AVIATION WEEK

DEC. 15, 1947

INCORPORATING AVIATION AND AVIATION NEWS

A McGRAW-HILL PUBLICATION

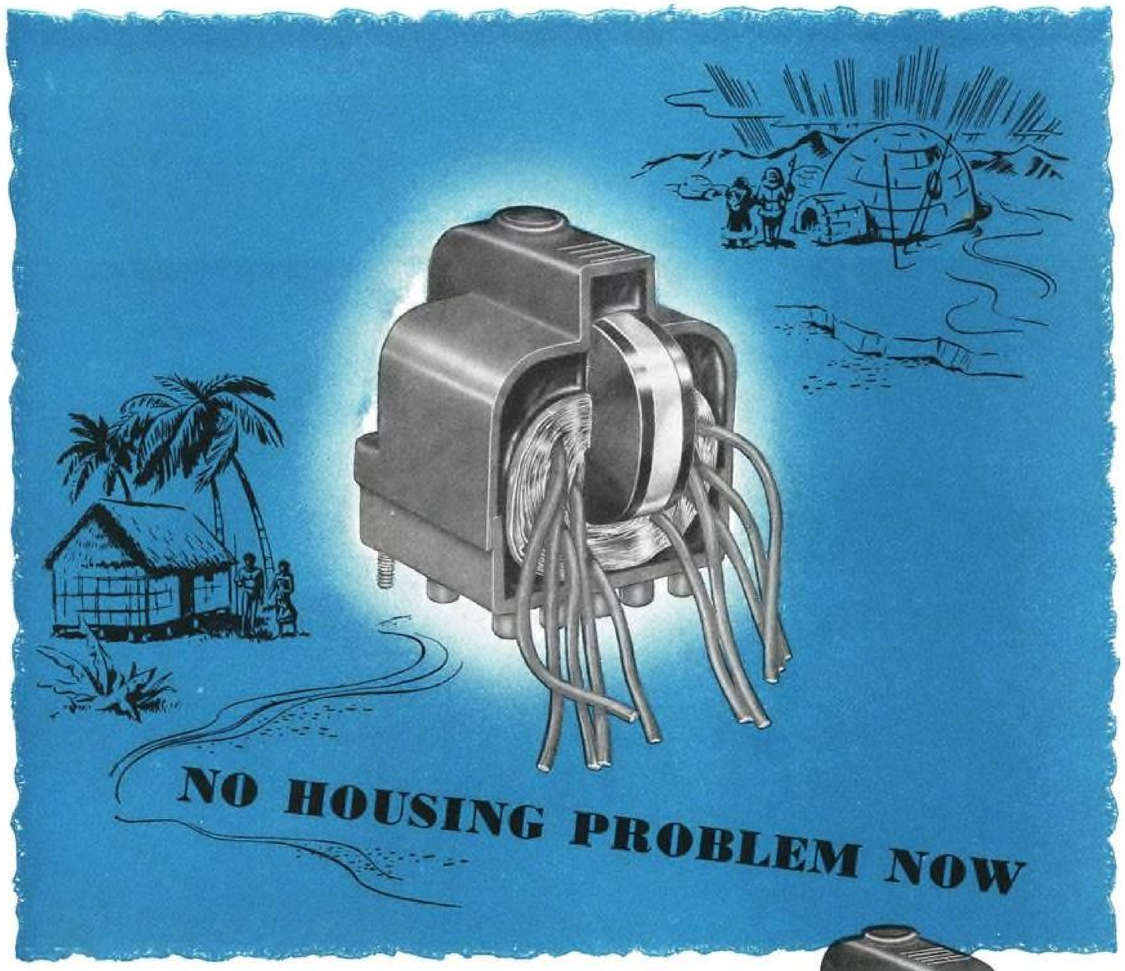
2 FOR THE 2-0-2

Two great Goodyear teams — wheels and brakes, tires and tubes — are on the new 2-0-2, Martin's high-speed luxury passenger plane. The majority of aircraft manufacturers and airline operators specify Goodyear landing gear equipment to assure the utmost safety and dependability during take-off and landing runs.

Here's why you get maximum safety when you specify Goodyear: light, super-strength magnesium alloy wheels — time-proven, self-adjusting Single Disc Brakes —extra-rugged, longer-lasting tires and tubes. To secure complete information about Goodyear aviation products, write: Goodyear, Aviation Products Division, Akron 16, Ohio or Los Angeles 54, California.

MORE AIRCRAFT LAND ON GOODYEAR TIRES THAN ON ANY OTHER KIND

GOODYEAR AVIATION PRODUCTS



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FROM arctic to tropic conditions within a matter of minutes is an everyday occurrence for many aircraft. Ordinarily, a result of such sharp, sudden changes would be rapid deterioration of the transformers in a plane's electronic equipment. But here, Honeywell Creative Engineering anticipated the need for special protection—and developed the answer.

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AVIATION WEEK

Vol. 47 No. 24 — Dec. 15, 1947

INCORPORATING AVIATION AND AVIATION NEWS

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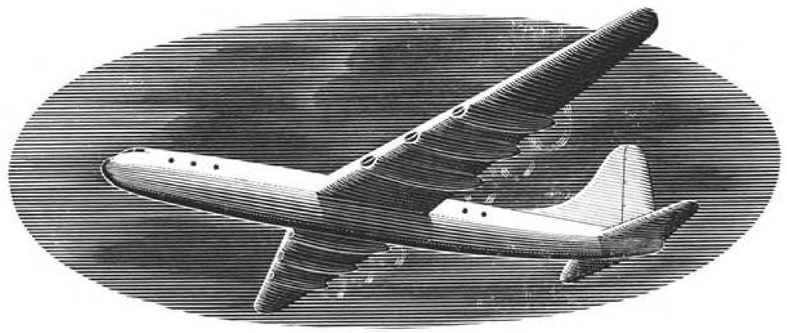

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AiResearch oil temperature regulators, as well as intercoolers, are famed for their sound, rugged construction. *There has never been a reported failure of AiResearch mechanical joint construction in service.*

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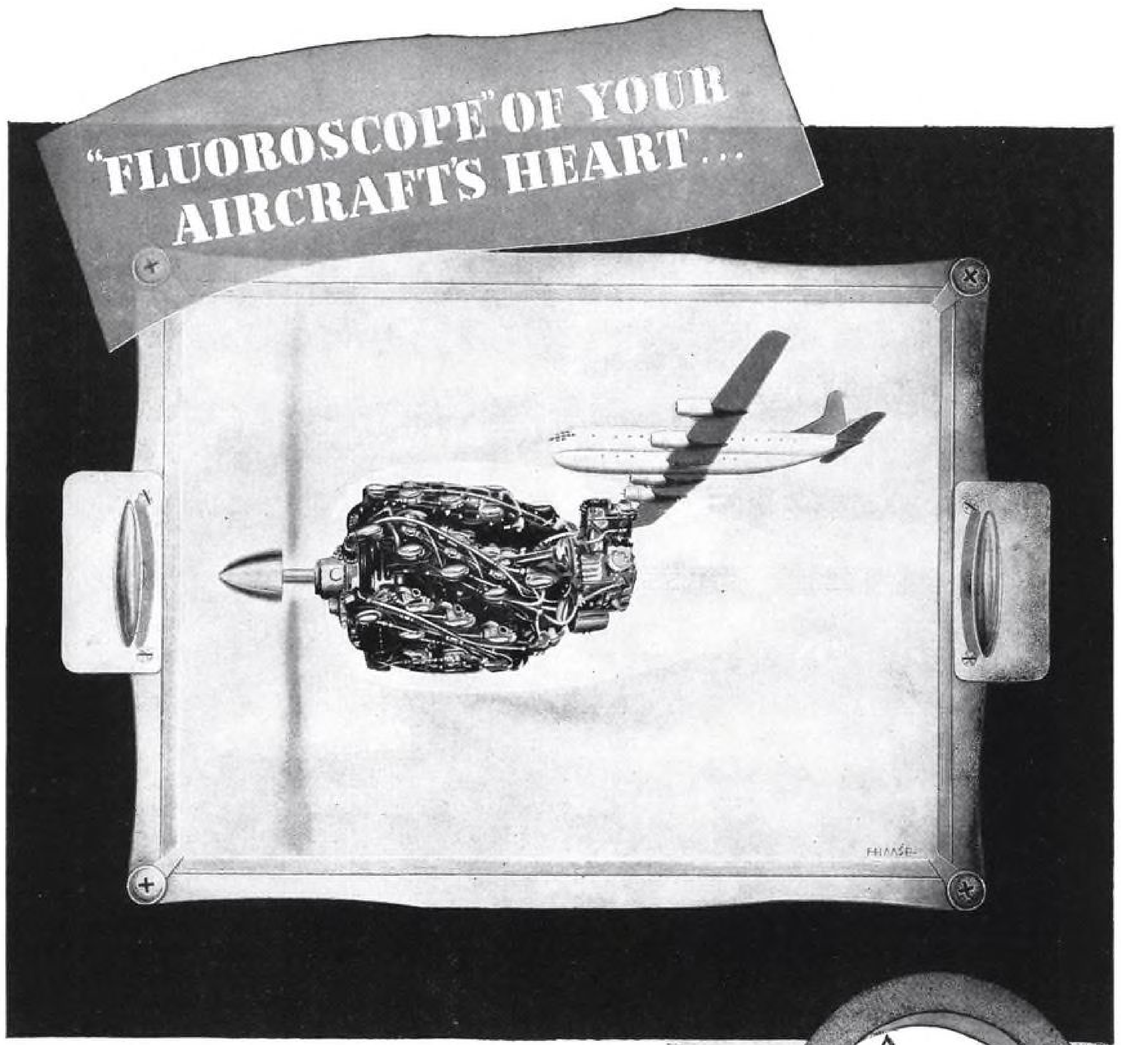

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THE AVIATION WEEK

EVOLUTION OF NAVAL THINKING—It is apparent from the statement of Secretary John L. Sullivan before the President's Air Policy Commission that in matters aeronautical the U. S. Navy (as is said in Detroit about the automobile industry) progresses through evolution and not revolution. The Navy, due to the times and the circumstances, has found it advisable to make concessions to aviation. But it has not radically altered its thinking.

The simplest statement perhaps would be that the Navy with a sincerity of purpose and efficiency of operation that has always characterized its activities is preparing to use aviation in fighting—if that becomes necessary—another Navy.

This Navy approach to the problems of national defense is as much a product of a state of mind and years of mental conditioning as it is of a strategic concept. Aviation must be adapted to developments in the Navy, and not the reverse. But the Navy cannot publicly state its policy and psychology so bluntly. Despite unification of the armed forces, it is still competing with the Air Force in size, importance and in budgets.

It therefore calls upon the glamor and substantial achievements of the Navy in World War II to point up the importance of the Navy to national defense. That was the warp and woof of Secretary Sullivan's statement.

WELL DONE—In the face of topside naval attitude toward aviation, the amazing fact is the high efficiency and morale of naval aviation. There are no better operations—whether in transport, training, combat or public relations—than those of the Bureau of Aeronautics. Over the long pull, this may be the factor leading to a realignment of naval thinking regarding aviation.

Promotions in future years of the now-young naval aviators may put them in position to exercise a determining influence on the Navy's outlook.

This is a possibility, by no means a probability. The Navy today has gone very little beyond the concept of naval aviation outlined to this writer a dozen years ago by Ernest J. King, then a rear admiral and chief of the Bureau of Aeronautics. Stern-visaged then as he is now, Adm. King laid down the precepts on which were based the Navy's use of airplanes: (1) They support the fleet by patrol and scouting, and reporting back on size, composition and disposition of an opposing force; (2) They extend the striking range of the fleet either through direct attack or diversion; (3) To make it possible for planes to do these things their pilots and commanders must be Navy officers first and aviators second; (4) A term at sea —either in a command or executive post—is essential for naval aviators to give them proper appreciation of the duties, powers and limitations of the fleet.

In World War II, the "blue water admirals" made grudging concession to the necessities of the situation and departed almost completely from all of those precepts. The Navy still maintains, however, that naval aviators were better equipped than other airmen to identify surface ships, due to their Navy training and background. This is, at its mildest, debatable.

THE NAVY WAY—An impartial observer would tend to grant that right now and at least until the Air Force fulfills its long-range strategic bomber program the Navy has valid claims to a strong air arm. The question of how well that air arm can be keyed to the needs of an over-all national defense policy is the question of how well the junior air officers of the Navy can retain their aviation concept as they progress up the promotion ladder.

Promotion in the Navy rests as much on seniority and "connections" as it does on ability. Few young naval aviators, despite any zeal for aviation, are making the "mistake" of Billy Mitchell and lashing at the top command. But they see an inevitable change coming.

FUTURE NAVY—As the most thoughtful of these naval aviators envision the change, it exemplifies the evolutionary, rather than revolutionary thesis.

They accept the premise at the start that the day of the battleship is past. Some will similarly relegate to the scrap heap cruisers. Submarines are a strategic weapon as important against enemy shipping as long-range land-based bombers are against enemy industry. Destroyers and smaller combat craft are perhaps necessary against enemy submarines. They are also necessary for the same purpose that some naval aviators see a future for cruisers: protection of carriers.

To a large extent, the future Navy seen by these aviators is one that would exist almost primarily to support carrier operations. And carrier operations, in turn, would support coastal invasions as a supplement to the Air Force's strategic bombers.

This concept comes close to being radical inasmuch as it views the future Navy as being primarily a tactical air force for employment in amphibious operations. But any such development will come about gradually.

The naval aviators thus rationalizing the change the airplane has brought in the waging of war are not zealots. They are Navy officers imbued with the quiet but unshakable conviction that the Navy way is the best way.

The Navy is among the more successful government agencies in winning support from both the public and Congress. It was caught off guard by the Air Force statement before the Policy Commission but it is not yet ready to relinquish control over its own destiny, even though nominally under a Secretary of National Defense. Sullivan's statement was a rebuttal serving notice that the Navy intends to fight for the right to change slowly.

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SECOND ANNUAL

Air Transportation Institute

Jan. 7th through Jan. 30th, 1948

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Protek-Plugs also prevent fogging, condensation and fungus growth in optical and electrical equipment, have many other applications, too. This low-cost protection will effect a real saving to you. Why not write for full information?

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NEWS DIGEST

DOMESTIC

Convair XC-99 world's largest landplane, was aloft 2 hr. 40 min. in second test flight, over San Diego, at 235,000 lb. gross weight, a 15 ton increase over takeoff gross for maiden flight. Third flight of six-engined double-decker military transport will be made after several weeks of minor modifications, and Air Force change orders.

Bendix Aviation Corp. was one of seven defendant firms named in antitrust suit filed in southern district New York U. S. Court by Atty. Gen. Tom C. Clark, in connection with alleged monopoly of manufacture and sale of braking apparatus for motor vehicles and industrial equipment.

United Aircraft Corp. has elected Ostrom Enders, president of the Hartford National Bank and Trust Co., to its board of directors.

FINANCIAL

Cessna Aircraft Co. during year ended Sept. 30 showed net income of $371,965, equal to 53 cents a share, compared with $296,443, or 42 cents a share, in the year ended Sept. 30, 1946.

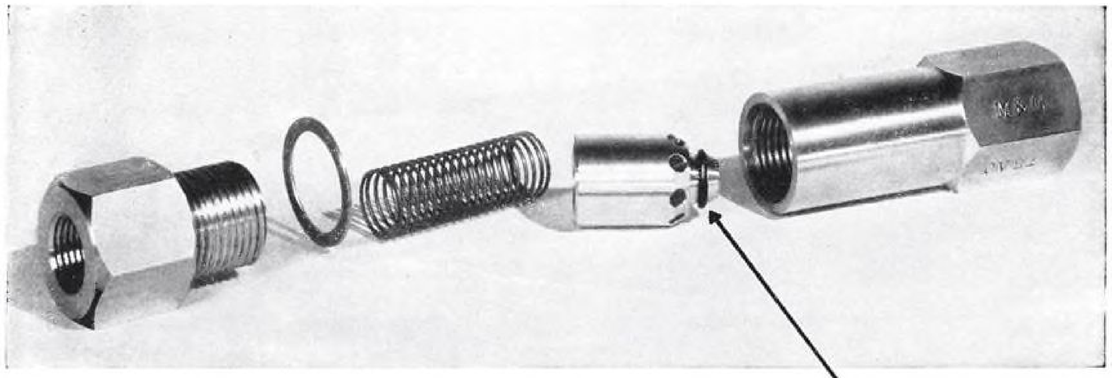
FOREIGN

USAF Turkish Mission, headed by Brig. Gen. Earl S. Hoag, is preparing to go overseas to carry out a proposed $25,000,000 program to equip Turkey with U. S. combat planes used in World War II, including principally types such as P-47 and P-51 fighters, and A-26 and A-20 light bombers, drawn from war surplus stocks in the European theater. Mission is also charged with seeing that Turkish Air Force is trained in maintenance and use of planes supplied.

