen Products Co., St. Louis, Mo., on a bid of $5962.32.

For 1177 aircraft nozzles (49-1130):
A. Y. McDonald Manufacturing Co., Dubuque, Iowa, on a bid of $16,713.40.

For 2513 nozzles (49-1138):
Barnes Manufacturing Co., Mansfield, O., on a bid of $35,131.74.

For 37 portable rectifiers (49-1140):
McColpin-Christie Corp., Los Angeles, on a bid of $26,285.95.

For 213 electric heaters (49-1173):
Industrial Engineering Co., St. Louis, Mo., on a bid of $3578.40.

For field portable tester (49-1183):
Greer Hydraulics, Inc., Brooklyn, on a bid of $9093.72.

For 25 valve grinders (49-1186):
Specialty Auto Fabric Corp., New York, on a bid of $5627.50.

For carbonate sodium (49-1193):
Companies sharing—Phipps Products Co., Boston, on a bid of $16,245, and Octagon Process Inc., Brooklyn, on a bid of $729.30.

For 2280 spare parts (49-1216):
Biederman Motors Corp., Cincinnati, O., on a bid of $18,281.70.

Invitations to Bid

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

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

Procurement field office locations: Boston Army Base, Boston 10, Mass.; Government Aircraft Plant No. 4, Ft. Worth 1, Tex.; 39 S. LaSalle St., Chicago 3; Wright-Patterson AFB, Dayton, Ohio; West Warren and Longo Aves., Detroit 32; 1206 Santee St., Los Angeles 54; 67 Broad St., N. Y. 4.

Current bid proposals:

Mounting Base, 1-3 items, bid invitation No. 49-1723, issue date Apr. 12, delivery 90 days.

Spark Plug, 67,500 each, bid invitation No. 49-1709, issue date Apr. 11, delivery by Jan. 1, 1950.

Radio Parts, 1-8 items, bid invitation No. 49-1712, issue date Apr. 11, delivery 60 days.

Transformer, 4400 each, bid invitation No. 49-1713, issue date Apr. 11, delivery 60 days.

Chamber Assemblies, 60 sets, bid invitation No. 49-1714, issue date Apr. 11, delivery by Apr. 15.

Crystal Units, 1-12 items, bid invitation No. 49-1716, issue date Apr. 12, delivery 60 days.

Capacitor, 1-8 items, bid invitation No. 49-1717, issue date Apr. 12, delivery best possible.

Radio Parts, 1-3 items, bid invitation No. 49-1721, issue date Apr. 12, delivery by July.

Envelopes, 310,200 each, bid invitation No. 49-1724, issue date Apr. 12, delivery 30 days.

Scale, 145 each, bid invitation No. 49-1725, issue date Apr. 12, delivery by August 1.

Drill Press, 80 each, bid invitation No. 49-1727, issue date Apr. 12, delivery by July 1.

Tester, 146 each, bid invitation No. 49-1730, issue date Apr. 12, delivery by July 1.

Blower-Cleaner, 63 each, bid invitation No. 49-1732, issue date Apr. 12, delivery by July 1.

Studio Scale, 161 each, bid invitation No. 49-1733, issue date Apr. 12, delivery by July 1.

Electrical Equipment, 1-19 items, bid invitation No. 49-1734, issue date Apr. 12, delivery 45 days.

Cement, 43,572 quarts, bid invitation No. 49-1735, issue date Apr. 12, delivery 90 days.

Breaker, 450 each, bid invitation No. 49-1736, issue date Apr. 12, delivery 30 days.

Ring Set, 1-46 items, bid invitation No. 49-1738, issue date Apr. 12, delivery by Dec. 30.

Communications Equipment, 1-8 items, bid invitation No. 49-1711, issue date Apr. 11, delivery 60 days.

Toggle Switch, 660 each, bid invitation No. 49-1718, issue date Apr. 12, delivery as soon as possible.

Communications Equipment, 1-4 items, bid invitation No. 49-1720, issue date Apr. 12, delivery 120 days.

Dial Window, 420 each, bid invitation No. 49-1741, issue date Apr. 12, delivery 60 days.

Flexible Moisture Sheet, 46,800 sq. yd., bid invitation No. 49-1742, issue date Apr. 13, delivery 60 days.

Copper Tubing, 1-4 items, bid invitation No. 49-1744, issue date Apr. 13, delivery by Aug. 1.

Silver Solder, 37,000 ounces, bid invitation No. 49-1745, issue date Apr. 13, delivery 5000 ounces monthly.

Cadmium Anodes, 7000 lb., bid invitation No. 49-1747, issue date Apr. 13, delivery 2000 lb. monthly.

Slide Rule, 500 each, bid invitation No. 49-1751, issue date Apr. 13, delivery 30 days.

Stand Assembly, 167 each, bid invitation No. 49-1753, issue date Apr. 13, delivery by July 1.

Motor Generator, 41 each, bid invitation No. 49-1760, issue date Apr. 13, delivery by Nov. 15.

Tester Assembly, 495 each, bid invitation No. 49-1764, issue date Apr. 13, delivery by July 1.

Hood Assembly, 1070 each, bid invitation No. 49-1765, issue date Apr. 13, delivery 60 days.

Acid, 1-3 items, bid invitation No. 49-1767, issue date Apr. 13, delivery 90 days.

Tester Assembly, 1-2 items, bid invitation No. 49-1768, issue date Apr. 13, delivery by July 1.

Chemicals, 1-4 items, bid invitation No. 49-1775, issue date Apr. 13, delivery 60 days.

Parachute Assembly, 2971 each, bid invitation No. 49-1776, issue date Apr. 13, delivery 165 days.

Cotton Cloth, 93,000 yd., bid invitation No. 49-1779, issue date Apr. 13, delivery 60 days.

Steel Welding Electrode, 1-7 items, bid invitation No. 49-1783, issue date Apr. 13, delivery 60 days.

Special Clothing, 1-10 items, bid invitation No. 49-1766, issue date Apr. 13, delivery 60 days.

Connecting Platform, 46 each, bid invitation No. 49-1792, issue date Apr. 13, delivery 90 days.

Cone Assembly, 2216 each, bid invitation No. 49-1793, issue date Apr. 13, delivery 90 days.

Dolly & Cradle Assembly, 22 each, bid invitation No. 49-1794, issue date Apr. 18, delivery 90 days.

Mockup Assembly Trainer, 32 each, bid invitation No. 49-1798, issue date Apr. 18, delivery by Aug. 31.

Gun Charger, 1128 each, bid invitation No. 49-1799, issue date Apr. 18, delivery 400 monthly.

Demonstrator Trainer, 1-6 items, bid invitation No. 49-1796, issue date Apr. 18, delivery by July 1.

Demonstrator Trainer, 1-7 items, bid invitation No. 49-1797, issue date Apr. 18, delivery by Aug. 1.

Demonstrator Trainer, 1-7 items, bid invitation No. 49-1800, issue date Apr. 18, delivery best possible.

Resistor, 2550 each, bid invitation No. 49-1801 issue date Apr. 18, delivery 60 days.

Demonstrator Trainer, 1-10 items, bid invitation No. 49-1802, issue date Apr. 18, delivery by Aug. 31.

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

A Lift and a Light for Berlin

"Aircraft's greatest achievement." That statement has been applied many times to the Berlin Airlift. And rightly so. The Airlift has changed all military logistic concepts . . . lessons learned from the operation will affect the future of all aviation.

Among equipment selected for this vital task, the Westinghouse name appears with significant frequency . . . particularly in those applications where dependable performance counts most. Typical examples are shown on these pages. A new cargo hoist—more powerful and with many times the life of former units. Flashing beacon lights—that flash with a brilliance 9 times greater than the sun's. Transformers—that can take a direct stroke of lightning without failure.

These illustrate why, on the tough assignments—that call for unfailing performance—you'll find Westinghouse equipment being selected. And it is also why Westinghouse is your best source of supply for all your aircraft needs—from tiny aircraft lamps to powerful turbo-jet engines . . . from radio and radar to giant wind tunnels.

Check the complete line of Westinghouse Aircraft products. Call your local Westinghouse Office, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-94797

Hoist speeds loading and unloading

Westinghouse engineering was put to test when asked to design a cargo hoist unit that would be dependable under all conditions . . . be completely explosion-proof. The answer is illustrated here. This unit can lift 4,300 lbs. of cargo at 24 feet per minute . . . weighs only ninety-two pounds. The assembly consists of a twenty-four volt motor, a triple planetary gear, a speed limiter and a magnetic brake. Because of its long life, no spare need be carried by the plane, saving weight.

Lights penetrate heaviest fog

A major problem of the Airlift has been its flight-grounding fog. To combat this condition, Westinghouse Flashing Beacon Lights are being installed at seven Airlift fields for identification purposes. These lights make visual landings possible under worst weather conditions. Flashing 40 times a minute, the light can penetrate the heaviest fog for a distance of at least 1,000 feet. However, the peak flash does not blind the pilot because its apparent duration is so short. On clear or hazy days, or clear to light foggy nights, the intensity can be reduced.

Sure transformer operation

The "CSP" (Completely-Self-Protecting) transformer—long accepted as the best transformer under all conditions—protects itself against lightning, short circuits and overloads. At the Airlift, 414 "CSP" transformers are being used for approach and other airfield lighting.

Westinghouse

LEADER IN AVIATION EQUIPMENT

Endurance Record Falls—Hard!

Pair in modified Aeronca aim at 1000-hour goal after leaving previous 726-hour lightplane mark well behind.

With a new world's endurance flight record already established Bill Harris and Dick Reidel early last week continued their monotonous grind aloft in an Aeronca Sedan, christened "Sunkist Lady" in an effort to reach a new mark of 1000 hr., at Fullerton, Calif.

At 5:44 p.m. (PST) Apr. 14 they had passed the 726-hr. record previously set by Wes Carroll and Clyde Schlieper of Long Beach, in 1939.

► **Fourth Attempt**—The Aeronca is the same 1948 Sedan in which they previously attempted three other endurance flights. Last December they were forced down on their third attempt after 58 hr. by icing conditions.

A new C-145 Continental engine was installed for the successful attempt. Engine installation was modified by Don Young, Macmillan Petroleum Corp. engineer, to permit oil changes in flight.

► **Oil Changes**—Modifications included: A drain line from the crank case to the tail of the airplane, fitted with a shut-off valve; a visible gauge mounted on face of the firewall inside cockpit to show oil level in crankcase; a reserve oil tank to supply fresh oil replacing that drained was mounted on the cabin floor; a hand-operated air pump forced fresh oil through a line from reserve tank to crankcase, after gauge showed old oil had been nearly drained; regulation filter screen was replaced by a fitting which by-passed the oil through a line to a four-way valve attached to filter screen in cockpit; by setting valve in one position, oil would flow through valve, screen and back to crankcase. In another valve position oil flow would by-pass screen and return to crankcase. This was used only at intervals when it was necessary to remove the screen, inspect, clean and reinstall it.

The six-cylinder opposed air-cooled engine develops 145 hp. at 2700 rpm., but turns over at 2300 rpm., at the cruising speed of 100 mph. which was selected. Fuel consumption was reported less than 7 gal. hr. and oil consumption approximately ½ pint hr.

► **Pickup Gas**—The airplane was being refueled by picking up three-gallon cans from a Jeep travelling at 65 mph. for the operation. A three-man Jeep crew included the driver, a man who took the empty cans, and another who handled the full fuel cans.

Plane is equipped with 81 gallons capacity fuel tanks sufficient for 12 hr. flight without refuelling. Normal fuel tanks for the Sedan holds 36 gal. Right side of cabin is fitted with a sleeping pad so that one pilot may sleep while the other flies.

► **$10,000 Supplied**—Barris, 36, and Reidel, 35, both workers at Fullerton Air Service, were financed in the flight by the Fullerton Chamber of Commerce which had put approximately $10,000 into the flight at the time the record was broken.

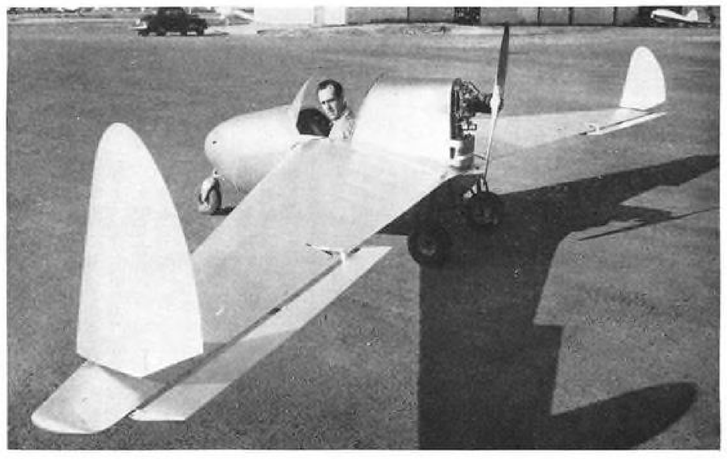
Food prepared by dieticians was passed aloft to the flyers from the Jeep, and included principally a liquid diet of milk, orange juice and tomato juice, but no water.

► **New Wrinkle**—A new variation in endurance flights was the cross-country non-stop flight to Miami, Fla. and return, following good weather forecasts to avoid repetition of the icing incident which ended their last December flight.

Approximately 3000 persons came out to the airport at the time the old record was exceeded, and the crowd interfered with the refuelling to a point where the Jeep moved over to a nearby USAF field to complete the operation. At night, the flyers have been taking the plane over in the desert near Palm Springs, to Thermo, a place which has consistently clear night weather, to avoid any bad night weather at the home field.

► **Broken Window**—On one occasion in a night pickup the flyers broke a window, and continued through the night with a piece of cardboard stuffed in the opening. A replacement window was passed up next day and installed.

Refuelling endurance flights extend at least as far back as 1923 when U. S. Air Service pilots Smith and Richter accomplished the first plane-to-plane refuelling at Rockwell Field, San Diego. Better known is the "Question Mark" Fokker transport endurance record of 150 hr. 4 min. set in 1929 by Maj. Carl Spaatz and Capt. Ira C. Eaker, both later USAF generals.



Wee Wing Preparing for Tests

A swept-back midget flying wing-type craft, the Wee Wing, is expected to be test flown in the near future. Designed and built by Robert M. Sebring at San Fernando, Calif., craft is constructed of plastic bonded plywood and is purely experimental.

With an 8-hp. Righter Target engine, the plane has taxied and left ground briefly, with good showing of control. Sebring informs Aviation Week he will replace engine with a 25 hp. Nelson engine, and rebuild center section wing roots to increase span from 29 ft. to 31 ft. Pilot occupies a pod nacelle similar to that of Bowlus Baby Albatross sailplane cockpit.