Society of British Aircraft Constructors states preliminary flights of a new British-designed helicopter accommodating 24 passengers or three tons of cargo and cruising at 116 mph. will probably be held next spring. Known as the "Air Horse", the craft is being built by the Cierva Autogiro Co., Southampton, and is powered by a 1,640-hp. Merlin engine.

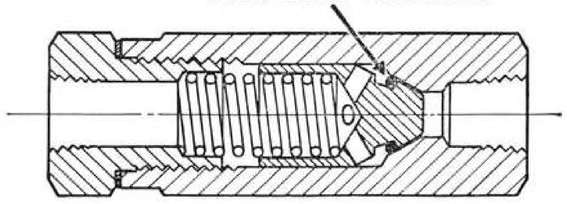
China National Government is negotiating for purchase of 600 American surplus transports, and negotiations will include arrangements for conversions and overhauls by American firms.

U. S. State Department officials predict early break in 7-month stalemate on commercial air agreement between Argentina and U. S. Bi-lateral agreement was approved last May, but has not been operative, because of delay in designating reciprocal routes.



"O" rings make Perfect Seals at 15,000 psi — *even with Grit in the System!*

TWIN SEAL PRINCIPLE



Effectively combining the conventional metal to metal seat with a resilient Linear "O" ring seal makes a tight check valve—completely dependable at 15,000 psi. It can be operated with oil, air, water or any liquid not destructive to synthetic and natural rubber.

Linear "O" rings, used in the Mansfield & Green Twin Seal Check Valve, are absolutely tight and show the simplicity of an "O" ring installation. The "O" ring, a tight seal against high pressures, works equally well on low pressures or vacuums.

Linear "O" ring packings, precision moulded to close tolerances, are made of highly resilient synthetic rubber compounds and are adaptable to a wide range of temperatures, pressures and fluids.

Many tough problems are being solved by Linear design and skill. Linear's facilities and engineering experience are available to you. Get complete data by sending a statement of maximum pressure, temperature range and the fluid to be handled.

LINEAR INCORPORATED — OVER FORTY YEARS PACKING EXPERIENCE

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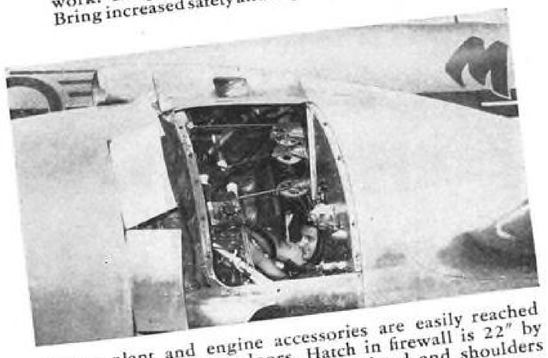
World's leading twin-engine airliner, the Martin 2-0-2, features provisions for low-cost maintenance.

Easy to "Get At.."

Even the Martin 2-0-2's fuel cells are easily and quickly installed or removed. Tough, flexible Mareng fuel cells, an exclusive feature of the Martin 2-0-2, eliminate excessive riveting, intricate corner assemblies and troublesome metal work. Keep fuel cell maintenance costs at a minimum. Bring increased safety and dependability to the Martin 2-0-2.



Power plant and engine accessories are easily reached through large access doors. Hatch in firewall is 22" by 24"—large enough to admit a man's head and shoulders—and gives access to hydraulic reservoir, accumulators, brake cylinders, main electric disconnects and rear of instrument panel. Side opening facilitates major maintenance—saves time, cuts costs.

One hundred twenty servicing and maintenance access provisions. That's what makes the Martin 2-0-2 so easy to "get at." Conveniently located throughout the 2-0-2, numerous doors and hatches facilitate routine service and major overhauls . . . expedite non-scheduled repairs. Main illustration shows accesses to the prime maintenance compartments in the under-floor section of the fuselage. Each compartment contains a major maintenance location with accessories grouped according to class. Each is illuminated by built-in flood lights. Each is conveniently reached from ground-standing position. These and other built-in, time-saving features bring new, low-cost maintenance to airlines operating Martin 2-0-2's.

THE GLENN L. MARTIN CO., BALTIMORE 3, MD.

Martin AIRCRAFT

Builders of Dependable Aircraft Since 1909

NEWS SIDELIGHTS

A HATE-LANDIS CAMPAIGN

An inspired propaganda campaign against CAB Chairman James M. Landis is reaching a crescendo as the official approaches the end of his term. Sentiment among top officials of the "big four" trunklines, as well as smaller carriers, is definitely anti-Landis, and hope there is high that the Chairman will not be reappointed. Airline bigwigs are beating the drums for CAB replacements who have an "industry" viewpoint. In any case, they feel a successor for Landis could hardly be as independent of airline politics as the incumbent.

SYMINGTON SURPRISES

Navy was caught with its classifications down by Symington's layout of Air Force needs before the Air Policy Commission and is rushing frantically to declassify its data so that it can issue a similar public plea. Navy Secretary Sullivan gave a relatively vague breakdown on naval aviation requirements to the policy group.

AVIATION WEEK's comment that Symington had committed the biggest breach of security in recent history by his amazingly frank details of Air Force plans and needs was confirmed by the inquiries received by AVWEEK's Washington office from Air attaches of foreign powers to check figures given in Symington's statement.

LOOKS LIKE THE OLD P. O.

What appears to be a sudden flip-flop in the Post Office Department's attitude toward helicopter mail operations in metropolitan districts has some observers wondering if surface interests have effected a coup. With the Post Office Department's approval, CAB last month scheduled the New York Area Helicopter Case for prehearing conference on Dec. 10. On Dec. 8, the prehearing session was "indefinitely postponed." The P. O. states it has not gone "bearish" on helicopter operations but that another mail count survey and other studies are necessary to bring New York area statistics up to date. Under Gael Sullivan, former second postmaster general and enthusiastic helicopter service proponent, extensive flight tests were conducted in the New York area last January.

WHAT D' YA READ?

You can pay your money and and take your choice of charges appearing in some publications that CAB is harshly anti-industry, or read elsewhere that it is pro-industry. The charge that the latch-string on some CAB members' doors has been too readily available to top airline executives is now echoed by ALPA president David Behncke in his union magazine. He advises CAB to "surround itself with more dignity and become less easy to talk to." The union chieftain also believes that too many people accept CAA and CAB jobs as a stepping stone to higher-paid positions in the industry. He recommends that persons resigning from the two agencies be barred from employment with any aviation company for a period of sufficient length to make CAA or CAB employment on a temporary basis unattractive.

ELECTED I.A.S. PRESIDENT

John K. Northrop, president of Northrop Aircraft, Inc., and pioneer flying wing designer, has been elected president of the Institute of the Aeronautical Sciences for 1948. Recognition of Northrop has mounted this year with Wright Brothers medal, Wright Brothers lecture in London, and I.A.S. presidency, following 20 years of work on his flying wings.

BREWSTER'S TURNABOUT

Maine's GOP Sen. Owen Brewster, long a stubborn prophet of doom for U. S. overseas air transport under the system of regulated competition, has changed his mind. Reporting, after a survey trip through Europe, that the U. S. is now in the dominant position in international air transport, Brewster now tells AVIATION WEEK that he was "in error" in his prediction that foreign carriers would drive U. S. carriers from the sky—unless they were unified as a chosen instrument. Foreign lines for the foreseeable future, Brewster estimates, will rely on U. S. plane types. Plush air transport territory now at stake, he says, is Germany, barred from operating its own system. The Scandinavian countries have a plan for capturing this territory, he reports.

MITCHELL AND CAB

Former Sen. Hugh Mitchell of Washington has left the door open for his appointment to a Democratic vacancy on CAB which, reportedly, might occur with expiration of the present term of CAB Chairman James Landis at the end of the year. Queried in Seattle on reports that he was a top White House choice to succeed Landis, Mitchell responded that such an appointment would be "a great honor" and that were the offer made him, he would certainly give it "serious consideration." During his brief Senate service, Mitchell authored legislation creating an Air Policy Board, subsequently created by Executive Order.

CONTINUOUS PROGRAM

The No. 1 proposal of the national defense organization before the current Congress will be to liberalize procurement procedures sufficiently to plan continuous programs for both military and the supplying industries. However, Symington has said he thinks no special legislation is necessary since previous attorney generals have ruled that restrictions do not apply to funds spent for equipment, and Attorney General Clark is expected to give a ruling clarifying Air Force position in this regard soon. Navy and Air Force want assurances from Congress of approval of more than single year programs for procurement.

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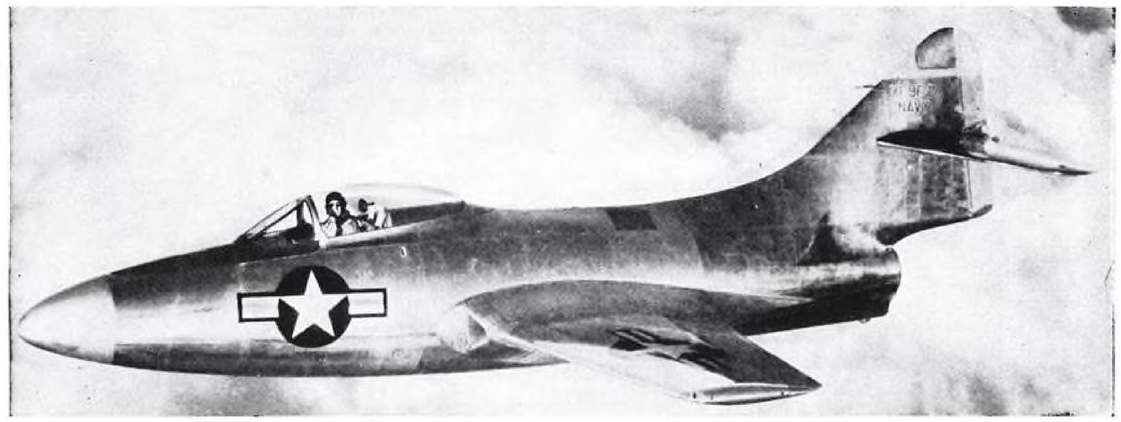
Dec. 15. 1947

INCORPORATING AVIATION AND AVIATION NEWS



Navy Reveals Grumman Jet Fighter

Panther powered by British Nene engine has new solution to jet carrier landing problems; 650 mph. top speed.

By ROBERT McLARREN

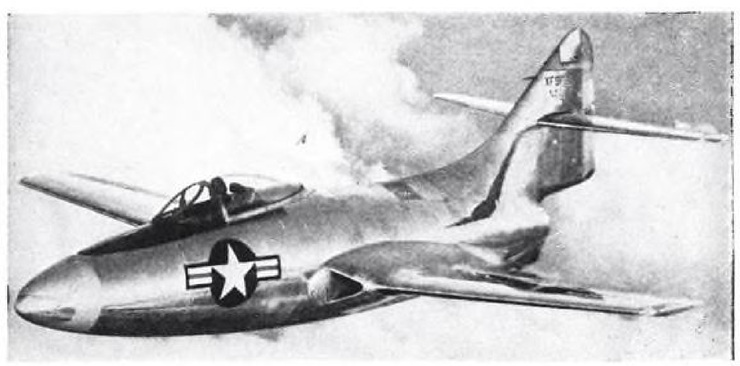
Completion of the Grumman XF9F-2 (Panther) marks the long awaited entry of Grumman Aircraft Engineering Corp. in the jet field. With a speed approaching the 650 mark and a ceiling above 45,000 ft., the new fighter is marked for quantity production as standard Navy jet fighter.

Grumman engineers have produced a jet fighter capable of getting off a carrier deck in 450 ft., a figure competitive with the best reciprocating engine fighter and phenomenal performance for a jet powered craft. This has been accomplished through the use of blower doors which induce an accelerated flow of air through the engine plenum (air compartment) chamber, providing a high energy air flow at comparatively low airplane speed, now the chief difficulty with conventional jet types.

▶ **Blower Doors**—These doors, two large ones along the upper keel behind the cockpit and two smaller doors lower and to the rear, are opened for takeoff, producing a high air flow which permits the jet engine to obtain its maximum static thrust at the time it is most needed. Blower doors are also opened during the landing approach and preserve the flow through the air intakes at a time when other jet engines suffer from stalling of the lower lip of the duct intakes. This solution permits a considerably higher angle of attack and, therefore, higher lift and lower landing speed.

Powerful aid to obtaining the Panther's landing speed of only 80-85 mph. are "droop snoot" wing nose flaps, which create high camber and, in combination with exceptionally large wing and fuselage flap panels, produce a low stalling speed through a lift co-efficient far higher than any other jet plane and higher than most conventionally powered craft.

▶ **Use British Nene**—Much of the high performance of the Panther results from the use of a British Rolls-Royce Nene turbojet engine developing 5,000 lb. static thrust and up to 5,750 lb. of thrust with the use of water injection equipment installed on the XF9F-2. This powerful engine, designated J-42, will be produced by Pratt & Whitney, with the first engine, a J-42-P-2, scheduled for completion in March, 1948. Quantity production is slated to be under way by October. Pratt & Whitney modifications include redesign for Air Force-Navy standard parts, standard U. S. accessories and provisions for water injection and tail pipe afterburning. P&W engineers are already thinking in terms of 6-7,000 lb. of thrust out of the unit within the foreseeable future.



Completely interchangeable with the P&W Nene is the new Allison J-33-8 turbojet engine developing 4,600 lb. of thrust dry and 5,000 lb. with water injection. Production of the F9F will feature alternate installations of the two engines as they become available. The first two XF9F-2 prototypes are powered by imported Rolls-Royce Nene engines with the third prototype to be powered by the first of the new Allison engines.

▶ **Interchangeable Nose**—The Panther features an interchangeable armament, photographic and electronic nose with a variety of machine guns, cannon, cameras and radar units mounted in various nose configurations. The nose slides forward on rails to permit servicing of installed equipment and fast change of nose types.

Unusual tail configuration of the Panther meets the requirements of a short tail pipe developed through experience with conventional long tailpipes, which revealed pumping losses varying directly with the length of the tailpipe. Cutting the tailpipe short created the odd "barracuda" shape of the F9F aft end.

▶ **Radical Revisions**—The Panther represents a radical revision of the original XF9F-1 which was to be powered by a series of Westinghouse 19XB units mounted in the wings. A total of six, later reduced to four, was specified. Impracticality of this arrangement and the Navy decision to import Nene engines resulted in the present configuration of the airplane. Chief designer of the airplane is Dick Hutton, Grumman assistant chief design engineer. Engineering of the airplane was in the hands of Robert Hall, former air racing designer and longtime Grumman test pilot and who is now assistant chief experimental engineer, and Gordon Israel, equally famed air racing designer (of Ben O. Howard's "Mr. Mulligan" and subsequent Howard designs) and F9F project engineer. The project was coordinated by Marine Major Ross Mickey, BuAer F9F project officer and Lt. Comdr. W. J. Patterson, BuAer P&W Nene project officer.

Delay Forecast In DC-6 Return

Modification committee estimates some may be in service by mid-February.

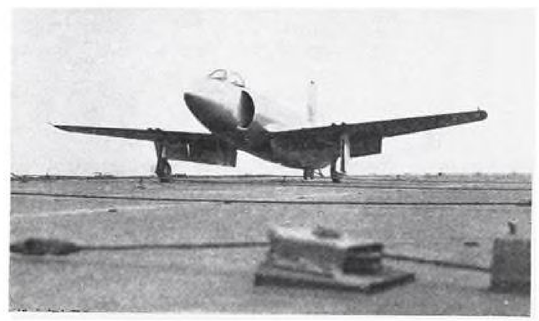
The 103 Douglas DC-6's that have been grounded since Nov. 11 will not return to airline service in any appreciable quantities before mid-February according to latest estimates of the Civil Aeronautics Administration sponsored DC-6 Modification Committee.

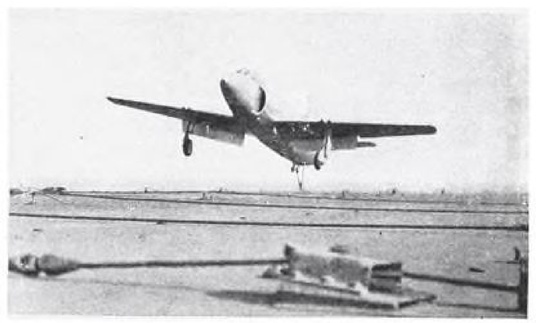
The committee, which is nearing completion of its studies of modifications that will be required before the DC-6 can return to regular service, has also come up with what it believes to be the cause of the second DC-6 fire that stimulated voluntary grounding of the planes by the airlines.