Wing chords are 42 in. at center and 9 in. at tips. Wing at juncture with nacelle has 9 in. thickness. Present tricycle gear will be replaced for test flights with tandem gear. Controls are adjusted for sensitivity.

Conventional rudder pedals operate windtip drag rudders and wheel operates elevators which also serve as ailerons.

BRIEFING FOR DEALERS & DISTRIBUTORS

PROPELLER GOVERNOR—Flight tests have been completed on a new type propeller governor developed by Robert Haskins, president of Flight Research Engineering Corp., Richmond, Va., and designed as an accessory for standard Beechcraft controllable propeller models B-200 and R-200. Unit will be priced at less than $300, weighs 3½ lb., including controls, and installs in a shock mounting behind the instrument panel. The governor is reported selling at lower cost than anything previously offered for the same purpose.

By attaching it to this controllable Beech prop the combination acts as a constant speed propeller, with constant engine rpm. regardless of turbulence, power setting or attitude of aircraft, within 25 rpm. plus or minus. By using the governor the engine instantly attains full takeoff rpm. when the throttle is opened, since the propeller blades immediately go to correct pitch.

Fuel economy and decreased pilot fatigue are also cited as other advantages. Manual auxiliary control is provided in event of possible failure of the mechanism.

In a series of service tests at Byrd Municipal Airport, Haskins reports that "all possible combinations" of artificially induced failures were tried. In all such tests the propeller either reverted to full allowable flat pitch, or froze in its operating pitch, but showed no tendency to run away. CAA approval on the governor is expected in time to make first deliveries late in May.

AVIATION WEEK, MICHIGAN STYLE—Skillful guidance of Bendix Aviation's Bill Mara can be detected in the elaborate and detailed planning which is going on for the Sixth Annual Michigan Aviation Week, June 3 to 12.

Mara, who is being transferred from his Detroit post as advertising director for the corporation to Baltimore to head up Bendix home radio and television division, is general chairman of the Michigan Aviation Week. He has set up a committee of 500 Michigan citizens, with Gov. G. Mennen Williams as honorary chairman, and expects to have some 350,000 person participate in events of the week.

Michigan industry has subscribed a $30,000 budget for promotion of the affair. More than 60 Michigan airports are expected to hold open house June 11 and 12. Other events include a pilots regatta June 5 at Lansing, with $3000 worth of prizes; model plane championships, flying farmers field day, aircraft design contest among students of Michigan universities, technical forums, a Miss Michigan aviation contest, air passenger and air cargo demonstrations and aviation editorial, photo and art contests among high school students.

It is probably the biggest state-wide aviation promotion in this country, and all phases of aviation should reap benefits from it. But probably the biggest benefit is in getting the various aviation interests in the state to work together, even for a week. There are other states whose aviation people could take a lesson from Michigan and Mara.

BACK TO FARM—Voters in Sheboygan, Wis., recently decided by a decisive vote of 7386 to 3368 not to build an airport, thus settling some 10 years of argument in city council. Land had already been purchased for an airport, but was being rented for farm use pending the voters' verdict.

55 MINUTES—Bill Wagner, Ryan public relations director, has a million of 'em—stories about the Navion, which he will tell to anybody who will listen.

Latest is about a pleased customer, name of "Red" Fodrea, an accountant for the Martin Construction Co. in Stibnite, Idaho. It seems Mr. Fodrea has occasion to go frequently from Stibnite to Boise, an apparently small matter of intra-state driving.

Up in Idaho, where winters are winters, it takes him 32 hours on the road. But then, why is Mr. Fodrea pleased? He has discovered that he can make the trip in 55 minutes, in a certain all-metal four-place tricycle gear airplane manufactured on the West Coast, a net saving of 31 hr. 5 min. regardless of road conditions.

—ALEXANDER McSURELY

AIR TRANSPORT

Skycoach Builds Traffic and Strife

As load factors soar, Capital and NWA fight over competition and UAL wants TWA aircoach ended.

The traffic-generating magic of low-cost skycoach experiments by certificated domestic airlines is becoming increasingly apparent.

Capital Airlines and Northwest Airlines have reported spectacular load factors on four new aircoach runs started this spring. And officials of both carriers are now regarding the non-luxury service as a permanent part of air transportation.

Braniff Airways and National Airlines are preparing to board the skycoach bandwagon shortly. Braniff has requested authority to start 4-cents-a-mile "thrift flight service" between Dallas-Ft. Worth and Chicago on May 15 using DC-4s. NAL wants to inaugurate tourist fare "Nightbird" DC-4 operation between New York and Miami by mid-May.

▶ **Carmichael Comments**—In his annual report to stockholders, Capital President J. H. Carmichael said the company has shown a continuous net profit on aircoach services since they began Nov. 4. This profit, he made clear, was produced after the operation absorbed its prorated share of overhead expenses—all of which existed whether the aircoach was conducted or not—and after paying all special promotional costs.

"Capital will continue to explore the possibilities of offering two basic passenger tariffs, one for standard service (at close to 6-cents-a-mile), and the other for aircoach (at 4-cents-a-mile)," Carmichael continued. "The latter will be expanded wherever the travel market indicates that an aircoach operation is sound. Events of the past four months clearly indicate that aircoach is the forerunner of a new phase of air transport development."

▶ **Northwest Endorses Coaches**—Croil Hunter, president and general manager of Northwest, voiced similar convictions in his annual report. "Diversified air service to meet the needs of mass use of air transportation will be developed by NWA as the main objective for the coming year," he declared. "Recently, it has become convincingly clear that lower rates are not only economically feasible but must be offered if the airlines are to develop mass transportation."

The NWA president said his company contemplates offering three classes of passenger service: 1. Deluxe nonstop or limited-stop service with Boeing Stratocruisers; 2. A standard service such as that now offered with DC-4 and Martin 2-0-2 equipment; and, 3. A tourist or coach operation without the refinements of the standard service.

▶ **High Loads Reported**—Northwest reported that passenger load factors during the first 10 days of its transcontinental DC-4 coach flights between New York and Seattle were about 78 percent eastbound and over 51 percent westbound. Service was inaugurated Mar. 25.

Whenever the flights lack capacity 55-passenger loads they are "topped off" with cargo. Since most of NWA's cargo moves from east to west, while the heaviest coach passenger business has been from west to east, the two kinds of service are complementary.

Capital, which inaugurated a New York-Minneapolis aircoach operation on Mar. 25, achieved a 61 percent load factor during the first 10 days of April. On the Washington-Chicago "Nighthawk" coach run, started Apr. 1, Capital's passenger load factor was 70 percent during the first 10 days of service.

▶ **Capital Packs Them In**—On the Washington-Pittsburgh aircoach shuttle started Apr. 1 and connecting with the New York-Minneapolis coach flight, Capital's passenger load factor was 62 percent during the first 10 days of operation. Capital's original "Nighthawk" service from New York to Chicago showed a 76 percent passenger load factor from Nov. 4 through Apr. 10. But for the first 10 days of April alone, load factor on this run was a fat 82 percent (86 percent eastbound and 78 percent westbound).

By contrast, Capital's overall passenger load factor during the first 10 days of April (heavily weighted by the more numerous regular-fare flights) was only 51 percent. Company estimates breakeven passenger load factor on its 60-passenger DC-4 aircoaches is 50 percent.

▶ **Clash Over Competition**—Already Capital and NWA are at odds over division of the tourist-class market. Capital has asked the Civil Aeronautics Board to suspend Northwest's proposed competitive 4 cents a mile skycoach tariff between Washington, Pittsburgh, Cleveland, Detroit, Milwaukee and the Twin Cities.

The new NWA coach operation was slated to begin late last week. Capital said the service, to be conducted with 36-passenger Martin 2-0-2s, would be fundamentally different from the low-fare DC-4 flights now offered by both NWA and Capital.

"Even with a 100 percent load factor, Northwest could not break even at 4 cents a mile fares with 36-passenger Martin 2-0-2s," Capital told CAB. President Carmichael also declared that neither Capital nor NWA could operate competitive skycoach services between Washington and the Twin Cities at a profit. He pointed out that successful skycoach operations depend on comparatively heavy loads.

▶ **UAL Battles TWA**—Meanwhile, United Air Lines has complained to CAB against extension of TWA's Kansas City-Los Angeles DC-3 skycoach operations (started Feb. 7) to the New York-Kansas City and Los Angeles-San Francisco links on May 1. TWA had indicated it would not operate through coast-to-coast tourist-class service since a daytime layover would be required at Kansas City. But United believes TWA is aiming at a through New York-Los Angeles coach service for $105.30, compared with the regular $157.85 rate.

Besides opposing TWA's new coach operations, United wants CAB to suspend TWA's present low-fare Kansas City-Los Angeles service. At the recent annual stockholders' meeting, UAL President W. A. Patterson declared his company "continues to feel that aircoach service cannot be justified under present costs."

A few days earlier, TWA President Ralph Damon said passenger acceptance of his company's DC-3 aircoach operation between Kansas City and Los Angeles was about twice that experienced previously on the run with the same type equipment at conventional fares. He added, however, that it must still be determined whether the coach traffic is new business or business taken from regular flights.

AA WORKHORSES AWAIT NEW OWNERS

Replaced in passenger service by DC-6s and Canvair-Liners, retired American Airlines DC-3s and DC-4s are shown parked at the carrier's Tulsa, Okla., overhaul base. Some are being modified for purchasers, and others are still awaiting buyers. On Mar. 31, when AA retired its last DC-3 from passenger service, it acquired the last of its 75 Convair-Liners on order. American's DS-4s were retired from passenger service in December, with some of them going into company's cargo operations. Carrier's completely new postwar passenger plane fleet cost $60 million—about $22 million for the 75 Convair-Liners and $38 million for 50 DC-6s.

New Building

A $35,000 temporary administration building to provide passenger facilities is to be built at Vancouver International Airport. It will replace facilities destroyed by fire earlier this year.

The temporary facilities will be provided through erection of the shell of the future airport restaurant on the site of the burned-out administration building and will be one-story, 150x50 ft. Airlines will finance inside partitioning. Plans have been approved by Vancouver City and forwarded to the Department of Transport at Ottawa.

Earnings Reflect Traffic Gains

Carrier statements show operating deficits are down and revenue passenger mileage is above last year's levels.

Gaining momentum month by month, airline traffic during the first quarter of 1949 pushed far above last year's levels. And earnings statements show it.

Revenue passenger mileage flown by the 16 domestic trunklines during February soared more than 20 percent above totals for the same 1948 month. In January, the increase had been a modest 6 percent.

▶ **More Gains in March**—Preliminary figures for March show more gains. American Airlines during the month flew 121,900,000 revenue passenger miles—up 37 percent over the 89 million reported for March, 1948. United Air Lines flew 95,478,000 revenue passenger miles domestically and to Hawaii in March, up 34 percent over the same month last year.

Traffic levels of both American and United were depressed during first quarter 1948 because of the DC-6 grounding. Even so, gains this year have in many cases exceeded expectations. Freight and mail volume is running far ahead of 1948, although express is down slightly.

NWA AWARD

The President's Certificate of Merit—highest award that can be given to a civilian organization—was formerly awarded to Northwest Airlines recently in recognition of its wartime activities. Certificate was presented to Croil Hunter, president and general manager of NWA, by Lt. General Curtis LeMay, commanding general of the Strategic Air Command, for the airline's and its employes' outstanding contribution to the war in maintaining a bomber modification center at its main overhaul base in St. Paul, Minn., and in operating a transportation "lifeline" to Alaska and the Aleutian Islands during the critical days of the war. General LeMay was met by Mr. Hunter as he stepped from his personal plane at Northwest's base at Holman Field in St. Paul.

▶ **Losses Pared**—In January, operating deficits of the 16 domestic trunklines aggregated about $3,450,000—vs. the $4,811,000 loss reported for January, 1948 (AVIATION WEEK, Apr. 11). In February of last year, loss was a mountainous $5,750,000 (before recent retroactive mail payments). The carriers' operating deficit this past February is not expected to exceed $3,500,000.

American Airlines, which lost about $1,240,000 in March, 1948, estimates it was close to the breakeven point in the same month this year. Instead of the $4,880,000 deficit shown at the end of the first quarter of 1948, AA's loss in the same period this year should be under $1 million.

▶ **UAL Reports**—United isn't doing as well financially. It lost $2,823,000 on domestic operations in the first two months of 1949, compared with $2,482,000 in the same period last year. But UAL's systemwide net loss for first quarter 1949 will be less than for 1948, according to United's President W. A. Patterson.

TWA also lost considerably more on domestic services in January-February, 1949, than the $750,000 dropped in the same two months of 1948. Yet here again the systemwide net loss for the first quarter is expected to be under 1948 levels.

▶ **Overseas Traffic**—Aided by special excursion fares, passenger travel on TWA's International routes during first two months of 1949 was 30 per cent above 1948. Losses were down sharply. The same general situation held true for American Overseas Airlines and Pan American Airways' Atlantic division.

Two small domestic carriers—Delta and National—are well in the black so far in 1949, but had heavy losses early in 1948. Delta earned $130,000 in January-February, 1949, while it lost $417,000 in the first two months of the previous year. National made about $450,000 domestically in January-February, 1949, against a $448,000 operating loss in the same period in 1948.

▶ **Profits for Eastern**—Eastern Air Lines' profits during first quarter 1949 are expected to be ahead of the lush first three months of 1948, when the company netted well over $1 million. After a fairly slow January, EAL's passenger

traffic picked up sharply in February and March.

Western Air Lines reports that preliminary figures for March show a chance of breaking even for that month for the first time in five years. WAL's first quarter operating losses will be far under the $603,000 figure reported for the same period last year.

Capital Airlines' operating losses during the first two months of 1949 were slightly under the $822,000 deficit which was reported for the same period during 1948.

March showed further improvement, and a profit is expected in April. Revenue passenger mileage reported by Capital in the first two months of this year was up more than 23 percent over January-February, 1948.

▶ **Deficit Wiped Out**—In its recently-issued annual report for 1948, Capital disclosed an $835,118 operating profit and a $123,997 net profit. Prior to large retroactive mail payments, the carrier had shown a heavy loss as the report for this year.

These mail payments also trimmed capital's loss for 1947. Originally, the net deficit was set at $2,652,000. But retroactive mail payments reduced this to $1,581,000.

President J. H. Carmichael noted that 18 months ago Capital's existence hung in the balance. "Today," he said, "it is a vigorous, going concern."

Carmichael estimated that Capital's passenger traffic for 1949 would approximate that of 1948 but that some signs point to growth. He declared the company could handle substantially more traffic without expanding present facilities.

▶ **Capital Eyes New Equipment**—Any re-equipment program involving replacement of Capital's DC-4s and DC-3s is contingent on the successful conclusion of a refinancing plan, the annual report stated. Several new types of equipment are being studied by the company.