▶ **Fire Cause**—It believes that this fire in the belly of an American Airlines plane that landed safely at Gallup, N. M., was caused by gasoline fumes drawn into the cabin heater system and ignited there after gasoline overflowed through a safety relief valve in the leading edge of the wing. The overflowing gasoline ran down the belly of the plane into the air scoop for the cabin heater and pressurization system. Overflow occurred during fuel transfer operations between the main and auxiliary gas tanks. Bluish stains characteristic of high octane gasoline were found in the burned areas of the American DC-6 belly. The committee credits the same condition as probable cause of the earlier United DC-6 fire fatal to 52 persons at Bryce Canyon, Utah. No defect in the cabin heater made by Surface Combustion Corp. was indicated.

Meanwhile Civil Aeronautics Board Safety Bureau was scheduled to begin hearings on both accidents today at Santa Monica, Calif. In view of the modification committee's verdict, CAB hearings are apt to be purely academic and will have little effect on the fate of the DC-6 since the 300 mph., 50 passenger transport will have been flying again for many months before slow-moving CAB determines the causes.

▶ **Hydraulic Changes**—Another major modification in the DC-6 will involve new type joint and joint-wrappings in the hydraulic lines; a drain-off system that will prevent leaking hydraulic fluid from collecting anywhere within the plane; and replacement of present fiberglas soundproofing and baggage compartment fireproof linings with a new type of sandwich insulating material. Old type fiberglas was found to collect leaking hydraulic fluid and act as a wick in combustion of the inflammable fluid. The new insulating material, already on the market, consists of a layer of laminated fiberglas covered with a glass cloth impregnated with a vinyl plastic. The plastic cover, sealed at the sides, prevents absorption of inflammable liquids. The plastic will disintegrate at about 212 deg. F. but will not sustain combustion.





VICKERS JET ATTACKER COMES ABOARD

First photos of Vickers-Armstrong Attacker landing on H.M.S. "Illustrious" shows typical British triangular deck arrester hook and twin tail wheel. Attacker is first tractor gear turbojet aircraft. Twelve takeoffs and landings were made by M. J. Lithgow, company test pilot, and Naval Aviation pilots Lt. Comdr. E. M. Brown and Lt. S. Orr. Tests proved the Attacker suitable for carrier duty. British pioneered jet operations from carriers with D. H. Vampire in Fall of 1945. (World News photo)

SIKORSKY S-52 GETS CERTIFICATE

Sikorsky's two-place helicopter, first with all-metal blades, shows its brand-new NC. This is the second Sikorsky rotocraft to be certificated, the other being the four-place S-51. The S-52 prototype was first unveiled last year at the National Aircraft Show in Cleveland, even before it had made its first flight. Powered by a 178 hp. Franklin engine, the craft has a gross weight of 1,900 lb., range of 265 mi. and cruising speed of 87 mph.

UAL Pilots Vote To Authorize Strike

A pilot strike against United Air Lines hung fire last week as the Air Line Pilots Association completed tabulation of ballots showing wide sentiment for a walkout.

Sole point of dispute between company and pilots is a change in grievance machinery proposed by UAL President W. A. Patterson. Wages and other problems involved in drawing up a new contract had already been settled when the stalemate over grievance procedure arose.

▶ **Union Position**—ALPA wants to keep the current grievance machinery, which provides that a pilot cited for disciplining or dismissal may make a written request to the company for an investigation and hearing. The proposed new machinery provides that all grievances, before going to higher levels, must be discussed with the flight manager who would make a decision within three days after the discussion.

ALPA expressed fear that the discussions with the flight manager might be prolonged for weeks while the company built up a case against the pilot. The Association passed a resolution that "the standard grievance section contained in all contracts be retained unchanged in the UAL pact."

▶ **Letter to Pilots**—Patterson, in a long letter to each of the UAL pilots, said all he asked was that grievances be settled at the first level of supervision and as quickly as possible. He declared a strike was being threatened on an issue that 99 percent of all unions actually demand in their contracts.

"When you cast your strike vote, you may be deciding the future of this company," Patterson emphasized. "A strike would reduce United's personnel to a skeleton organization with only a few hundred remaining of our 10,000 employes. Our situation would be similar to that of TWA (a year ago). The grounding of their Constellations and a strike ruined them. My position should be made clear: I cannot concede to the demand that a grievance procedure be eliminated from this contract."

The UAL development came as the National Mediation Board continued efforts to settle a dispute between ALPA and National Airlines (AVIATION WEEK, Nov. 24). Grievance at issue is NAL's refusal to reinstate a pilot whose Lockheed Lodestar was washed out when it skidded off a wet runway into the water at Tampa, Fla., on Sept. 13, 1945.

Brewster Names Aides For Congressional Group

Chairman Owen Brewster (R., Me.) of the Joint Congressional Air Policy Committee has designated four subcommittee staff advisors.

• **Col. Melvin Maas**, former Republican congressman from Minnesota, is serving as advisor to the subcommittee on combat aviation, headed by Rep. Carl Hinshaw (R., Calif.). Maas, formerly ranking Republican on the House Naval Affairs Committee, served as a Marine aviator during both World Wars.

• **Edward Sweeney**, law professor of Northwestern University, has been appointed advisor to the subcommittee on government organization, headed by Sen. Homer Capehart (R., Ind). Sweeney has served as counsel for the CAB, advisor on air law to ICAO, and special legal advisor to the President's Air Policy Commission.

• **William Westlake**, assistant executive director of the joint committee, is acting as staff advisor to the transportation subcommittee, headed by Sen. Owen Brewster (R., Me.).

• **Hal Davis**, clerk of the interstate and foreign commerce committee, is serving as staff advisor to the manufacturing subcommittee, headed by Sen. Albert Hawkes (R., N. J.).

Friedlander Leaves As Aeronca President

Aeronca Aircraft Corp. board of directors has accepted the resignation of John W. Friedlander as president. Friedlander had been president since June 1944 when he succeeded his brother, Carl, who has since left the company. The resignation, presumably indicates a major change in management, of one of the oldest and best known light plane companies. The Friedlanders had occupied top management jobs in the company since its early days in Cincinnati at Lunken Airport before it moved to its present site at Middletown, Ohio. First Aeronca was built in 1928 from a power glider design developed by Jean Roche, Wright Field aeronautical engineer.

Under John Friedlander's leadership, Aeronca was a major producer of lightplanes in the immediate postwar boom, running a close race with Piper for first production honors. Slackening demand for all lightplanes left Aeronca seriously overextended in inventory of planes, parts and materials.

Sidney F. Brody and Elmer L. Sutherland, vice presidents; Floyd Simmen, sales manager, and Ray Hermes, chief engineer, are remaining top management personnel. Aeronca board gave no immediate indication as to Friedlander's successor.

Aeronca is currently manufacturing tandem and side by side two-place personal planes, and Army liaison planes, and has in development a four-placer powered with the new 145 hp. Continental engine. The company apparently has abandoned plans for early production of the experimental two-place all-metal two-control Chum personal plane.

Brazilian Pact

The Brazilian government has signed five-year agreements with Servicos Aereos Cruzeiro Do Sul and Aerovias Brasil designating them as the two flag carriers authorized to fly to the U. S. The former plans one flight weekly to New York using DC-4s. Aerovias Brasil is to fly twice weekly to New Orleans, although its temporary terminal will be Miami. It will use DC-3s.

Brewster, Clark Shy From Hughes Probe

Evidence indicating that Maine's Republican Sen. Owen Brewster and Attorney General Tom Clark are equally eager to call off an investigation of charges, made last summer by TWA-owner Howard Hughes, that Brewster attempted to "blackmail" Hughes into merging TWA with Pan American Airways was spread on the record last week.

Justice Department released four memoranda relating to the probe. Hughes alleged the Maine Senator used threat of an investigation into his wartime flying boat and reconnaissance plane contracts to force the merger.

▶ **Brewster's Welcome**—First memorandum, released to the press by Brewster last Aug. 1, recalled Brewster's "welcome" of a "most thorough exploration" of Hughes' charges. "If there were a word of truth in the charges now being made by Howard Hughes," the Brewster statement declared, "they should have been presented to the Attorney General last February at the time of the alleged proposal. One does not wait six months where a blackmail charge is involved. I will welcome and invite the most thorough exploration of this charge by the Attorney General in justice to all concerned."

Second, a letter of Oct. 13 to Brewster from Irving Kaufman, Clark's special assistant, refers to approaches by Brewster to Justice "concerning your (Brewster's) desire to withdraw your request for an exploration by the Department of Justice of Howard Hughes' charges against you." Kaufman assured Brewster that his request for a withdrawal of his previous request for a Justice investigation would be acted upon expeditiously by Clark.

▶ **Startling Memo**—Third memorandum makes the startling and precedent-setting disclosure that unless the accused—namely, Sen. Brewster—approves, Justice will withhold its investigation of him. In a letter to Brewster of Oct. 21, Kaufman states that "the privilege of withdrawing is yours" and that if Brewster, in writing, were to withdraw his request for an investigation, "the exploration requested by you will not be undertaken."

Fourth communication is a letter of Oct. 29 from Brewster to the Attorney General in which Brewster accepted Kaufman's invitation to call off the investigation. Brewster stated that Hughes had threatened to request a Justice Department investigation and that he, Brewster, had merely announced that he would "welcome and invite an exploration"—were it requested. "If you do receive charges and if you desire to investigate those charges," Brewster wrote, "I would invite their most thorough exploration." Since Hughes has given no indication that he will at this time request Justice to investigate his "blackmail" charge against Brewster, this appears to be the finis signal in the TWA-PAA tiff between Hughes and Brewster.

Badgering of the Justice Department by Washington reporters, may prevent the tiff from being so nonchalantly written off. Justice Department is being questioned concerning the propriety of its action in calling off an investigation at the request of the subject of the investigation.

Aircraft Wages

Average weekly earnings by workers employed in the production of aircraft engines reached $58.71 during September, a rise of $2.13 over August, according to the U. S. Bureau of Labor Statistics. At the same time, average hourly earnings rose 1.5 cents to almost $1.46, and one hour was added to the average hours worked in a week, bringing it to forty hours and 18 minutes.

Other aircraft and aircraft parts production, however, showed a drop in weekly hours which was reflected in lower weekly earnings, although hourly earnings rose just slightly. Weekly hours averaged 39 hours and 12 minutes during September, a drop of 48 minutes below the August average of exactly 40 hours. As a result, weekly earnings fell to an average of $54, compared with $55.30 the preceding month. Meanwhile, average hourly earnings edged upward less than half a cent to $1.38½.

Four Bills Plug Need For Balloting Airpower

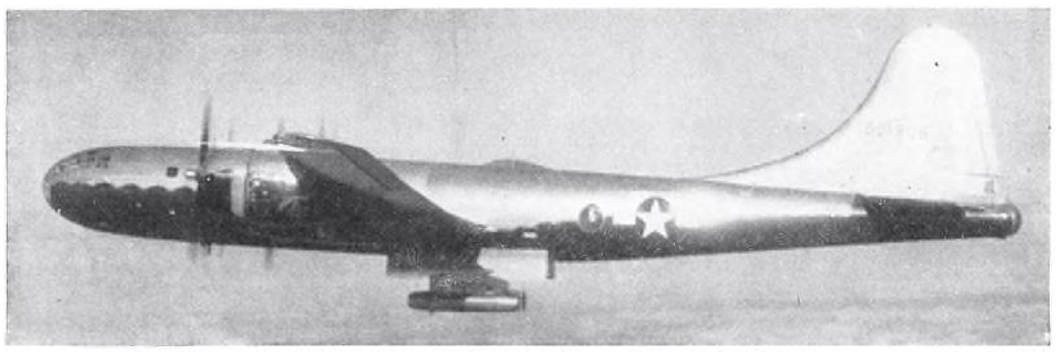
Four measures to strengthen U. S. military air power were introduced in House last week.

• **$5,000,000,000 expenditure** annually on aviation procurement is authorized in a bill proposed by Rep. Abe Goff (R., Ida.).

• **Supplemental 1948** fiscal year appropriation of $250 million for Naval Aircraft procurement and $430 million for military aircraft procurement is provided in a measure introduced by Rep. Henry Larcade (D., La.).

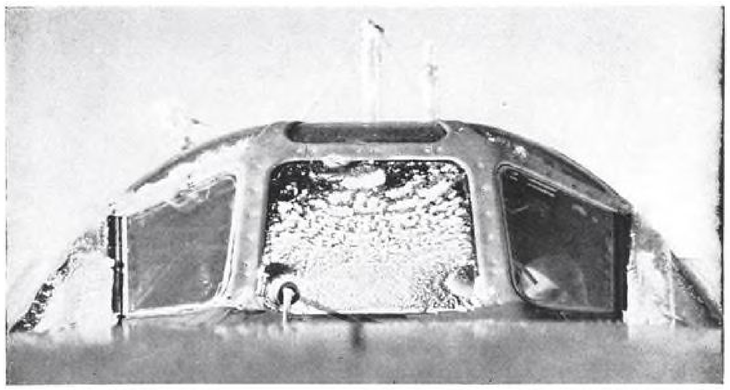
• **Establishment of a U. S. Air Academy** at Randolph Field, Tex., is authorized in legislation by Rep. Paul Kilday, (D., Tex.).

• **Re-evaluation of the strategic need** for overseas U. S. posts, stations and bases is directed in a bill offered by Rep. Sterling Cole (R., N. J.).



RAMJET FLYING TEST STAND

First photo of ramjet flight test shows NACA 20 in. design mounted on retractable support under B-29 belly. Although the ramjet engine is designed for operation at supersonic speed, these 300 m.p.h. tests determine thermodynamic data and the effect of altitudes up to 40,000 ft. In secret operation for more than a year, this flying test stand is used for a variety of jet engine tests at NACA Flight Propulsion Research Laboratory, Cleveland, Ohio. (NACA photo)



Windshield ice protection, as shown above in photo contrasting unprotected panel with heated panels at either side, won him recognition.

NACA Engineer Gets Collier Trophy for Thermal De-Icing

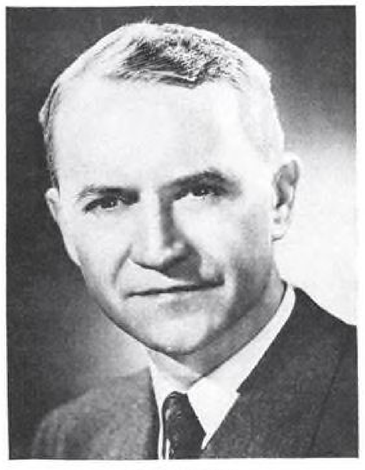
Lewis Rodert to receive award from President Truman; Curtiss-Wright engineers get honorable mention for work with reversible pitch props.

Lewis A. Rodert, research scientist of the National Advisory Committee for Aeronautics, will receive the 1946 Robert J. Collier Trophy "for his pioneering research and guidance in the development and practical application of a thermal ice-prevention system for aircraft." President Truman will present the trophy Dec. 17 at the White House.

The award, given annually for "the greatest achievement in aviation in America, the value of which has been demonstrated by actual use during the preceding year," culminates a decade of intensive research and development work on a variety of thermal ice-prevention systems under Rodert's direction.

► **Program Scope**—Scope of the program is indicated by the fact that all three NACA laboratories together with flight tests spanning the nation were utilized. Ultimate test of the system came last winter when a special Curtiss Commando transport, equipped with latest NACA icing instrumentation, sought out icing conditions throughout the Northwest and flew safely through some of the worst weather in history.

Under Rodert's direction, NACA laboratories have developed a complete anti-icing system for aircraft which substantially eliminates this menace as a threat to flight. In addition to the "hot wing" system, which utilizes exhaust heat conducted through the wing and tail leading edges, heated windshields, propeller blades, engine air intake ducts and carburetor air supply systems have been developed. These systems found wide application on war-



Lewis Rodert

time combat aircraft in experimental form and one or more of these features are to be found on all postwar combat and multi-engine transport aircraft already flying or in the design stage.

► **Flight Research Chief**—Rodert was born in Kansas City, Missouri, and received his engineering education at the University of Minnesota. He joined the NACA in September, 1936 and is presently chief of flight research at the NACA Flight Propulsion Research Laboratory, Cleveland, Ohio.

Three engineers of the propeller division, Curtiss-Wright Corporation were voted honorable mention by the National Aeronautics Association Collier Trophy award committee for their development of reversible pitch propellers for ground maneuvering of large aircraft. Reversible propellers are standard equipment on all four-engined aircraft now under development.

AIA Names Leland Webb As Third Vice-President

Election of two new industry vice presidents and advancement of the Aircraft Industries Association west coast managers to a third vice presidency in the association were actions in the election meeting of the AIA board of governors, at Hollywood, Calif. recently.