Realizing that its present DC-3s must be kept in service for some time to come, Capital is modifying them to carry 24 instead of 21 passengers and is installing built-in steps, carry-on baggage facilities and rear cargo compartments. This work, costing only about $8000 per plane, is being done in the carrier's own shops. Modification of the entire DC-3 fleet is to be completed by mid-summer.

▶ **Improvement for NWA**—Northwest Airlines, while still deeply in the red, is also showing some improvement. During January and February, the company's domestic traffic was down slightly from last year's levels, but operating losses were reduced.

NWA's recently-issued annual report for 1948 showed net loss of $787,474, compared with a deficit of $1,141,340 in 1948. The domestic deficit of $2,065,815 was partly offset by a profit of $1,278,342 on overseas operations. Significantly, Northwest last year had a higher passenger load factor on its Orient route (58.25 percent) than on the carrier's own domestic links (56.31 percent).

Where Air Mail Money Went

Big Five Carriers	Revenue	Ton-Miles
United	$5,480,139	9,195,268
TWA	5,327,012	8,871,096
American	4,508,959	8,093,657
Eastern	2,951,911	4,376,272
Northwest	2,062,488	2,197,432

Mileage-Rate Carriers	Revenue	Ton-Miles
Capital	$5,372,237	884,110
Delta	3,240,022	927,025
Braniff	2,650,792	948,192
Northeast	2,115,389	74,997
Southwest	1,917,825	45,892
Chi. & South.	1,892,475	481,731
Pioneer	1,541,750	73,809
Western	1,530,883	467,042
Colonial	1,362,784	81,616

Mileage-Rate Carriers (cont'd.)	Revenue	Ton-Miles
Continental	$1,352,437	180,184
Trans-Texas	1,230,877	37,942
National	1,035,506	326,189
Monarch	995,899	26,444
All American	967,791	41,355
Mid-Continent	962,023	298,096
West Coast	887,170	11,263
Piedmont	884,979	18,785
Empire	825,658	21,038
Challenger	818,714	33,903
Florida	792,197	7,817
Inland	640,258	107,015
Wis. Central	430,346	11,521
Los Ang. Air.	371,526	28,400
Caribbean-Atl.	162,461	6,605
Robinson	96,998	3,815
Hawaiian	28,011	46,885

The "Big Five" domestic airlines handled over six times as much mail business for the government in 1948 as the 26 other certificated domestic carriers and did the job for about $15 million dollars less than what it cost with the smaller operators.

A CAB study submitted to Sen. Burnet Maybank (D., S. C.) shows that the government's domestic mail business for calendar 1948 totaled 37,925,396 ton miles; payments to carriers totaled $54,437,534. The Big Five flew 32,733,725 ton miles for payments totaling $20,330,512. The 26 mileage-rate carriers, including feeders, handled only 5,191,671 ton miles for payments totaling $34,107,022.

The survey shows that one feederline, Florida Airways, received over $100 for each ton mile of mail flown. By contrast, the Big Five were paid an average of 62 cents per mail ton mile flown.

Seattle Improvements

Both major airports at Seattle, Wash., are "dangerous" and a hazard to safe flying, the Air Line Pilots' Assn. has charged after a study it made following a DC-3 crash at Boeing Field Jan. 2 which claimed 14 lives.

Boeing Field is used by United, Pan American, Trans Canada, West Coast, most of the nonskeds and many private flyers while the newer Seattle-Tacoma field is used so far only by Northwest and Western Airlines. Both are ringed with dangerous obstructions, have inadequate lights and landing systems and lack fire-fighting equipment necessary to save lives in the event of plane crashes, the report said.

"Presence of small planes on the field" is an "ever present" danger at Boeing Field, the pilots found. "The runway lights are of too low intensity and difficulty is experienced in spotting and identifying the runway under conditions of restricted visibility," said the report.

The Seattle-Tacoma Airport, where the Port of Seattle now is completing a $3.5 million administration building, "already is obsolete," the report continued. "We believed the runways all are of insufficient length and width for the equipment being used. Runway lighting is inadequate, particularly on the ILS runway. Neither runways or taxiways are properly marked."

Following criticism of the field by the pilots, Seattle Port Commission has announced the main runway at Seattle-Tacoma Airport will be lengthened at least 1000 ft. CAA has been asked to provide matching funds.

Improvement program also calls for installation of high-intensity lighting, lack of which also was criticized by the pilots. Fire-fighting equipment will be stationed on the field next summer, when United and Pan American join Northwest and Western at the field. Present fire protection comes from King County fire district stations on three sides of the field.

Pilots had recommended that "the matter of crash and fire protection be taken out of the category of future planning and receive immediate attention."

Alaska Airlines Shows Profit For 1948

Showing substantial earnings on its worldwide nonscheduled and contract services, Alaska Airlines was well in the black for fiscal 1948—the carrier's first full year under President James A. Wooten.

In spite of higher costs, reduced fares, and losses on its certificated routes—within Alaska, the Anchorage-based company's profit for the year ended last Oct. 31 was $152,438, compared to an adjusted net loss of $611,230 for fiscal year 1947. Gross operating revenue was up 67 percent. Profits continued through the first quarter of fiscal 1949.

▶ **Overseas Flights**—Alaska Airlines has a contract with the Navy for airlift from Fairbanks to Point Barrow on the Arctic Ocean. In other major movements off its regular routes, AA last year flew four complete round-the-world trips; six trips carrying military dependents from Seattle to Tokyo; 11 trips carrying war brides from Germany to New York; 87 trips for the armed forces from the eastern seaboard to Europe in support of the Berlin airlift; a six-weeks operation from Mexico City to Lisbon and Madrid for a Mexican flag line; and a two-months operation between London and Johannesburg for a South African line.

AA also conducted a scheduled operation between the U. S. and Alaska under special CAB exemption during the West Coast shipping strike from September to December. Recently the carrier has been transporting 5000 displaced persons from Aden, Arabia, and Shanghai to Haifa, Palestine. A few months ago company began a weekly roundtrip between San Francisco and Tokyo for the military.

Eighteen aircraft were added to Alaska Airlines' fleet in the past year: six C-46Fs leased from the Air Force, five new Bell helicopters, and seven single-engine planes for bush operations, including Grumman Widgeons and Noorduyn Norsemans. Company currently has pending before CAB applications for routes from Fairbanks, Alaska, to Great Falls, Mont., the Twin Cities and Chicago; and from Anchorage and Kodiak to Seattle, Portland, San Francisco and Los Angeles.

KLM Service

KLM is now conducting its thrice-weekly Amsterdam-Batavia Constellation flights via Khartoum and the British island of Mauritius. Need arose when the Indian and Pakistan governments refused to lift the ban on KLM aircraft because of Dutch police action.

Survey Merger

(McGraw-Hill World News)

MONTREAL—Canadian Pacific Airlines has disposed of its aerial survey business to the Photographic Survey Corp., Canadian associate of the British-controlled Hunting Aviation Group, and will withdraw from the survey field.

A subsidiary of PSC, Photographic Surveys (Quebec) Ltd., will carry on the existing CPA contracts as well as its own parent company's business in Quebec. The new subsidiary, in addition to acquiring CPA's survey aircraft and laboratory equipment, will retain CPA's Montreal offices and certain of its key personnel. J. P. Lafromboise, present superintendent of CPA's survey division, is among those joining the staff of the new subsidiary. P. F. Osler, present manager of PSC's Montreal office, will become manager of the new subsidiary.