William M. Allen, Boeing Aircraft Co. president, and J. Carlton Ward, Fairchild Engine and Airplane Corp. president, were elected vice presidents, succeeding T. Claude Ryan, and H. M. Horner, presidents respectively of Ryan Aeronautical Co., and United Aircraft Corp. Ward was elected to the executive committee succeeding Ryan. Leland D. Webb, western regional AIA manager, was made a vice president.

Following custom, the new chairman of the Personal Aircraft Council of AIA, Dwane Wallace, president of Cessna Aircraft Corp., was elected to the AIA board of governors.

Maj. Gen. Oliver P. Echols, (Ret.) continues as president; Eugene E. Wilson, vice chairman of United Aircraft Corp., as board chairman, and Harrison Brand, Jr., as secretary-treasurer.

AIA directors include: Wilson, Echols, Wallace, Allen, Ward, Ryan, Horner, and E. B. Newill, general manager, Allison division General Motors Corp.; Victor Emanuel, chairman, Avco Manufacturing Corp.; Lawrence D. Bell, president, Bell Aircraft Corp.; Malcolm P. Ferguson, president, Bendix Aviation Corp.; Harry Woodhead, president, Consolidated Vultee Aircraft Corp.; Guy W. Vaughan, president, Curtiss-Wright Corp.; Donald W. Douglas, president, Douglas Aircraft Co., Inc.; Robert E. Gross, president, Lockheed Aircraft Corp.; Harry T. Rowland, executive vice president, Glenn L. Martin Co.; J. H. Kindelberger, president, North American Aviation, Inc.; Richard W. Millar, chairman, Northrop Aircraft Inc.; Mundy I. Peale, president, Republic Aviation Corp., and R. E. Gillmor, vice president, Sperry Corp.

Pickup Planes Grounded

All American Aviation grounded its two remaining Beech D18C pickup planes this month pending investigation of an accident involving a third craft near Wellsburg, W. Va. The crash, which may have been caused by structural failure, occurred after an in-flight mail pickup.

Newspaper Shipments

Subcommittees of the House Foreign Affairs Committee and the Senate Foreign Relations Committee are now weighing a proposal to "sell" America to Europe through large-scale shipments of U. S. metropolitan newspapers to the continent daily by air.

The subcommittees, headed by Sen. Alexander Smith (R., N. J.) and Rep. Karl Mundt (R., S. Dak.), are considering the so-called "Voice of America" bill—legislation designed to counteract Russian propaganda on the continent with a U. S. program.

The proposal to include air-transported newspapers in the U. S.'s overseas propaganda program, a step which would furnish north Atlantic carriers a sizable daily cargo, was pushed last week by Sen. Alexander Wiley (R., Wis.) in a speech on the Senate floor. Terming newspapers "the best organs of publicity about America", Wiley urged that shipments of metropolitan papers be dispatched daily by air to all U. S. ambassadors, ministers, consuls, and other officials in Europe, as well as all leading European hotels. Just returned from a survey trip to Europe, Wiley objected that newspapers are now sea-shipped and it is virtually impossible to obtain recent issues on the continent.

UAL Cuts Personnel

United Air Lines has been forced to lay off about 1,100 employes, largely traffic and passenger service personnel, as a result of the DC-6 grounding. Mechanical and maintenance workers have been least affected by the cuts. All employes with more than 6 months service will be rehired when DC-6s are returned to operation.

AVIATION CALENDAR

Dec. 17. Annual Wright Brothers Lecture, U. S. Chamber of Commerce Building, Washington.

Jan. 7. Florida Flying Alligator Club international meeting, Melbourne, Fla.

Jan. 7-30. Air Transportation Institute, American University, Washington, D. C.

Jan. 9-11. All-American air maneuvers, Miami.

Jan. 13. ICAO statistics division, Montreal.

Jan. 15-18. Southeastern soaring contest, Sanford, Florida.

Jan. 26-28. CAA non-scheduled operators of region four, Fort Worth.

Mar. 8. ICAO maps and charts division, Brussels.

Mar. 22. ICAO aeronautical maps and charts division, Brussels.

Mar. 26. National Flight Propulsion meeting, Institute of the Aeronautical Sciences, Hotel Carter, Cleveland.

Apr. 4-8. American Association of Airport Executives, Congress Hotel, Chicago.

June. Second ICAO assembly meeting, western Europe.

INDUSTRY OBSERVER

► **Next year's National Air Races is expected to bring the first entry of foreign jet planes. U. S. military services have not yet indicated that they will participate in the 1948 Cleveland jet events, but it is not likely that they will stay out and let the foreign jets take top speed honors.**

► Beech Aircraft's new optional all-over paint job on the four-place Bonanza, adds 8½ lb. to weight of the plane, costs an extra $275 when ordered with the plane.

► **Ryan Aeronautical Corp. is in line for an additional Navion liaison plane contract from Army Ground Forces, continuing the contract originally given to North American Aviation, Inc. last year for off-the-shelf Navion purchases.**

► Investigators of the Convaircar flying auto crash, reported that the "fluffy" edges of the shattered laminated glass plastic body, were a principal reason for the escape of pilot and engineering observer with minor injuries. Sharp edges of a metal-skinned body in a comparable crash would have caused much more serious injury, they believed.

► **Gen. George C. Kenney, Strategic Air commander, says that the Air Force needs a paint for fighters that won't crack. "We gain 15 mph. on a jet fighter by a smooth paint job over the normal polished aluminum surface, but when continual flexing of the wings puts a few cracks in the paint, we lose 25 mph.," he said.**

► Howard Hughes received from CAA type certificate No. 1451 for his Hughes radar warning indicator. His factory at Culver City, Calif., is producing the certificated units at the rate of 50 to 75 a week to fill orders from airlines which have until Feb. 15 to install, under CAB order, an approved type radar obstruction indicator, of which several are on the market. The Hughes unit, identified as HTS-13A (Hughes Terrain Radar), now gives light-bell warning at 500, 1,000 and 2,000 ft. Cost of entire project to Hughes is $340,350. The 24 volt system will sell to airlines at $154.05 per unit with a price tag of $218.55 per unit for the 12-volt system.

► **New French turboprop unit, the G.C.A. Ibis, is rated at 3,285 horsepower. It was designed and built by the Electromechanical Co. at Lyons. It will be tested on the outboard engine installation of the Block 161 Languedoc transport.**

► A. V. Roe Canada's turbojet engine has been named the Chinook and will develop 2,590 lb. of static thrust. It is an axial-flow design 32 in. in diameter and weighs 1,250 lb.

► **Air Force is interested in the Navy McDonnell Phantom FH-1 jet fighter as a transition trainer for its own highspeed jet fighters. Design studies of a two-seat version are now being examined to determine the practicability of the idea. Phantom's relatively low landing speed—about 80 mph.—is its chief attraction as a jet trainer.**

► Navy has revealed that the Douglas D-558-1 design was never intended to reach sonic speed, contrary to many published reports. It was designed specifically only for a mach number of 0.85, which the airplane has already reached on numerous occasions.

► **Fairchild Airplane & Engine Co. is now test flying its third model four-place personal plane at Winfield, Kans. First plane crashed during spin tests when spin chutes failed to open. Second model was broken up in static tests.**

► Aeronca is planning to introduce folding wings on its four-place model. Just where the folding wing models will begin on the assembly line has not yet been determined but the break is expected before more than 200 conventional models have been made.

► **Design and construction of an experimental magnesium wing for the Lockheed P-80 Shooting Star is now under way at Air Materiel Command, Wright Field. The wing is expected to weigh no more than conventional aluminum alloy but offers simplified construction, smooth exterior and additional unobstructed internal area for fuel stowage.**

► Curtiss XP-87 arrived at Muroc Air Base after truck trip across nation. Preliminary ground runup and taxi tests will continue this year with first flight scheduled around Jan. 10, 1948.

AVIATION WORLD NEWS

Non-Skeds Increase Shannon Operations

The non-scheduled airlines are operating in and out of Shannon Airport, Ireland, on a constantly increasing scale. Compared to the major airlines their flight statistics seem small. However, looking at it from a growth point of view, the record becomes impressive.

Latest figures from the airport controller's office show that in the period, August and September, the movements of non-scheduled carriers more than doubled over the preceding three-month period. Specifically, there were 278 operations in the former two-month period, while there were but 136 in the latter period.

By comparison the regularly scheduled airlines noted 2470 flights in the August, September period, and 3112 flights in the preceding three-month period.

What's more the operations officials at the airport (which is owned and operated by the Irish government) have come to look upon the onetime pariahs of commercial aviation with a healthy respect.

Jonathan P. Saul, the operations officer (and navigator for Kingsford-Smith in the Pacific flights of the Southern Cross) says that the ex-G.I.'s who for the most part are both operating and piloting the non-scheduled lines are "well up on their jobs" and generally operating and maintaining their aircraft efficiently.

Their aircraft, mostly surplus DC-4's, he reports, are always "shiney on the outside," clean inside, and their engines in the best possible condition of maintenance. He added that their navigation is as good as that of the scheduled carriers.

Non-scheduled lines listed as among the most frequent callers at Shannon at the present time are Transocean, Trans Caribbean, Flying Tigers, Willis, Pacific Overseas, Seaboard and Western, Ocean Air Tradeways, and Waterman.

Greatest contender of all of them, at Shannon, for the trans-Atlantic traffic, is Transocean, which maintains an office at the airport and with 6 DC-4's is averaging 12 roundtrips a week between the U. S., Ireland, England, and Belgium.

Transocean's biggest plum is its subcontract with Trans Canada Airways for taking English emigrees to Canada. Since August 1 it has flown 3,600 emigrees to Toronto.

Rio Letter:

Competition Keen In Brazil

RIO DE JANEIRO—Brazilian airlines are slugging it out to get passengers.

The general manager of one line, who wanted to fly to Rio the other day from another Brazilian city, asked this hotel porter to get a ticket on his line—but without mentioning who he was.

"That plane is filled up," the porter said, "but I can get you a seat on the X plane."

The airline official went around to the office of his own company, found there was only a small booking and arranged for a seat.

Then he went back to the hotel and told the porter:

"I got a seat on the plane I wanted, and for your information I'm the general manager of that line. Why did you tell me the plane was full?"

There was nothing for the porter to do but 'fess up. He said:

"Well, I don't make much salary here, you see, but that line that I suggested pays me very well."

* * *

Although that particular effort went sour, it's a sample of the rate-cutting tactics. Another trick is to sell a one-way ticket with the round-trip discount. And sometimes the price comes down just by haggling.

One top airline executive told me:

"The price from Rio to São Paulo is 324 cruzeiros, but I'm willing to bet that if you went to the Z company and offered 150 cruzeiros they'd take you."

* * *

The Rio-São Paulo run is, of course, the most lucrative in Brazil. Those are the country's two large cities—Rio with around 2,000,000 population, São Paulo with not so many less—and they are only about 200 miles apart.

All the scheduled airlines in Brazil (Panair do Brasil, Cruzeiro do Sul, Aérovias Brasil, Varig, V.A.S.P., R.E.A.L., L.A.B. and N.A.B.) make that run daily and some of them several times daily. In addition, a dozen or so unscheduled lines make the flight frequently, mostly to carry cargo. With many private and military aircraft also using the Santos Dumont field at Rio, that airport is buzzing, though the stacking-up which has become so serious in the U. S. is not yet a major problem here.

* * *

It has become a cliche to say that Brazil is air-minded. With only about 22,000 miles of railroads and 170,000 miles of highway (much of it very bad), the country simply has to be air-minded.

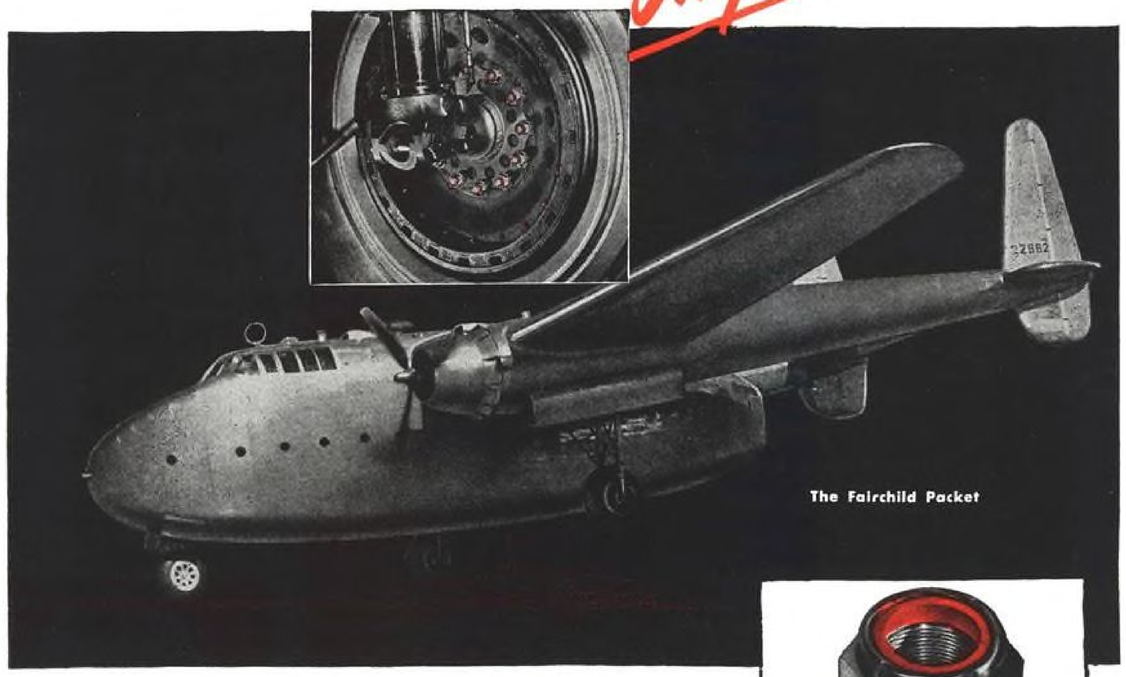
The airlines have blossomed gradually since a bunch of rootin'-tootin' American pilots set up the Nyrba line in 1929 just in time to beat out Pan American Airways and thus practically oblige Pan Am to buy them out.

As a matter of fact, Varig, which was then all mixed up with the Germans, has been in the air since 1927, but in those days it was a local operation in the southern state of Rio Grande do Sul.

Pan American, and subsequently its affiliate Panair do Brasil, had almost undisputed dominance of the air over most of Brazil until the Second World War, when several other local companies appeared. Most important is Cruzeiro do Sul, which used to be the old German Condor line but is now strictly Brazilian. Today it's a toss-up whether, at any given moment, Ponair do Brasil or Cruzeiro has more service inside Brazil. If Panair do Brasil's foreign services are taken into account—including the expansion in November of her European lines to Istanbul—then Panair do Brasil is the most extensive Brazilian airline. Cruzeiro has just gotten U. S. and Brazilian government permission to fly once weekly to New York, but hasn't yet worked out the problem of intermediate stops. Panair meanwhile has pioneered a non-stop line from Tio to Lima, by Constellations, and awaits Brazilian-Peruvian governmental agreements to begin operations.

—Henry W. Bagley

DAMPENING THE *Landing Impact* STRESSES



—with the Red Elastic Collar that protects permanently against Thread Failure

Thread damage—caused by landing impact stresses set up by the 45,000 pound Fairchild C-82 "flying boxcar" made every bolted connection on the tricycle landing gear a critically important fastener application. Prestressed settings had to be maintained against flight vibration. Full thread contact had to be provided to dampen the shock and prevent metal fatigue. Here again, ESNA Elastic Stop Nuts provided the permanent protection that has made them symbols of security to all aviation engineers. ESNA Elastic Stop Nuts are self-locking, easily removable, and reusable over and over. They protect permanently against Vibration, Corrosion, Thread Damage, Liquid Seepage and Costly Maintenance.

If fastening problems slow up your production or increase your maintenance costs, let us place the results of our experience and research at your disposal now.

Address: Elastic Stop Nut Corporation of America, Union, New Jersey. Representatives and Agents in many principal cities.

The RED ELASTIC COLLAR

— denoting an ESNA product —

. . . is threadless and permanently elastic. Every bolt — *regardless of commercial tolerances* — impresses (does not cut) its full thread contact in the Red Elastic Collar to fully grip the bolt threads. In addition, this threading action properly seats the metal threads — and eliminates all axial play between bolt and nut threads.

As a result, the Red Elastic Collar acts as a shock absorber. It dampens impact stresses — and materially reduces the shock against the metal threads that causes thread failure in conventional fasteners.

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PRODUCTS OF: ELASTIC STOP NUT CORPORATION OF AMERICA

Wright Monument, Devil Hill, Kitty Hawk, N. C. Ordered by Act of Congress. Dedicated Nov. 1932. Beacon-lighted. Legend reads . . . "In Commemoration of the Conquest of the Air by the Brothers Wilbur and Orville Wright, Conceived by Genius, Achieved by Dauntless Resolution and Unconquerable Faith."

A monument to "taking pains"

• Rising sixty-one feet above Kill Devil Hill at Kitty Hawk, N. C. is a monument that enduringly commemorates an airplane flight that endured only 59 seconds.

• It was the world's first successful powered flight; the flight that got man off to the conquest of the air. It was made possible by the genius of the Wright Brothers . . . plus "the infinite capacity for taking pains" that genius must have to accomplish its mighty ends.

• From the Wright Brothers . . . and from that other great pioneer of heavier-than-air flying, Glenn H. Curtiss . . . Curtiss-Wright has inherited the tradition of long-range planning and the capacity for sticking to a job till it's done right.

• Out of this great heritage have come . . . and are still coming . . . airplanes, engines and propellers bearing the dependable stamp of Curtiss-Wright design . . . bringing closer the day when the sky will be every man's thoroughfare.

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Marquette Metal Products Company
Victor Animatograph Corporation

December 17th Marks the 44th Anniversary of the Kitty Hawk Flight

Texas Co. Building Laboratory To Develop Jet Engine Fuels

More than 800 employees to be engaged in testing and evaluating jet fuels under actual flight conditions

To keep pace with the rapid progress in modern aircraft power plant design, The Texas Co. is finishing construction of new laboratory facilities at Beacon N. Y. for the development of better combinations of jet fuels and engines.

Wholly financed with company funds, the facilities are scheduled to begin complete operations in January with combined personnel numbering more than 800, and is intended to make possible the evaluation of jet fuels under actual flight conditions. Initially, the facilities will be used to evaluate fuels in turboprop and turbojet combustors, but it will be possible to adapt to ramjet studies as well.

Nucleus of the lab was started back in 1931. In early 1944, fuels were sent to various engine manufacturers for test runs. This very early work with equipment makers was conducted in lieu of establishment of complete lab. facilities by Texaco, because it was felt that equipment in such a lab would soon be obsolete in the light of the tempo of initial development.

▶ **Make Own Studies**—Now, feeling that design progress has stabilized, Texaco is ready to conduct investigation wholly on its own. No contracts with any government agency has been assumed, but it is deemed likely that such activity will be undertaken.

Texaco's new facilities are represented as being more versatile than any other comparable fuel lab now operating. With a capability of conducting studies covering a range up to 60,000 ft. of altitude, the lab includes tremendous air-pumping capacity and will permit tests on any full scale engines now available. Possible is flow through a 5-in. dia. test section at Mach 3.5 (about 2,500 mph.). The General Electric TG-180 and the Westinghouse 24C have already been utilized for fuel studies in the lab.

In keeping with its early activity of working with equipment manufacturers, Texaco will continue to collaborate with engineers of the various engine makers on design problems uncovered in the course of its fuel research.

▶ **Range of Research**—One phase of the lab studies will be concerned with the effect of hydrocarbon molecular structure, weight, and addition agents on performance. Also investigated will be effect of flame and ignition acceleration, inlet pressures, air temperatures, and velocity of fuel flow.

Since turbojets, ramjets, and pulse jets are susceptible to "blowout" under certain operating conditions, study of flame stability will be a major factor in basic performance requirements of jet fuels. Clean burning of fuel is considered the next important study, so as to avoid carbon deposits, since hard carbon formations result in loss of efficiency, uneven heat dissipation, warping and distortion of burners, and corrosion. Also high on the list of jet fuel requirements is high heat content per unit volume, for good operating range, and the factor of low freezing point.

▶ **Petroleum Satisfactory**—It has been found that petroleum fuels fulfill these requirements very satisfactorily, and presently, interest is centered mainly on them. However, it is felt that in some applications a departure will be necessary to occasion the use of combination petroleum fuels and other products. Materials considered include fluorine compounds, alcohols, and boron

CONVAIR'S NEW BOARD OF DIRECTORS

New board of directors of Convair are: (left to right) V. C. Schorlemmer, Convair vice president of finance; Joseph H. Rosenberg, Los Angeles manager for Lehman Bros., N. Y. investment bankers; Louis A. Johnson, Convair controller; Donald N. McDonnell, Los Angeles manager for Blyth & Co., securities brokers; Richard C. Patterson, Jr., (representing Atlas), chairman of Ogden Corp. and director of General Aniline & Film Corp.; George H. Shaw, (Atlas), Denver attorney and a director of Radio-Keith-Orpheum Corp.; C. E. Groesbeck (Atlas), director and consultant of Electric Bond & Share Co.; board chairman and Atlas chief Floyd B. Odlum; Sydney R. Inch, (Atlas), vice chairman of board and a director of Ebasco Services, Inc., N. Y.; Oswald L. Johnston, (Atlas), N. Y. attorney; Convair President Harry Woodhead; I. M. Laddon, Convair executive vice president; Ben O. Howard, (Atlas), aviation consultant; William C. Rockefeller, (Atlas), aviation consultant; and Emmett A. McCabe, Atlas Corp. executive and public relations policy-maker for new Convair board. Two board members were absent when photo was taken: William A. Blees, Convair vice president of sales; and John Hertz, of Yellow Cab and Hertz Driv-Ur-Self System prominence.

hydrides. Special inorganic compounds are being studied for ramjet applications in an attempt to obtain greater flame stability and increased heat content per pound.

It has been found that engine life depends to a very large extent on type of fuels used. As higher and higher operating temperatures are reached, metals, not fuels, will be the most critical factor. But thus far it is felt that fuels are fairly well abreast in importance with engine design, and warrant the concentrated study to be pursued at the new Texaco lab.—I.S.

I.A.S. Completes Part Of Indexing Program

First phase in the development of the Standard Aeronautical Index, being prepared by the institute of the Aeronautical Sciences for the Air Documents Division, Intelligence T-2, Air Materiel Command, Wright Field, Ohio, has been completed.

This part of the job was the functional breakdown into major divisions of the entire field of aeronautics based on a survey of several thousand specialists in the field and contacts with nearly 1,500 experts in aviation. The resulting concensus yielded a list of 47 divisions.

Purpose of the Index is to create a vehicle for the selective, high speed dissemination to accredited contractors of abstracts of both security classified and non-classified technical reports and papers to facilitate research and development—"to guard the nation against technological surprise." The program is part of the broad mission of Intelligence T-2, Air Materiel Command, and is directed by Col. H. M. McCoy, chief of intelligence T-2; Lt. Col. Albert A. Arnhym, chief, Air Documents Division; and Capt. N. A. Draim, chief, Technical Data Division, Bureau of Aeronautics of the Navy.

Its mass production methods in the processing of documents and extensive use of business machines for efficient and accurate operations conform with the announced policies of AMC to introduce greater efficiency in military organizations by use of modern methods.

The program of the A.D.D. will save Air Force and Navy contractors an estimated $72,000,000 annually in the performance of their work.

Attending the finalization conference on the first phase of the Standard Aeronautical Index were (l. to r.) Harris Reeve, technical assistant, S.A.I.; Max Sokol, project engineer, S.A.I.; Leslie Neville, director, S.A.I. and former editor of AVIATION; Elizabeth Brown, librarian, S.A.I.; Captain N. A. Draim, chief, Technical Data Division, Bureau of Aeronautics; Lt. Col. Albert A. Arnhym, chief, Air Documents Division, Air Materiel Command; Ruland M. Woodham, administrator, S.A.I.; Keith G. Brown, chief librarian, S.A.I.

BRIEFING PRODUCTION NEWS

► **Republic Aviation Corp.** has reached a rate of better than one per day on production of P-84s. Contract is expected to last about two years.

► **Boeing Wichita** division expects to reach an employment peak between 1,900 and 2,000 by February as the result of additional sub-contract work on the Stratocruiser and B-50. Present employment is about 1,350.

► **Beech Aircraft Corp.** has completed approximately two-thirds of its contract for the overhaul and modification of 150 twin-engine training planes for the Navy (SNBs and JRBs).

► **Jack & Heintz Precision Industries, Inc.** set a company record for ball bearing production with an October output of 511,907. This is more than double the bearing production of seven months ago. Installation of a new heat treat furnace is expected to push the future output higher.

► **Texas Engineering and Manufacturing Co.** has received new orders aggregating more than $500,000 from foreign governments and airlines for overhaul and conversion. TEMCO will supply and convert four C-47s for Orient Airlines, Ltd., of India, is supplying aircraft parts to Venezulea, in addition to rehabilitating and overhauling three B-25s for that country, and is reconditioning a number of B-25, P-47, PV-1 and P-40 aircraft for Brazil.

► **Boeing Aircraft Co.** has completed 100 hours of flight time on its two test Stratocruisers. The first ship to fly has about 87 hours, and the second more than 13 hours. Company has begun fairly widespread subcontracting of sub-assemblies for both the Stratocruiser and the B-50 bomber. Among subcontractors are: Rohr Aircraft Corp., Northrop Aircraft Inc., Swallow Airplane Co., Wichita, Kans., Bendix Products division of Bendix Aviation Corp., and Cleveland Pneumatic Tool Co.

► **Niles-Bement-Pond Co.'s** Pratt & Whitney division has taken over manufacture of the products of Magnetic Gage Co., Akron, Ohio. Early next year, the operations now at Akron will be moved to West Hartford.

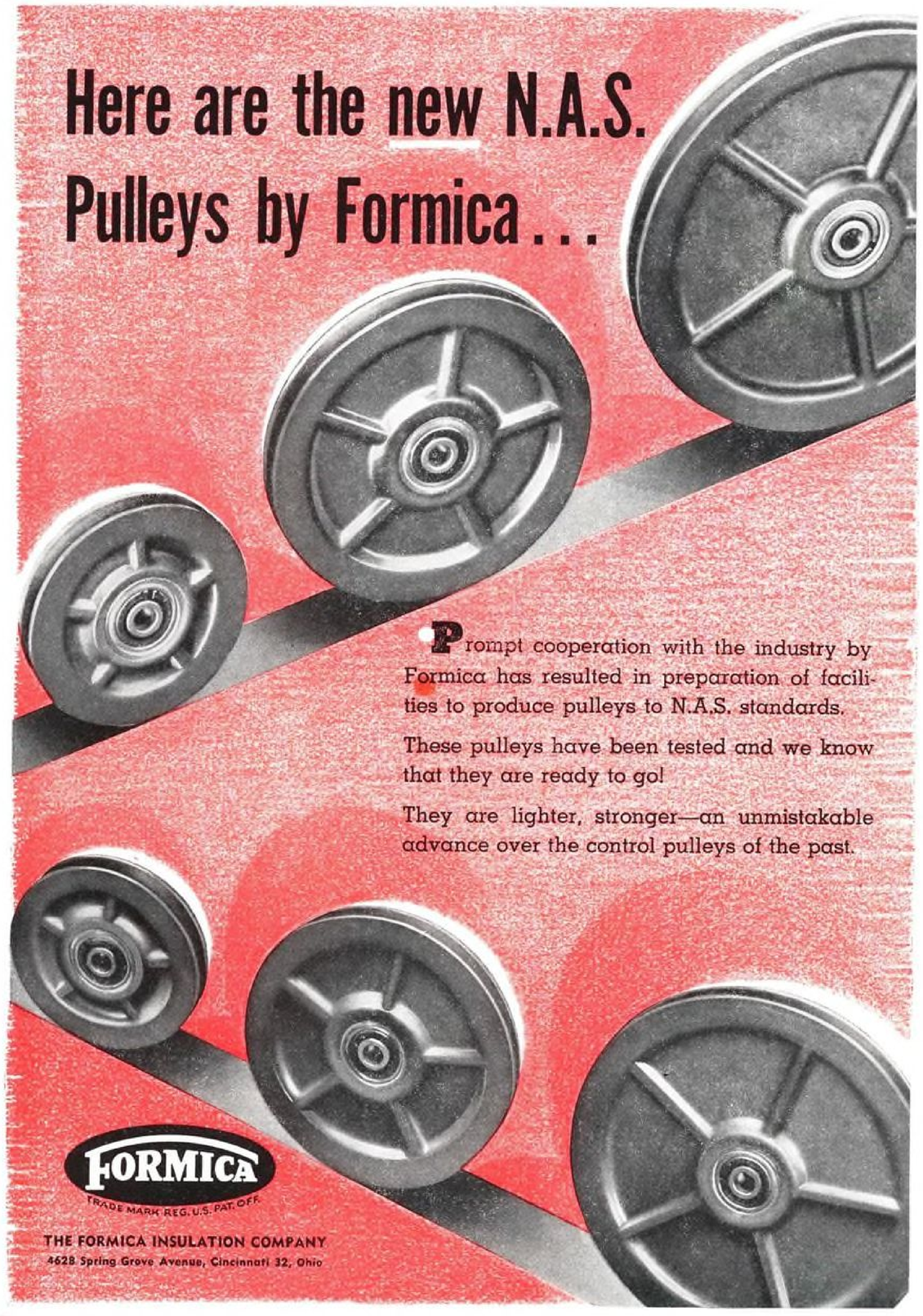
► **Lockheed Aircraft Service, Inc.** has signed a contract for major overhaul and modification of Scandinavian Airlines System's fleet of seven DC-4s, work to be done at the MacArthur Field base of LAS. Company has already completed 400-hr. and 800-hr. checks on SAS planes and has just initiated a 3,200-hr. check on the line's DC-4s.

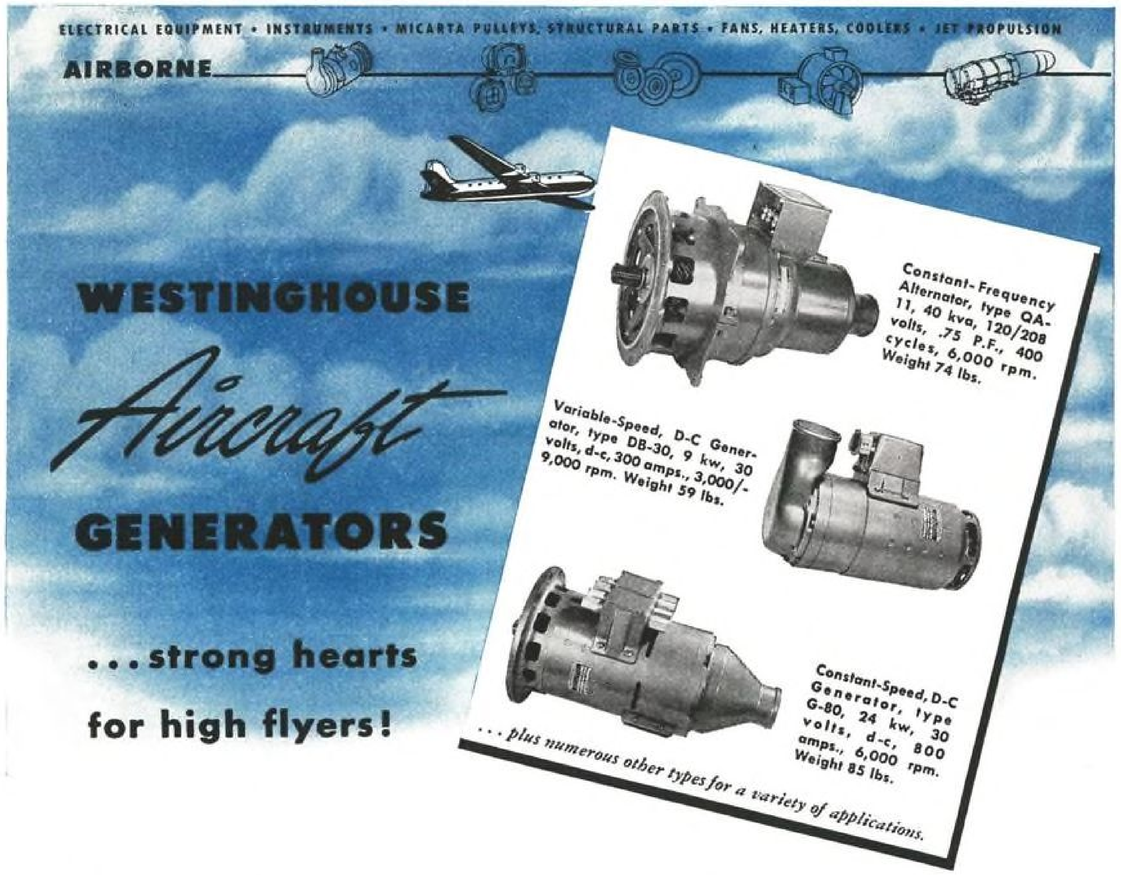
Unchallenged Ballots May Decide Martin Union Row

More than 600 challenged ballots, now being investigated by the National Labor Relations Board, may decide whether the C.I.O.'s United Automobile Workers will retain bargaining rights for 8,500 employees of Glenn L. Martin Co. at Middle River, Md.