PSC has moved into its newly-completed ultra-modern Toronto plant at 1450 O'Connor Drive.

New Job for 314s

The veteran 42-ton Boeing 314 flying boats originally operated by Pan American Airways and BOAC have taken on a new job.

Three of the 89-passenger craft, operated by Americans, are to start flying immigrants from Europe to Australia in May. Fifteen ex-GIs have registered Immigration Air Transport Pty. Ltd. in Sydney to bring 200 immigrants monthly into that city from Naples, Italy. Company head is Fred M. Folsom.

World Airways, Inc., New York, announced plans to sell its fleet of seven Boeing 314s early this year (AVIATION WEEK, Feb. 14). The irregular carrier used the flying boats on the New York-Baltimore-Puerto Rico run in 1948.

Competition in Calif.

Uncertificated intrastate airlines are making the heavily-traveled Los Angeles to San Francisco route the ultimate in bargain-rate transportation, to the deep concern of carriers holding CAB franchises to fly the link. Even the bus companies are worried.

California Central Airlines, which began operating the run with 28-passenger DC-3s early in January, apparently is going great guns and reports a profit on its $9.99 fare. Last month, Robin Airlines entered the competition, offering Los Angeles to Oakland DC-4 accommodation for $9.95.

► **Investigation Underway**—United Air Lines charges $21.05 for the 340-mile trip and Western Air Lines charges a flat $20. The California Public Utilities Commission recently held hearings to determine whether California Central's fare is "just and reasonable", and a probe of Robin's operations is also planned. CAB, which is cracking down on nonscheduled carriers, presumably cannot touch the scheduled intrastate services of Robin and California Central unless interstate traffic is handled.

Reporting a 50 percent load factor in January and 76 percent in February, California Central says it made a profit during its first two months of operation. Load factor during the first half of March rose to 78 percent.

► **Equipment Leased**—California Central leases its equipment from Airline Transport Carriers, Burbank, a $99 transcontinental nonscheduled operator. Officers of California Central, which has less than a dozen full-time employes, are the same as those for ATC. California Central carried over 2000 passengers in January, 3340 in February and over 2100 in the first half of March.

Robin Airlines, based at Burbank, also has flown transcontinentally and early this year took over the DC-4 lease commitments Air America had with California Eastern Airways and the Flying Tiger Line. Air America suspended its 4 cents a mile coast-to-coast flights last Dec. 31 but plans to resume service this month.

Airlines and Courts

U.S. juries are imposing high penalties on airlines whose passengers sustain injuries, either physical or mental.

In Tampa, Fla., a Federal jury recently ordered National Airlines to pay $5000 to a man it allegedly removed from a plane in favor of a regular customer. The complainant said a deputy sheriff was sent to force him from the transport after he refused to cancel his reservation only a few minutes before plane departure time.

► **Breach of Contract**—NAL said the seat was one on which another person had a standing reservation but that in this case it was not claimed until after the space had been given to the complainant, who was offered, but turned down, a seat on a later flight. The displaced passenger asked $25,000 for humiliation, mental suffering and additional expenses because of delays; and the judge instructed the jury to find that National had committed a breach of contract.

In Minneapolis, a man won a $25,000 verdict against Mid-Continent Airlines for injuries suffered while he was a passenger on a plane that encountered turbulence. The complainant said the seat belt warning light on the MCA DC-3 bound from Minneapolis to Omaha should have been turned on by the pilot before the turbulence was encountered.

The plane ran into a squall. Passengers who did not have their seat belts fastened were thrown to the ceiling when the craft dropped suddenly. The complainant allegedly suffered a neck dislocation. MCA reportedly contended that the passenger assumes the risk for injuries sustained under such circumstances.

Piedmont Ruling

Ruling that CAB has no power to award routes to a carrier that did not apply for them, the U.S. Court of Appeals for the District of Columbia has reversed a Board order granting a three-year feeder certificate to Piedmont Aviation, Inc., Winston-Salem, N. C.

CAB, in its southeastern states area decision of Apr. 4, 1947, awarded Piedmont short-haul links in Ohio, Kentucky, West Virginia, Virginia and North Carolina. State Airlines, Charlotte, N. C., an unsuccessful applicant, protested the Board's decision, charging that Piedmont had not sought the routes received and that CAB consequently exceeded its authority.

The court said that of 39 points Piedmont asked to serve, only nine were on the routes awarded to Piedmont by CAB. The routes finally granted Piedmont could not even be considered a modification of that carrier's proposed system except by "distortion of reality and totally unreasonable, capricious and arbitrary interpretation of the word 'modification'," the court declared.

A map prepared by the court showed that the routes awarded Piedmont closely paralleled the system applied for by State Airlines. In reversing the case, the court remanded it to CAB for further proceedings. Piedmont has been operating its controversial routes since February, 1948.

Ask Route Extensions

Braniff Airways is bidding for major extensions of its domestic and international services. The carrier, which is now authorized to fly from Houston to Rio de Janeiro and Buenos Aires via Havana and Lima, Peru, has asked CAB for route extensions from Havana to Washington and New York, and from Lima southward to Santiago, Chile.

The Braniff move came less than a month after Peruvian International Airways went into bankruptcy and suspended operations. PIA's routes extended from Santiago to Washington and New York via Lima, Havana and other points.

Rickenbacker Hits Federal Subsidies

Eastern Air Lines President E. V. Rickenbacker, whose company has been the air transport industry's only consistent money-maker during the postwar period, has again lashed out at government subsidization of his competitors.

In a special letter to EAL stockholders, Rickenbacker asserted that subsidized competition is wholly unjustified and unfair to the unsubsidized operator. "Subsidy," he said, "violates the principles of private enterprise because in effect it puts the government in competition with the individual. And it is unfair to the taxpayers who must foot the bill to cover the waste."

▶ **Economy Emphasized**—Rickenbacker declared that Eastern makes money without subsidy because it conducts its business at the highest level of efficiency and economy. He said that if the 15 other domestic trunklines had been run at EAL's cost level in 1947 they would have shown an aggregate operating profit of $17,537,000 instead of the $23,759,000 loss actually sustained.

The EAL executive charged that the airlines which have done the best jobs have received the least from CAB in grants of new routes and mail pay. He said that had Eastern shown a large deficit, much of the competition which CAB has imposed on EAL would not have been authorized and Eastern itself would have been the recipient of subsidy.

▶ **Costs Compared**—With costs of 48.19 cents a revenue ton mile, EAL had a $2,859,000 operating profit in 1947. United and American had the next lowest operating expenses, 51.04 cents and 51.05 cents a ton mile, respectively, followed by Delta, 53.87 cents; TWA, 55.32 cents and Northwest, 56.13 cents.

Rickenbacker said that at EAL's 48.19 cents a ton mile cost level, American in 1947 would have shown a $455,000 profit instead of a $4,159,000 loss; United a $1,214,000 loss instead of a $5,203,000 loss; and TWA a $2,215,00 profit instead of the $4,747,000 loss actually sustained.

Boost for Low Rates

Scandinavian Airlines System is convinced that the 25 percent fare reduction on roundtrip excursions offered by trans-Atlantic carriers during the past winter was a huge success. It wants more of the same next year.

Between Oct. 1, 1948, and Mar. 31, 1949, SAS carried 6624 passengers on its North Atlantic route, 37 percent more than in the same period a year before, with no excursion tariff in effect. Of the 6624 passengers handled in the six-month period, 38 percent, or 2505, flew under the excursion rate. Of 2379 SAS passengers flying eastbound to Europe, 55 percent took advantage of the special fare.