NLRB has ordered investigation of 617 challenged ballots and objections to the Aug. 21 election filed by the company and the U.A.W.–C.I.O. This action was taken after the C.I.O. union complied with the non-Communist affidavit requirements of the Taft-Hartley Law. The International Association of Machinists (Ind.), which also participated in the election, already was in compliance.

Unless the challenged ballots give the U.A.W.–C.I.O. a clear majority, a run-off between the two unions may be necessary. The C.I.O., with 2,729 votes, needs 385 of the challenged votes to obtain a majority of the 6,227 votes cast. The I.A.M. obtained 1,916 votes. There were 965 votes for "no union."





The heart of the vital electrical system on modern aircraft . . . the generator . . . above all, must be dependable.

Small or large, d-c or a-c, low voltage or high voltage, Westinghouse generators have extra dependability. It is the result of more than 15 years' experience in building engine-mounted generators . . . wartime schedules that topped 6,000 generators a month . . . engineering and research that produced this unchallengeable record of generator "firsts" . . .

First to braze commutator connections on a production basis—greatest contribution ever made to generator dependability.

First halide-treated, high-altitude brushes—still the only answer for long brush life.

First quick-disconnect, precision-cast steel mounting flange with high critical frequency and with fatigue strength greater than that of any engine pad.

First to use chrome-silver-copper alloy commutator bars—twelve times the endurance of copper at 300° C.

First readily replaceable coupling combining a resilient synthetic member and a friction damper—amplification less than 3:1 at all frequencies.

First ventilated bearings, mounted in nitralloy bushings, and lubricated with extreme-temperature-range silicone grease.

First generator available with load-sensitive temperature indicator.

First true "wide speed range" . . . 3,000 to 9,000 rpm . . . 300-ampere generator below 60 pounds.

Generators are but a small part of the complete Westinghouse line of aviation products. For more information, ask for B-3775. Call your local Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-94767

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After ground aide has started helicopter swinging, it regains motionless hovering within three oscillations although pilots hands are off stick.

Hiller 'Copter Has Built-in Stability

Design now undergoing CAA tests as preliminary to production is based on new principle to make possible "hands-off" hovering.

By SCHOLER BANGS

United Helicopters, Inc., Palo Alto, Calif., early next year will begin commercial production of a 178 hp. three-passenger helicopter, and claim for it—complete, inherent stability.

An entirely new system of aerodynamic flight control appears to have won this major goal of the helicopter industry.

A production model now is in flight, undergoing C.A.A. certification tests, and specifications show an unusually high useful load of 37.6 percent of the 'copter's 2,100 lb. normal gross weight.

Stanley Hiller, Jr., its sponsor, says that it will be priced at between $12,500 and $20,000.

Basic stability of the design is such that after eight minutes of ground coaching this writer, with no prior helicopter piloting experience, was able to take off in a moderate breeze, hover, and land a one-place experimental model without difficulty.

In hovering flight, and trimmed, the machine can be flown "hands off" except for an occasional light touch of the control column to correct for wind gusts.

Frank Peterson, United Helicopters chief test pilot, demonstrates stability in hovering by allowing an aide to grasp a landing wheel and give the helicopter a violent pendulum swing while he sits with hands removed from the control column. Within three quickly diminishing oscillations the 'copter restores to its motionless hovering attitude.

Source of this stability is the combination of a universal mounting of the rotor head upon the power shaft, and the introduction of a small servo rotor between pilot and rotor to control the attitude of the main rotor.

► **Control Sequence**—A study of the accompanying close-up photo of the rotor assembly will disclose the following sequence of control:

The control stick, extending upward through a gland in the roof of the cabin, attaches to a universally mounted transfer bearing. From the part of the bearing that turns with the shaft two scissors extend upward and connect with short arms protruding down from the servo rotor arms, which attach directly to the rotor head.

Movement of the control stick tilts the transfer bearing and through the scissors introduces to the servo rotor paddles positive and negative pitch changes. Aerodynamic forces thus developed tilt the rotor head and produce the effect of cyclic pitch changes of the main rotor blades.

Tilt of the rotor head follows the tilt of the control transfer bearing in 1:1 ratio, and is limited to 10 deg. by mechanical restriction of transfer bearing movement.

Hiller explains that dampening action of the servo rotor system tends to maintain a stable position of the main rotors, and that this is augmented by universal mounting of the rotor head, which frees the main blades from tilt that otherwise would be caused by wind gusts striking and swinging the helicopter body.

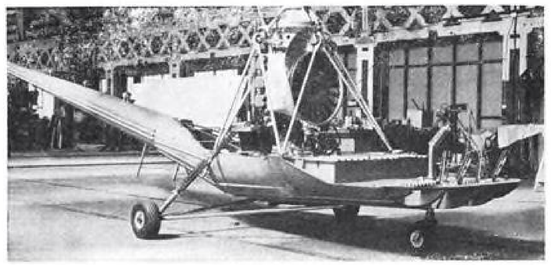
A phenomenon of the control system is that full tilt action of the rotor head does not develop until the rotor blades have moved through 180 deg. following first application of a position change through the control stick.

The system is distinctive in that there is no feed back of main rotor control forces to the control stick.

Were it not for a spring loading of the control stick at the point of its attachment to the transfer bearing assembly no force beyond that required to overcome bearing friction would be needed to effect changes in rotor tilt. The spring loading thus serves a dual purpose: centering the control stick to maintain hovering without pilot assistance; and giving the pilot a "feel" of control during maneuvers.

In the present production model of the Hiller 360 the spring loading of the control stick is such as to require a force of only 15 oz. to effect a change of position.

An interesting aspect of the overall control system is that while the helicopter responds quickly to a light, steady movement of the control stick



Basic structure of Hiller 360 is fabricated sheet metal "platform" carrying all load stresses and supporting non-stressed cabin and vertical engine mount. Engine and accessories and rotor assembly are supported with Lord mounts on quadrapod that attaches to platform with four bolts.

Test flight on third day out of shop shows configuration simplicity of United Helicopters, Inc. production model. Pilot and two passengers sit abreast in wide cabin. Aviation Week's Pacific Coast editor is studying instrument panel. Manufactured units will have doors in place and fairing over tail rotor drive shaft.

it is unresponsive to sudden, violent movements of the stick. The stick can be moved rapidly in straight lines or through complete circles without a perceptible rotor head reaction. Yet a finger-tip touch of the stick is all that is required to correct gust displacement of the helicopter from its line of flight.

► **Outgrowth of Past**—As has often been the case in mechanical improvements, the Hiller 360 control system may be cited as the resurrection of a nearly-forgotten early experiment.

In 1940 Hiller had made some drawings of rotor "paddles" that might be used for aerodynamic boost of main rotor controls.

A little over a year ago, during an engineering conference, they were brought into discussion by Joseph Stewart, head of testing for United Helicopters. Hiller recalls that their present application was worked out by Harold Sigler, chief design engineer, and himself, and Edward Bennett, in charge of special experimental construction, was assigned to build test units.

Ten days later a test ship was in flight, and results were such that the system was made the backbone of the present production model.

Hiller had foreseen for some time that his co-axial "Commuter" design would have to be abandoned in the interest of production economy. Although unique, and showing promise of reasonably good performance, its rotor assembly was too complicated to satisfy his objective of a design that could be produced with greatest economy.

He recalls that it required strong determination to put the coaxial project on the shelf and begin exploring a single main rotor design having the tail torque rotor which he had been able to eliminate with the coaxial design.

However, the single rotor design offered the possibility of developing a tilting rotor head and direct control assembly having only seven component parts; and he thought he could get away from the tail rotor by using a fan-blower jet exhaust tube to overcome main rotor torque. It worked, but at speeds above 40 mph. the jet torque control assembly consumed engine power to a prohibitive degree.

He went back, then, to tail rotor experiments with a design that left him dissatisfied with its conventionality and thoroughly concerned over unstable characteristics of the directly-controlled main rotor.

It was at this point that Joseph Stewart remembered Hiller's early "paddle" drawings.

Design of the 360 was begun almost immediately after flight tests of the servo rotor system were termed a success.

Into it went all that Hiller's company has learned about weight saving, design simplification, and "production-ability."

Results were immediate:

• **Replacement** of steel tube framework construction by a fabricated sheet metal structure that will be less costly and quicker to build on a production basis;

• **Elimination** of tail boom interior

SPECIFICATIONS

WEIGHTS

Normal gross	2100 lb.
Empty	1311 lb.
Useful load	789 lb.
Pilot, two passengers, 90 lb. baggage, 29 gal. fuel, 2 gal. oil.	

FUSELAGE

Construction	All-metal, semi-monocoque
Max. width	5' 2"
Max. length	37' 6"
Height to cabin top	5' 8"
Height to rotor	8' 8"

CABIN DIMENSIONS

Seat width	62"
Length, seat back to nose	55"
Height, floor to roof	50"

POWER PLANT

Type	Aircooled Motors, Inc. Model GU4-178-B32
Rated rpm.	3000
Rated power	178 hp.
Power loading, gross wt.	11.8 lb./hp.

MAIN ROTOR

Diameter	34'
Number of blades	2
RPM. (rated)	324
Normal tip speed	578 fps.
RPM. ratio to engine RPM.	1/9.25

ANTI-TORQUE ROTOR

Diameter	5' 6"
Number of blades	2
RPM. (rated)	1875
Normal tip speed	540 fps.
RPM. ratio to engine RPM.	1:1.6

ALTERNATE LOAD ARRANGEMENTS

3 persons	1 person
90 lb. baggage	512 lb. baggage or cargo
212 mi. range	104 mi. range
2 person	1 person
70 lb. baggage	40 lb. baggage or cargo
408 mi. range	605 mi. range with extra gas load

OPERATING LOAD

800 to 1000 lb. may be made possible, depending upon gas load and removal of non-structural parts.

INSTRUMENTS FOR

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WESTON *Electronic Analyzer*—Model 769. Incorporating: 1. A conventional Volt-Ohm-Milliammeter with self-contained power source. 2. A high-impedance electronic Volt-Ohmmeter using 115 volt, 60 cycle power. 3. A stable, probe-type, Vacuum Tube Voltmeter, for use to 300 megacycles.

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These portable Westons are specifically designed for expediting electronic maintenance . . . for doing the job better—faster. All are engineered and built in the strictest traditions of Weston accuracy and dependability. For further details see your local WESTON representative, or write . . . Weston Electrical Instrument Corporation, 616 Frelinghuysen Avenue, Newark 5, New Jersey.

WESTON

Aircraft Instruments

Magnesium casting indicated by Otto Santoff, shop superintendent, holds tail rotor gears and shaft and cuts costs by requiring only inside finishing. Beaded skin of tail boom gives structural rigidity and eliminates expensive inner frame. Metal tail rotor blades are Hiller design.

Low cost universal joint, rather than gear assembly, is used to carry power to tail rotor drive shaft of Hiller "360". Mounting is inexpensive aluminum casting. Langhorne Washburn, United Helicopters operations manager, points to assembly.

stiffeners by using beaded sheet metal;

• **Substitution** of an inexpensive universal joint for the gear box conventionally used to transfer power from engine to tail rotor shaft;

• **Development** of a simplified engine-rotor transmission having only one planetary gear assembly;

• **Development** of an engine mount that, with engine in place and supported by four Lord mounts, attaches to the floor of the engine area with only four bolts;

• **Design** of the basic stressed body as a "platform" requiring no modifications to accept a variety of upper body cabin structures;

• **Further reduction** of control problems through design of an automatic throttle linked to pitch control lever. No twisting of pitch lever handle is required to govern throttle settings, although a fingertip lever attached to the pitch handle allows moderate override of automatic throttle for final adjustment of engine speed to most efficient rotor rpm. and pitch setting for various loads and cruising speeds.

▶ **Planned for Production**—Especially noteworthy is the fact that complete production planning was effected before the prototype 360 was moved from drafting boards to assembly jigs. Thus, the present flying model represents a design that can go into immediate commercial fabrication once C.A.A. certification has been granted.

For production simplification extensive use is made of cast aluminum and magnesium fittings and bearing housings which require only a minimum of inside machining prior to installation. Similarly, Hiller's company has designed its own simplified air-oil landing gear struts, tested to 4-G. impact loads, to bypass an otherwise heavy accessory cost.

In early stages of production, United Helicopters will farm out the manufacture of at least 70 percent of component parts of the 360 and will utilize the bulk of Palo Alto facilities for line assembly.

While it is evident that a stronger approach toward total manufacture of parts would lower costs appreciably for a long-range production program, there appears to be economic soundness in the company's current planning.

United Helicopters' program, which supports its likely ability to invade the helicopter market (as third U.S. commercial manufacturer) with comparatively light capitalization, can be appreciated in reviewing briefly Hiller's financial and manufacturing background.

▶ **Corporate Background**—At the age of 13 (1937) Hiller was acquiring valuable small-scale production line experience as owner of Hiller Industries, which made model gas engine race cars and later entered the aluminum die casting field with a centrifugal die casting machine invented by the boy.

Later, intrigued by helicopter experiments on the East Coast, he left University of California and in 1941 sold part of his interest in Hiller Industries to his father to gain working capital to set up, in Oakland, Cal., Hiller Aircraft Co.

During the ensuing two years he spent "over $50,000" of his personal capital in helicopter model experiments and production of his first single-place coaxial machine, which was ready for flight early in 1944.

Now ready to do business, Hiller won from the Navy an order for a full-size experimental rotor assembly, and another contract for a small-size "rescue kit" helicopter powered by a miniature gasoline engine and intended to hover with a radio antenna and be part of the rescue equipment of rubber life rafts.

Henry J. Kaiser was fascinated by the "boy wonder," his inventive genius and lively promotional ability. The end result was a Kaiser-Hiller partnership to develop a luxurious two-place cabin helicopter for the military and personal aircraft markets, using Hiller's original coaxial configuration.

▶ **Ends Kaiser Tie-Up**—It was a good try, but didn't work, and Hiller and Kaiser parted company at the end of 1945 after completion of a model that was shelved upon reaching the hovering test stage.

In the divorce action Hiller took with him his coaxial patents (Kaiser was given a license to produce the helicopter of their joint endeavor if he chose to do so) and a dozen engineering associates.

With this for working nucleus, he put up under $100,000 of his personal money and formed United Helicopters, Inc.

On his drawing boards went the design of a simplified "more productionable" coaxial model, and early in 1946 the time was ripe for a money hunt.

Pioneer* **Gyro Flux-Gate* Compass** FOR PINPOINT DIRECTIONAL ACCURACY

The Pioneer Gyro Flux-Gate Compass is a simplified earth inductor compass with gyro stabilized indications that afford a continually precise directional reference.

The Master Direction Indicator of the compass system indicates *true magnetic heading* at all times, including flight in high latitudes where swinging error is pronounced in conventional types of compasses.

The gyro stabilized Flux-Gate Transmitter is remotely located to be least affected by artificial magnetic influence, and remaining *deviation* is *eliminated* by a mechanical compensator in the Master Direction Indicator.

The accuracy of the Flux-Gate Compass and the nature of its electrical system are such, that it can serve as a link for the tie-in of automatic pilot, omni-directional range, and radio magnetic indicator equipment.

Master Direction Indicator for instrument panel installation. Repeater Indicators are also used in conjunction with the system and follow the compensated readings of the master indicator.

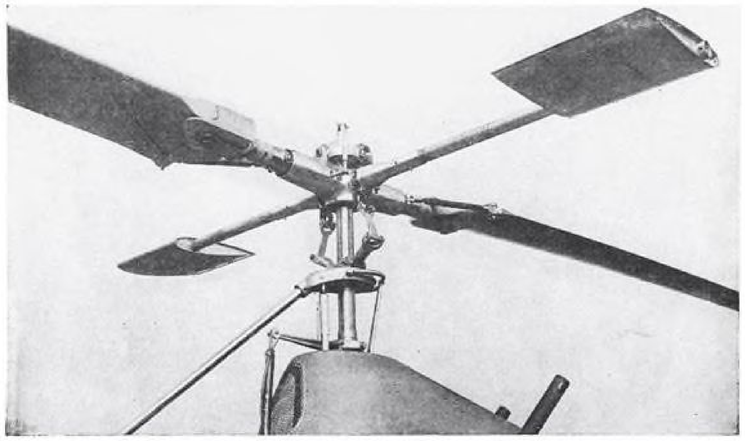
The Gyro Flux-Gate Transmitter is designed for remote installation in either wing or tail areas.

Also adaptable for installation in marine surface craft.