SAS General Traffic Manager Harold Gyllensward asserts that reduced fares are the only way to induce tourists to go to Europe in the winter months. He believes that when the trans-Atlantic airlines review the winter traffic situation later this year, consideration should be given to reducing the roundtrip excursion rates even more than 25 percent, making the ticket valid for more than a 30-day stay aboard, and lengthening the period when the reduction is in effect.

SHORTLINES

▶ **Aerovias Nacionales de Colombia**—Planned to inaugurate twice-weekly DC-4 service from Bogota and Barranquilla, Colombia, to New York via Miami on Apr. 20. An affiliate of Pan American Airways, Avianca has been operating nonstop between Bogota and Miami since January, 1947. Route extension to New York was approved by CAB three months ago.

▶ **Air Line Pilots Assn.**—David L. Behncke, ALPA president, has been re-elected president of the International Federation of Air Line Pilots Assns., which includes organizations from 18 nations.

▶ **All American**—Has begun regular feeder service from Washington, D. C., to Atlantic City, N. J., via Baltimore, Dover, Del., and Millville, N. J. Flights from Washington and Baltimore to Wilmington, Del., and Philadelphia via Easton and Salisbury, Md., and Georgetown and Dover, Del., are slated to start this week. AAA's Washington-Pittsburgh and Pittsburgh-Atlantic City links were activated previously.

▶ **BOAC**—Claims it carried more passengers and had a higher payload per trip than any of its trans-Atlantic competitors last year. Carrier made 503 trans-Atlantic crossings in 1948 with its six Constellations, carrying nearly 13,000 passengers—an average of 25.8 per trip.

▶ **Canadian Pacific**—Plans to inaugurate bi-weekly service from Vancouver to New Zealand and Australia on July 13 using Canadair. Four aircraft. . . . CPA lost $193,645 on its domestic operations in 1948, compared to a $548,266 deficit in 1947.

▶ **DNL**—The Norwegian member of the Scandinavian Airlines System has decided to dismiss 30 of its 80 pilots as an economy move. Swedish and Danish branches of SAS made similar curtailments recently.

▶ **Northwest**—Has declared a regular quarterly dividend of 28¾ cents a share on its 4.6 percent cumulative preferred stock. The dividend, totaling $112,250, is payable May 1 to owners of record Apr. 20.

▶ **Pan American**—Has received CAB authorization to suspend service at Washington, D. C., as a co-terminal on its North Atlantic route for another year. PAA said it would lose money if forced to serve Washington with the present traffic potential . . . Company flew 2253 passengers in and out of Alaska last month—25 percent more than any previous March.

▶ **Totem Air Service**—CAB has refused to grant the nonscheduled operator's request for a special exemption to operate between Sitka, Alaska, and Seattle.

▶ **United**—Has declared a regular quarterly preferred dividend of $1.125 a share payable June 1 to stockholders of record May 18 . . . Curtis Barkes has been elected vice president-finance and property.

CAB SCHEDULE

Apr. 25—Oral argument in TWA-Delta equipment interchange case. (Docket 2346)
Apr. 25—Hearing on seasonal service to Lake Tahoe. (Docket 3623)
Apr. 25—Prehearing conference on Purdue Aeronautics Corp. request to conduct Lafayette, Ind.-Chicago lightplane shuttle service. (Docket 3713)
Apr. 26—Prehearing conference on Carco Air Service's application to conduct lightplane service between Albuquerque and Los Alamos, N. Mex. (Docket 3629)
Apr. 27—Prehearing conference on extension of KLM's West Indies-Miami foreign air carrier permit. (Docket 3683)
Apr. 28—Prehearing conference on renewal of Expreso Aereo Interamericano's Havana-Miami foreign air carrier permit. (Docket 3717)
Apr. 28—Prehearing conference on renewal of Southwest Airways' feeder certificate. (Docket 3718)
May 2—Hearing on Los Angeles-Honolulu service in reopened Hawaiian case. (Docket 851 et al)
May 2—Hearing on additional southern transcontinental service. (Docket 1102 et al)
May 3—Prehearing conference on renewal and amendment of Pioneer Air Lines' feeder certificate. (Docket 3719)
May 9—Hearing in Empire Air Lines' certificate extension case. (Docket 3649)
May 9 or 16—Hearing in North Atlantic route transfer case. (Docket 3589 et al)
May 16—Hearing on Hughes Tool Co. control of TWA. (Docket 2796)

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SMALL AIRCRAFT Plant in East wants production-minded Quality Engineer-Inspector and experienced Production and Material Control Man. Write complete qualifications to P-8715, Aviation Week.

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STRICTLY PERSONAL

OLD GAG DEPARTMENT—This column discovers new readers every day. **Bea Mullin**, McGraw-Hill teletype operator, says she wishes all of the Business Week and Aviation Week copy she sent was like this. And our own **Bill Kroger** wrote us an indignant note because we fell for last week's gag from the deHavilland Gazette about the lady who became a mother on an East African Airways crate. Kroger says:

"Taint the way I heerd it. It's one of the oldest gags in aviation, circa 1936. Imperial Airways then had the world's longest route—London & Melbourne—and the world's slowest planes. So Imperial constantly emphasized that comfort was an advantage over speed.

"Anyhoo, over India or thereabouts, the lady had her baby. In pained anger the pilot said: 'Mahdahm, why did you get aboard this crawft in this condition?' To which she replied, haughtily: 'Sir, I'll have you know I was not in this condition when I came aboard.'"

* * *

PLANE RIVALRY SPLITS A FAMILY—The New York papers got a kick out of **Arturo Toscanini** letting his wife go to Europe by Air France the other day while he waited for the boat. Reminds us of a more air minded couple, but just as independent, that Delta Airlines reports.

It seems the stewardess on the Delta non-stop Chicago to Miami run was asked shortly after takeoff if she knew where a Miami-bound Connie was. The questioner was an eager window-watcher. By chance, the stewardess spotted it. It wasn't long before he repeated his question. He seemed so distraught that the dutiful girl asked the captain to inquire by radio.

"Right behind you," came the EAL pilot's answer. The man was jubilant.

It then developed that he and his wife were both flying to Miami but he liked the DC-6, and she demanded the Connie, so they went their separate ways and promised to meet each other at Miami airport.

Yes, as you'd guess from the source of our story, it was hubby who was waiting when the second plane arrived.

* * *

PERSONAL BUT NOT STRICT—**Hy Sheridan**, just back from another American Six jaunt, confides that **Sadie the Stewardess** in discussing supersonic flight again, says she cannot understand why men want to travel faster and faster seeing as how the ideas are the same at both ends. "She says that when we fly so fast that anywhere is nearby, it won't be any use goin'. She says the human race was made by men who stayed a while. She says she likes a man who is fixed—well fixed."

* * *

COMPLAINT DEPARTMENT—If you do not care for the contributions to this column, please send in a few you like better. This column cannot continue without a constant flow of new stories. (Maybe it would be a break for business journalism if it did not continue!)

* * *

BIRTH OF A WASHLINER—**Joe Ferris**, Northwest Airlines publicity tycoon, sends us the latest in aeronautical-type birth announcements, distributed by Al Wash. Papa Al is NWA's Seattle publicity representative. The statement was sent out as a press release:

"Delivery of the second of a fleet of long-range, high-speed male planes was announced today by the Wash Line, a small but growing heir transport concern. The announcement of the new model was made from the company's headquarters at 5606 59th Ave. N.E., Seattle, by Patty L. Walsh, executive vice president and general manager, and Allan J. Wash, Jr., chairman of the board.

"Operating weight (empty) on arrival was announced to be 8 pounds 4 ounces but it is contemplated that the maximum gross of this craft will be increased markedly in the near future.

"The new aircraft is reported to be similar in external appearance to the model presently operated and will probably have the same flight characteristics. Fuel consumption is expected to be no problem, since it can cruise for a day on approximately four pints of milk. A feature of the new craft is a water ejection system.

"Only problem that the owners see in introducing the plane to regular service is one of reducing the noise level apparent when it is operating at full power.

"A name has not been selected for the sleek little craft but company officials indicated that it would be christened in the near future with appropriate ceremony." R.H.W.

WHAT'S NEW

New Books

"Aircraft Maintenance and Repair," third in a series prepared by the Northrop Aeronautical Institute technical development staff. Previous books in the Aviation Text series covered aircraft basic science and aircraft powerplants. Over 400 pages, published by McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y. Price $6.

"Air Transportation and Traffic Management," to be published soon, by Thomas Wolfe, vice president, Pacific-Alaska division, Pan American Airways. Covers three phases of air transportation—economics, revenue, and sales. To be published by McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y.

"Formula for Supervision," by H. W. Heinrich, outlines application of supervisory control to secure sate, efficient work performance. 96 pages, paper cover, available from National Foremen's Institute, Inc., Deep River, Conn. Price $1.

"Partners in Production," an analysis of goals of both labor and management, prepared by the Labor Committee of the Twentieth Century Fund, 330 W. 42nd St., New York 18, N. Y. Price $1.50.

"Rotating Wing Activities in Germany During 1939-1945," BIOS Overall Report No. 8, available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. Price $1.

Trade Literature

"Catalog," covering weather instruments, chronometers, navigation equipment, etc., available upon request to Pan American Navigation Service, 12021 Ventura Blvd., North Hollywood, Calif. Ask for catalog M-9.

"Catalog of Scotch and Industrial Pressure-Sensitive Tapes and Their Uses," listing tapes by types and functions, available upon request to Robert Spector Co., 22 Park Place, New York 7, N. Y.

"Catalog 3460," covering B. F. Goodrich's complete line of air hoses and featuring the company's Highflex brand. Available upon request to B. F. Goodrich Co., Akron, Ohio.

"Booklet B-3896," containing basic information on Type E industrial turbines. Available upon request to Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.

ADVERTISERS IN THIS ISSUE

AVIATION WEEK—APRIL 25, 1949

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EDITORIAL

Cream Skimming and Progress

For months the Air Transport Assn., pouting and stolid, has wailed bitterly that the nonscheduled airlines have been "skimming the cream" of the air traffic.

Now, not one nonsked that we know has charged as much fare as the scheduled carriers. So if the ATA thus admits that it knows the low-priced consumer is the "cream" of the air travel market, would someone please come forward and explain why the scheduled carriers let someone else capture this cream first? They have been operating under the present law since 1938, and they have wide freedom in setting their own passenger rates.

If, however, ATA means that the "cream" is the long-haul traffic, then once again, would someone please tell us why—if they recognize the value of this long-haul carriage trade—they have not met the full demand for such service? Why has an entire new industry been able to win over thousands of transcontinental passengers in an incredibly short time, with so little promotion? Especially when these nonsked services are slower, less comfortable, without meals. Is this the cream of the traffic? The scheduled transcontinental carriers have had the wherewithal to lap up this cream but obviously have failed to do it. Why? Everything was on their side—law, experience, know-how, flying equipment, maintenance shops, sales personnel—perhaps everything but top management savvy.

Top management of the established industry has been underestimating aviation, underestimating the airmindedness of America. Until recently, it has been more interested in keeping the subsidy spigot open than in building air transportation on sound economic lines. Top management of some of the nonskeds, scrawny but agile, have not made these mistakes. They have crept in from the other side of the tracks and lapped up this cream the fat cats haughtily scorned. The fight is on. The interlopers will probably be forced out, except for a few. Certainly, a few should be permitted to remain.

For the scheduled carriers, awakened by the fight, are finally making vigorous action in reducing fares, improving service, and making it difficult for CAB to perpetuate the nonskeds. And Washington talks of separating the subsidy carriers from the service compensation carriers. This is good for the industry. It will encourage more efficiency.

As Aviation Week has forecast for so many months, the Congress and the public are tiring of ever rising subsidies, ever rising fares, service too often designed to meet the carriers' rather than the public's needs, while low cost operators who would offer a yardstick of competition are ground under the bureaucratic heel.

The Senate's investigation into the airlines brings this judgment day much closer. So does CAB's new, stiffer policies, as bungling as several have been recently. But don't let that preliminary bungling hoodwink anyone. The trend is unmistakably toward a tougher CAB, and rightly so.

Does all of this criticism of ours appear anti-industry? Could be, if you are looking down your nose through those short-range bifocals.

But Aviation Week feels this way. Air transportation could become the most economical transportation in all history. Our aircraft already lead the world. Who else but America can achieve that dream of ultimate utility? Our latent air transportation potential is unbelievable. But only mass public usage will bring the maximum of peaceful, commercial achievement, and permit us to keep it.

Only private, competitive business will maintain the full vigor of air transportation. Government regulation and control will grow in proportion to subsidy. The trend, then, must always be away from subsidy, never toward more of it. We have the government controlled airlines of Great Britain as the horrible example of government ownership.

Perhaps we shall never eliminate subsidy. But let us not wrap ourselves in camouflage and depend on the alibi that others get, or have gotten, more subsidy than the airlines.

It is true that they have. But look at them. Do we envy the railroads today? If the railroads had had the gumption to modernize their rolling stocks and their rights-of-way, to speed up their service over the years, improve their schedule frequency, do you think buses and trucks would have grown at the phenomenal rate they have? We doubt it. Too many John Q. Publics got fed up with cinder showers, slow freight, infrequent trains, and a general complacent attitude of "the public be damned."

Why should aviation make the same stupid errors of its predecessors? Why can't commercial air transportation struggle like a demon to throw away the crutches of subsidy and stand on its own feet and slug it out with its competitors in the old American spirit of private enterprise, competition, and better public service?

ROBERT H. WOOD

TOP FLIGHT

- MOTORS AND CONTROL
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- GENERATORS AND TRANSFORMERS

"Top-Flight" engine performance played a large part in the establishment of the new world speed record set by the F-86, powered by a General Electric TG-190 (USAF Type J47) turbojet. "Top-Flight" men also had a large role. One of these men is E. S. "Tommy" Thompson, Manager of Sales for the Aircraft Gas Turbine Divisions, shown accepting one of the triplicate awards made to the Air Force, North American Aviation, and General Electric by the National Aeronautic Association.

Tommy was in on the design and production of the first turbojet engine in the United States—the General Electric IA. Tommy worked with England's Whittle, Air Force officers, airframe manufacturers, and expert design men like Sam Puffer and D. F. "Truly" Warner. He supervised the installation of the historic IA engine and saw it grow from a plan to a practical, powerful reality.

Today G-E research and engineering are continuing to serve the aviation industry by developing and producing engineered systems and precision products for aircraft. Take your problems to the G-E office nearest you, or write *Apparatus Department, General Electric Company, Schenectady 5, New York.*

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