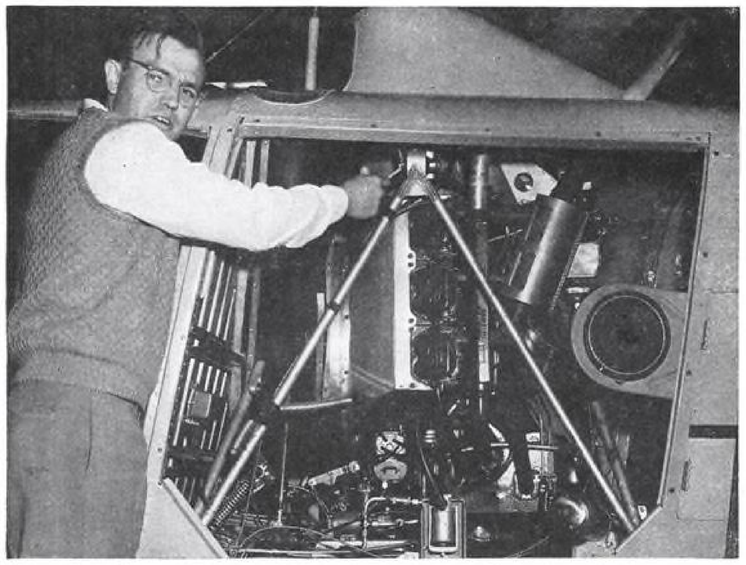
*REG. U. S. PAT. OFF.

Eclipse-Pioneer DIVISION OF Bendix AVIATION CORPORATION

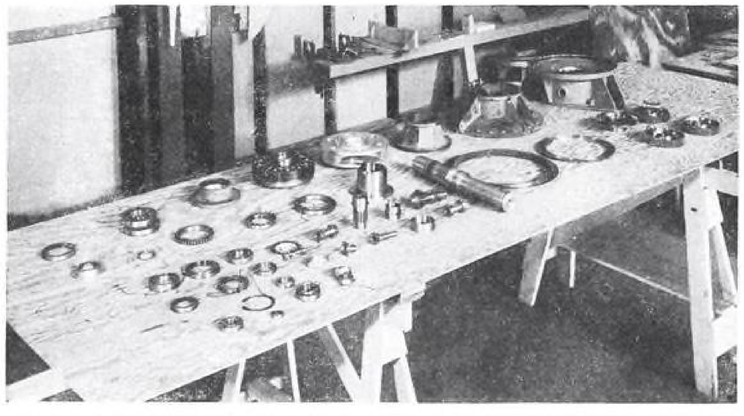
TETERBORO, NEW JERSEY



Servo rotor gives basic stability and aerodynamic flight control as well as rotor head structural simplicity. During year of patent application no contest of originality appeared.



Compact installation of Lycoming 178 hp. vertical engine is displayed by Webb Schentzow, mechanical engineer. He points to one of four Lord mount engine supports. Also visible are Kay Industries exhaust muffler; Farr Co. bronze wire carburetor intake air filter (circular disc at right); and at lower right gasoline intake leading to 29-gal. Firestone fuel cell.



Layout of parts of simplified transmission of Hiller 360 single planetary gear assembly.

Only four months were required for the sale of a 100,000 share United Helicopters stock issue that netted the corporation $840,000 after brokerage commissions.

For his licenses and equipment, such as it was, the corporation voted Hiller, as president and general manager, an equal block of stock (100,000 shares) that gave him controlling interest in the concern. Under California state corporation laws Hiller is prohibited from profiting on his shares until the company is paying dividends to its primary stockholders, numbering 1600 and all living in the San Francisco Bay area.

It is importantly significant, and showing the serious intent of this Palo Alto company, that there still remains a capital fund balance after two years of intensive research, maintenance of a development staff of as many as 30 engineers at peak design periods, production of a flight model and two completed bodies of the "Commuter" coaxial design, production of a single-place experimental test 'copter, production of the Hiller "360" now flying, and parts for three additional units now awaiting assembly, expenditure of $100,000 for testing equipment required in seeking certification of the 360, and purchase of a 61-acres factory site having rail spur facilities and highway access.

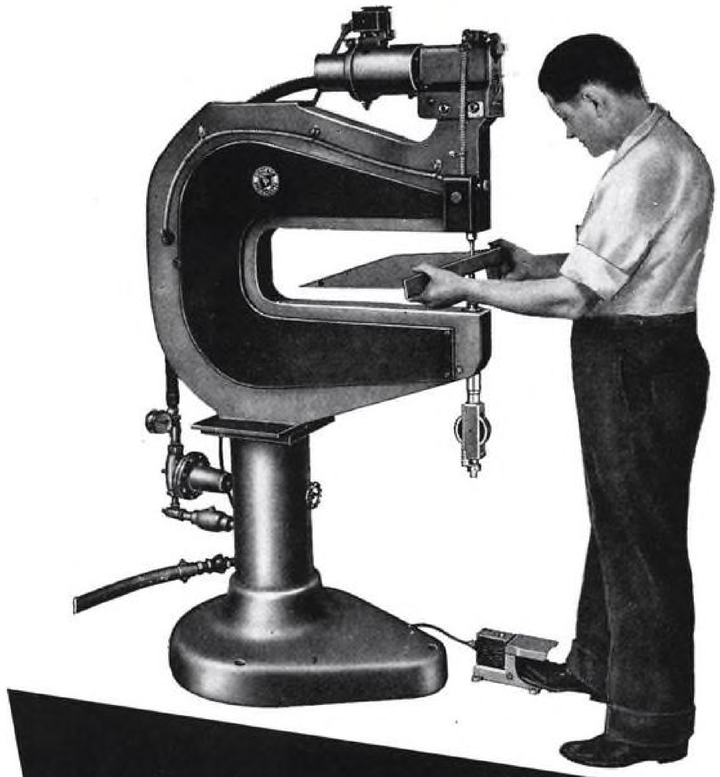
► **Have Capital for Production**—How much of the original $840,000 subscription net remains at this time Hiller does not disclose; but he says that United Helicopters has sufficient capital left, without floating more of the 1,000,000 shares authorized, to commence limited production scheduled to start early in 1948.

A matured manager and administrator at the age of 23, Stanley Hiller is somewhat horrified at the multi-million dollar expenditures that have gone into many other commercial helicopter ventures.

Hiller and his group individually work prodigious hours, and with zealot enthusiasm shed titles to become errand boys and janitors when indicated. Henry L. McIntyre, assistant to Hiller, and Langhorne Washburn, operations manager, told this writer separately that U.H. esprit is such that no work is contracted outside the organization if the job, no matter how small or large, possibly can be done by a company worker or executive during or after regular working hours.

As might be estimated, the pace set within the United Helicopters organization during the past two years has been exhausting.

Yet, the administrative and executive personnel seem to have survived it and appear to be ready to begin the manufacturing phase with refreshing enthusiasm.



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CP-450EA Pneumatic Riveting-Dimpling Machine assures precision coin dimpling of magnesium and the harder aluminum alloys. Deflection plate and adjustable coining ram pressure device (exclusive with Chicago Pneumatic) assure positive control of pressures between dimpling dies, irrespective of any line pressure variations.

This improved, electrically controlled machine eliminates cracked dimples . . . controls flushness to plus or minus .001" . . . and assures accurate nesting of dimples.

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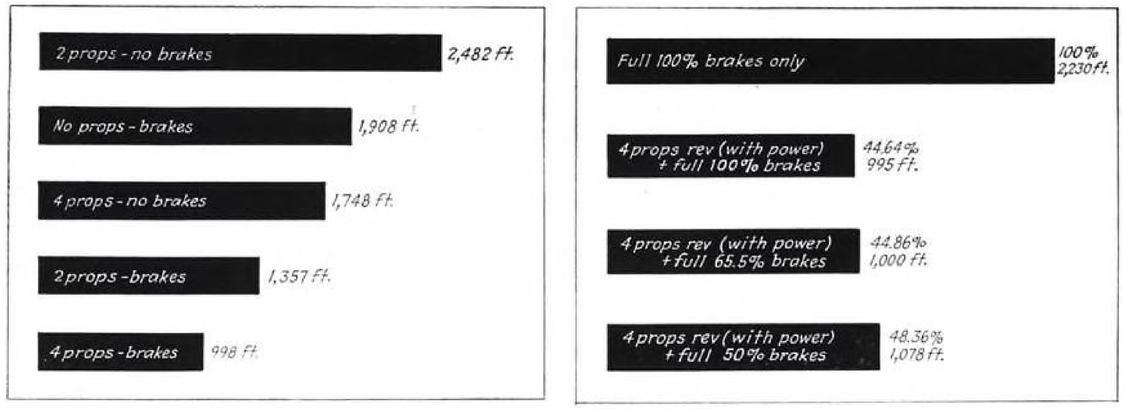

Above bar graphs are based on tests of a plane of approximately 90,000 lb. gross weight, fitted with fractional power brakes.

Reverse Pitch Props Offer Safety

Recent tests seen as speeding wider application of development that offers many subsidiary advantages such as saving in weight.

By ALBERT E. SMYSER, JR.

Successful reversing in flight of all four propellers of a DC-4 by Curtiss-Wright test pilot Herbert O. Fisher may add the final bit of knowledge to reverse-thrust information and enable wider application of reversible pitch propellers which—even in an early stage of development—already offer greater safety margins, saving in airplane weight, and lower brake size requirements.

Fisher's achievement culminates a C-W test program designed to determine results of applying reverse thrust under varying conditions. Specifically, the company sought to find out what happens when one or more propellers are reversed in the air, as the present reversing controls used commercially prevents this possibility and thereby, in the opinion of a group of engineers, would tend to limit the usefulness of reversible propellers.

► **Background**—Many attempts have been made to utilize the reversed thrust of a propeller operating at a negative blade angle as a means of braking the landing run of an aircraft. One of the earliest attempts was made in 1921 when the U. S. Army Air Service conducted experiments of this type with a JN-4H airplane.

The next noteworthy contribution was made in 1939 when a successful application of the principle was applied to the water handling of a Sikorsky XPBS-1 flying boat for the U. S. Navy. Based on this installation, reversible propellers were adopted by the Navy for four-engine flying boats—the PB2Y-2 in 1940, PB2Y-3 in 1941, and the Martin Mars in 1942.

► **Dual Investigations**—Two major propeller companies, Hamilton Standard, and Curtiss-Wright, have both been working on full feathering propellers since the middle 30s, and each had developed a reversible pitch propeller prior to the war. Reception of the units at that time was rather cool because the prevalent idea was that such a complex installation offered advantages only to seaplanes, and that an application to landplanes was useful only for extreme emergencies such as complete brake failure.

Further development of reversible propellers to make them suitable for application to landplanes was undertaken in 1942 for the Army Air Force. Mechanical adaptation was proved to be relatively easy but the development of suitable controls presented many knotty problems. Manufacturers were faced with the problem of trying to build a production article which the concepts as to its function and operation fluctuated from month to month.

► **Flight and Service Tests**—Initial installations were made on a B-26 and a B-17E, both of these planes were exhaustively tested at Wright Field in 1943, and the B-26 tests were continued in Alaska at Ladd Field, during the winter 1943-44, to obtain service experience on snow and ice covered runways.

Results of the initial tests led to the installation and service test of reversible propellers on a Boeing YB-29 during 1943-44, as a result of which the decision was made to install this type of propeller on the Consolidated B-32 bomber and on a quantity of B-29s.

► **Parallel Solutions**—Final results of independent investigations by the two companies, each working on the problem from a different angle, were astonishingly similar. The propellers operate with entirely different mechanical power—Curtiss-Wright's a projection of the familiar electric full-feathering propeller; and Hamilton Standard's, a development of the full-feathering "Hydromatic" propeller.

The ultimate cockpit control arrangements selected by each company were as nearly alike as the differences in mechanical problems would permit. Reversing of each is dependent on the operation of a sequence of electrical circuits which are energized and selected either manually or automatically. These circuits are so designed that they "fail safe" and prevent inadvertent reversal of pitch.

In early military and test versions, reversing was instituted manually by the pilot who carried out two separate operation: first, the system was "armed" and the propellers to be reversed were selected on a control panel; second, an initiating switch was closed after the plane touched the runway, starting the actual reversing process.

Success of flight tests indicated major benefits could be realized from the use of negative thrust in shorter landing

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Of all contributions to aviation since the war, none has had greater effect on safety, speed, and general operating efficiency than improved engine maintenance, and — according to leading airlines — one of the most notable factors in this general improvement has been increasingly greater lubrication efficiency.

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View of Clifford's Wind Tunnel Laboratory showing the hot tunnel section which tests oil cooler performance at sea level conditions.

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runs and reduced necessity for braking. Engineers proceeded to redesign the propeller for near-automatic operation so that full benefit of reverse thrust would be available to the pilot without the need of complicating cockpit procedures.

► **Modification Details**—Changes necessary to make a reversible unit out of the "Hydromatic" included cutting an additional cam track in the prop blades (opposite the feathering track) which will permit movement necessary to reverse pitch, and installation of electric contacts to provide indications of the blade positions for the constant speed circuit to insure proper return to normal operation after reversal.

In addition, a throttle block redesign was made to permit initiation of reversing procedure when throttles were moved aft of the idle position through a detent, and additional linkage was inserted in the throttle system to control engine power while in reverse pitch (pulling throttle further back after reversal increases power). The constant speed unit continues to control engine rpm. in reverse pitch.

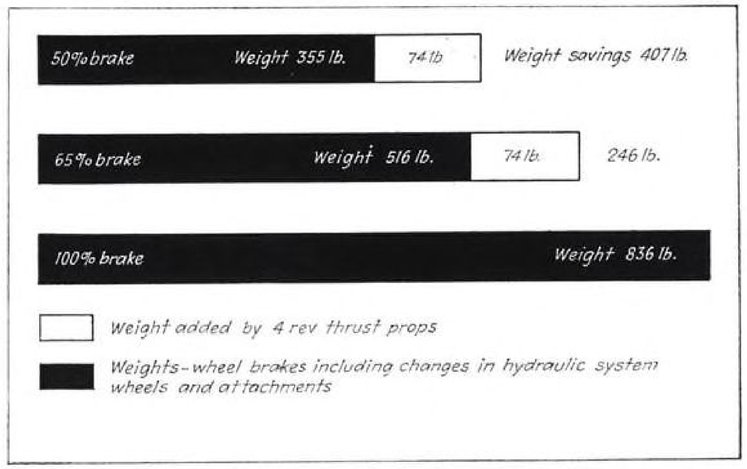
Adaptation of the Curtiss propeller was slightly less complicated since it was possible to use the same voltage booster for reversing as was formerly used in the feathering operation. Stops on the propeller blades were rearranged to permit blade movement to the reverse position and changes made in the constant speed unit to accommodate the additional amount of pitch change. The throttle block detent and additional linkage for engine control are basically the same as those used by Hamilton. With both propellers a mere 20 degree increase in movement is sufficient to reverse thrust.

Complications arose because the simpler reversing was made for the pilot, the more complex became the automatic devices necessary for correct sequence operation.

► **Weight Saving**—Application of reversible propellers to production aircraft may permit weight savings by reducing the requirements for brakes specified for a given airplane. These reductions amount in some cases to as much as 800 lb. with a reduction of nearly 50 percent in brakes required. The Air Force has already recognized the efficiency of this aerodynamic braking effect produced by reversed propellers and has approved smaller brakes for some advanced aircraft so equipped.

Advantages evident from service tests of the equipment include smoother stops, less wear and tear on tires, shorter landing runs, lower brake requirements, and more positive braking action on slippery runway surfaces.

► **Safety Studied**—Since the small brakes have been advocated, they have undergone rigid tests and have been proved adequate to handle two full-stop landings at normal approach speeds without the use of reverse thrust. It is considered therefore that the safety of planes operating with reduced brake area, in the event of a total failure of the negative thrust feature, is well within permissible limits.



Comparative brake weights used on aircraft fitted with four reversible propellers. Brakes indicated provide adequate safety for emergency stops.

Whether the CAA will immediately approve reduction of brake sizes is not known, but it is expected that tests will be conducted by the Authority before changes are authorized.

► **CAA Requirements**—CAA approval of the reversing system is predicated on the approval of all the required safety features incorporated in a given installation, and is not a blanket approval for the system on all types of aircraft. When installed on commercial airliners, CAA requires that the system be guarded so that reversal may not be accomplished until the landing gear is in contact with the runway.

CAA requires that provision be made to prevent, mechanically, the reversing of pitch on a multi-engine plane while the plane is airborne. This is accomplished by the addition of a solenoid in the throttle block which prevents the throttles being moved back through the detent until it is released by an automatic signal which is originated by the closing of a micro-switch on the landing gear shock strut.

► **Advocate Simplification**—The manufacturers point out that while they are installing the devices in accordance with CAA specifications, they feel that the safety regulations, as laid down, do not represent the ultimate perfection and safety possible for such installations. They feel that some of the proposed installations they have designed for military aircraft (already approved by the Air Force) offer more advantages and at least equal safety using simpler arrangements.

So far the Curtiss-Wright reversible propeller installations have been approved as equipment for DC-6s and numerous Navy flying boats, and several forthcoming Army and Navy transport planes.

Hamilton Standard propellers with reversible pitch have been certificated by the CAA but so far no specific installations have been approved. The company has indicated that when such installation approval is received, "kits" will be made up for various large aircraft currently using "Hydromatic" props to effect the change over to reversible pitch mechanisms, provided of course that control pedestal arrangements are adaptable to the installation of additional equipment necessary to effect the changeover.

Television Rocket Tests Held by Aerojet and GE

Installation of a television camera inside rocket engine test cells permitting a complete view of the unit being tested as well as all accessories used in the course of the test providing comfort and added safety for the observers, has been announced by engineers of Aerojet Engineering Corp. and General Electric Co. after successful completion of early tests.

Cameras permit close-up views (previously impossible without subjecting observers to great danger) of individual components for special examination during operation.

New system permits remote viewing of the test cell interior without necessitating use of the usual small, slit windows in the compartment.

Leading-Edge Jet Indicates Added Lift

Studies indicate potentials of airfoil fitted with spanwise nose slot; now being applied to rotorcraft.

By IRVING STONE

Wind tunnel investigations of a model airfoil fitted with a novel leading-edge cold-air jet installation has disclosed that it is possible to obtain 50-200 percent increased lift (above that of the basic airfoil characteristics), giving at the same time an induced "anti-drag" or propulsive force.

Location of the wing jet—a critical factor—is within the leading edge circle (roundness of the wing nose). This critical location, it is claimed, distinguishes it from other wing jets utilized for boundary layer control.

► **Advantages of the jetted wing** is stated to include a high factor of stability resulting from the influence of the jet action in smoothing out and accelerating the airflow over the wing. Also claimed with this arrangement is the ability to take off and land at high angles of attack with loads sustainable at cruising speed. And special value is seen in emergency landing, to permit a "settling" aproach.

Power for the air jet would be derived from a blower driven from the main or auxiliary power plant.

► **Comparative Studies**—Extensive investigation conducted at Carlat Development Corp., Beechhurst, Long Island, N. Y., has afforded interesting results in comparative studies of jetted and unjetted versions of a Glenn L. Martin 21 model airfoil possessing normally high-lift characteristics.

Although the opening of the jet slot is upward, the jet flow closely follows the wing contour. This is because the jet inner layer tends to adhere to the wing skin, flowing slower than the outer layer, causing bending to wing contour.

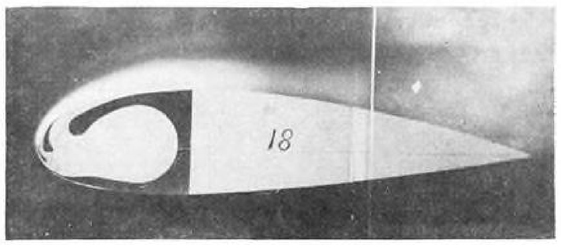
Maximum speed of flow is at the jet exit from the wing, and in this vicinity greatest value of circulation is obtained. This is reported to give an increased pressure difference between the area encompassing the extreme leading edge together with forward portion of the upper camber, and the wing undersurface. The pressure difference, it is claimed, slants the lift or aerodynamic resultant from an aft to a forward inclination, thus providing the induced "anti-drag."

The comparative studies of the jetted and unjetted wing models have been conducted in a small open channel-type tunnel equipped with simple pendulum-type balances, where forces exerted on the wing were indicated by deflection of pointers on lift and drag dials. "Anti-drag" was evidenced by rotation of pointer towards the negative side of the dial.

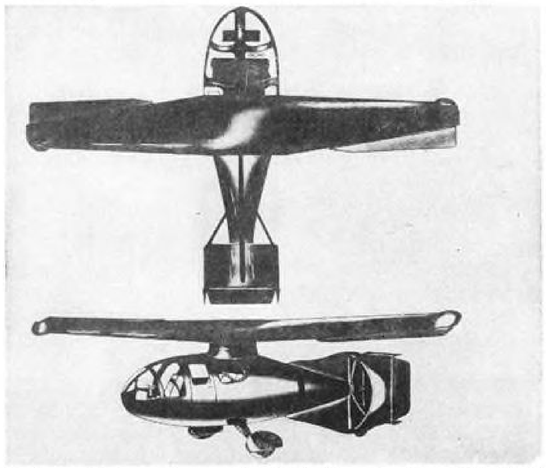
Referring to the accompanying sketches of airfoil forces, Fig. 1 shows both lift and drag indicators at zero—tunnel and leading edge jet not operating. Fig. 2 shows the jet operating in still air with airfoil at zero angle of attack. Even though the jet opening is upward, after a momentary slight downward reaction, a positive lift is generated. Predominating forward resolution of the lift force generated by the jet flow causes the drag dial pointer to rotate to the minus side of the scale, indicating an "anti-drag" force affording propulsion. Scale of lift and drag forces as shown in the sketches is $\frac{1}{32}$-in. per 2 points (1 deg.) on 720-point dial.

Fig. 3—Wing at zero angle, with tunnel only operating, hence the representation is lift generated by model without

Early experimental Carlat leading-edge-jet rotor with lobes for elimination of tip vortex. Rotor is ducted to blower.

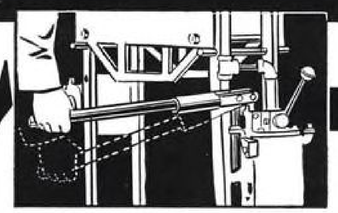


Model airfoil section in smoke tunnel. This is three-jet version, with main jet located on chord line at extreme leading edge.

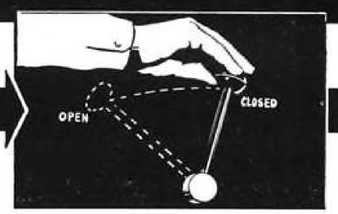


Design projection of rotorcraft with leading edge jets. Wide-chord rotor carries jetted-lobe and flaps, with air feed from blower.

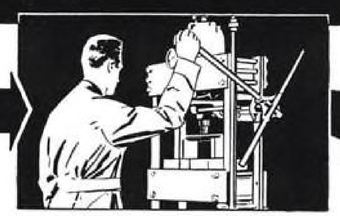
These KRW Hydraulic Arbor Press Features ...



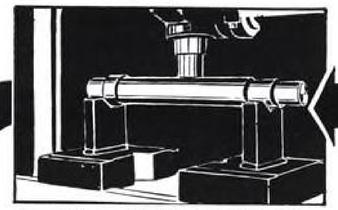
Fast Action, cylinder is filled as ram travels to work. You get tons of pressure with first pump stroke.



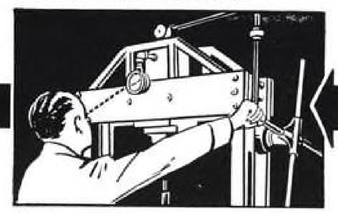
Finger Tip Control opens and closes valve in a jiffy. No gripping effort assures easier, faster operation.



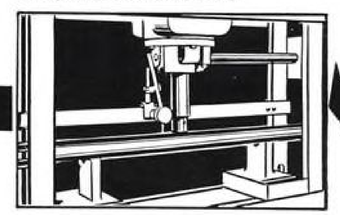
KRW Built-in Mechanical Press permits up to 3 tons pressure for straightening small diameter work.



One Piece, All Steel V-Blocks have machined surfaces for greater accuracy; usable upright or inverted.

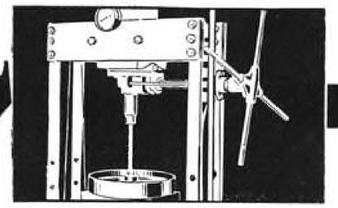


Highly Visible Pressure Gauges are mounted where they can be quickly checked. Read in tons and pounds.

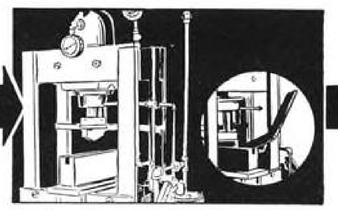


Micrometer Dial Attachment permits great accuracy in checking work without removing from V-block.

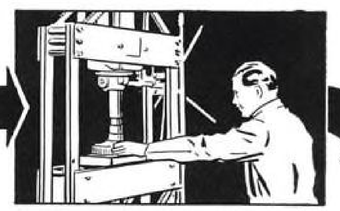
Reduce Costs ON THESE AND OTHER DAILY Production Jobs ...



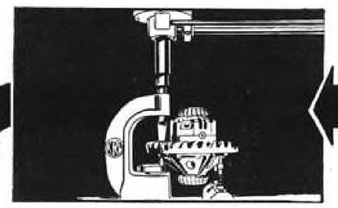
Broaching a key way in a flywheel. 7½ inch ram travel makes many broaching jobs practical on KRW Presses.



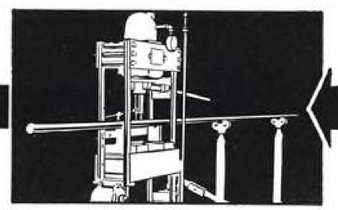
Bending in production lots with simple, inexpensive dies is easily done on low-cost KRW Hand-operated Presses.



Pressing of all types is efficiently handled. Adjustable bed makes pressing on long shafts a very simple operation.



Riveting with KRW Riveting Attachment is simplicity itself. Many KRW Presses are used for this type work.



Straightening, especially on long work, is easy on a KRW Press because of its special open-end construction.

Blanking is easy with simple die set for short-run operations. Releases regular equipment for quantity production.

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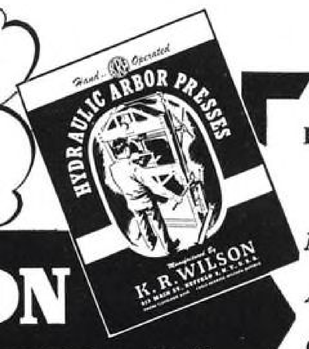

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J-M PACKINGS, Gaskets and Asbestos Textiles help safeguard this great new bomber

NOW in full production for the Army Air Forces, the Consolidated Vultee B-36 is protected by a number of flight-tested Johns-Manville products.

Expansion joints in the exhaust manifold system are tightly sealed with Johns-Manville Inconel Packing. This resilient packing, developed especially for this type of severe service, effectively withstands the combination of extreme temperatures, unusual corrosive conditions and severe vibration which would quickly reduce an ordinary packing to ashes.

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Brochure AV-1A gives complete information about these and other Johns-Manville products for the aviation industry. For your copy, address Johns-Manville, Box 290, New York 16, N. Y.

Inconel Packing installation in slip joint just aft of heat exchanger in B-36.

J-M No. 95 Neoprene-Asbestos Sheet Packing installation in fire wall of B-36 nacelle.

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jet effect. Drag value reflects drag of the model supporting-structure as well as the wing, the former being in far greater proportion. Fig. 4—With both jet and tunnel operating (tunnel at same speed as in Fig. 3) lift increase of about 4 to 1 is obtained with corresponding drag decrease of such magnitude that it is resolved into anti-drag or propulsive force. Lift dial records 98 points, hence three arrows of 25 points and one of 23 points represent total lift.

Fig. 5—Wing model is at —4 deg. angle of attack, tunnel only operating. No lift is indicated. Drag is 24 points. Fig. 6—Application of jet shows substantial lift generated, giving anti-drag effect (—30 points).

Fig. 7—Tunnel only, wing at 12-deg. angle. For a very short period, lift dial shows 97 points (represented by one solid, two dotted lines). Almost immediately, lift falls off to 34 points (solid line), indicating stall. Fig. 8—With jet turned on, lift remains constant at about double the value shown as maximum prior to stall without jet (Fig. 7). Propulsive force is indicated.

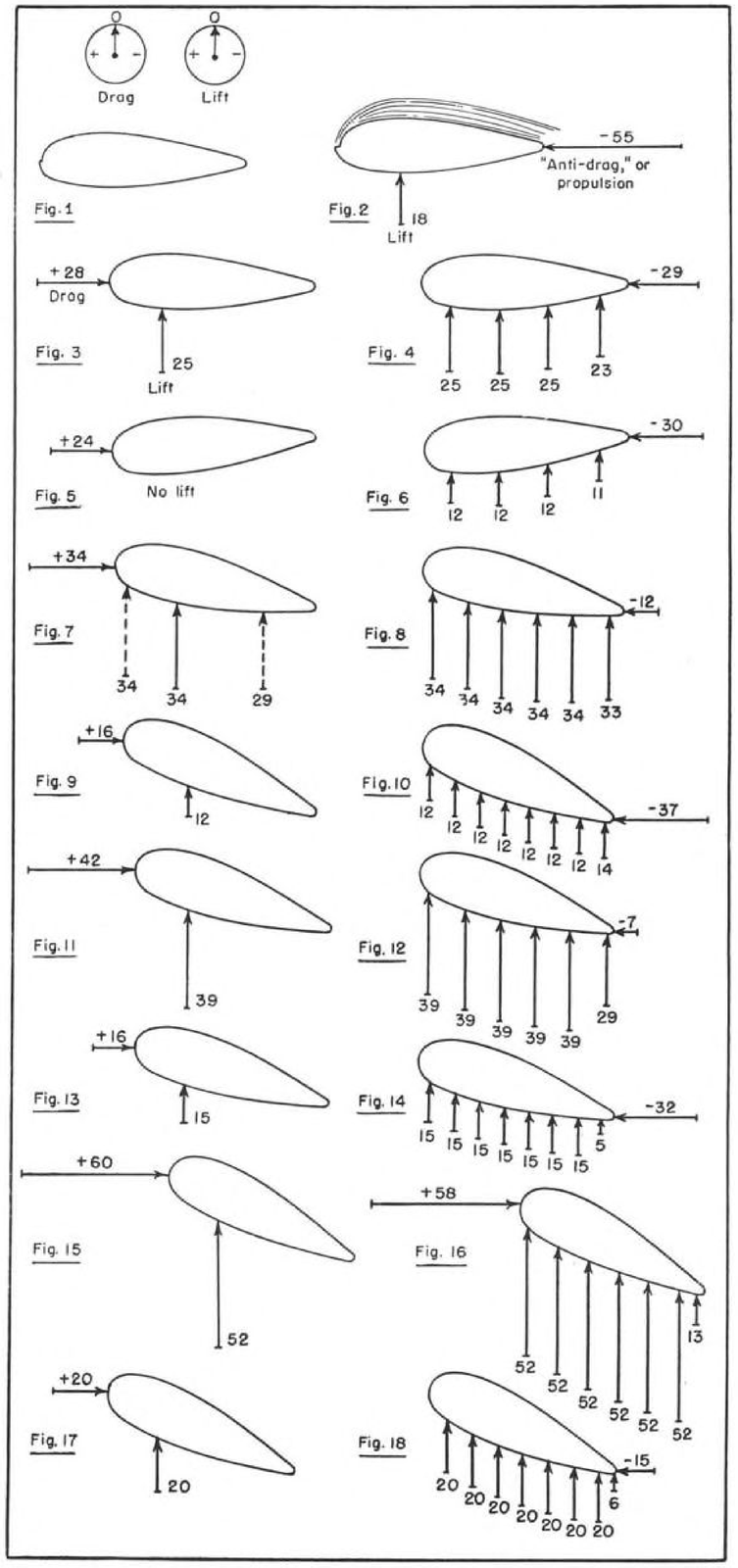
Fig. 9—With 12-deg. angle and tunnel speed reduced to about 25 percent of full speed, and without jet, lift dial indicates 12 points (insufficient to sustain flight). Drag dial shows 16 points. Fig. 10—With jet operating, lift is increased more than eight times, and propulsive force is indicated.

Fig. 11—With full tunnel speed, wing is at 16 deg. angle (stall). Drag has increased over that shown in Fig. 7, and lift has fallen off abruptly. Fig. 12—With jet applied, instant recovery occurs, lift increasing nearly six times. Propulsive force is (—7 points).

Fig. 13—Wing is at 16-deg. angle, tunnel speed is reduced to about 25 percent. Lift dial indicates 15 points, drag dial 16. Fig. 14—With jet on, lift is approximately equal to value at zero angle with tunnel at full speed and jet operating (Fig. 4), indicating that jetted airfoil shows potentiality to take off and land at high angles of attack with loads sustainable at cruising speed.

Fig. 15—With full tunnel speed only, wing is at 25 deg., in complete stall. Slight lift increase is indicated over that of 16-deg. angle in Fig. 11, as well as a drag increase. Fig. 16—With jet on and full tunnel speed, immediate recovery of lift is obtained. Drag remains about same as with no jet, being utilizable as braking force during landing. This gives indication of possibility of landing at angle of descent of about 70 deg., with a settling, rather than a gliding approach (most power flowing into the jets), thus providing stability for landing.

Fig. 17—With tunnel at about 25 percent full speed, and wing at 25-deg. angle of attack, with no jet, dials show



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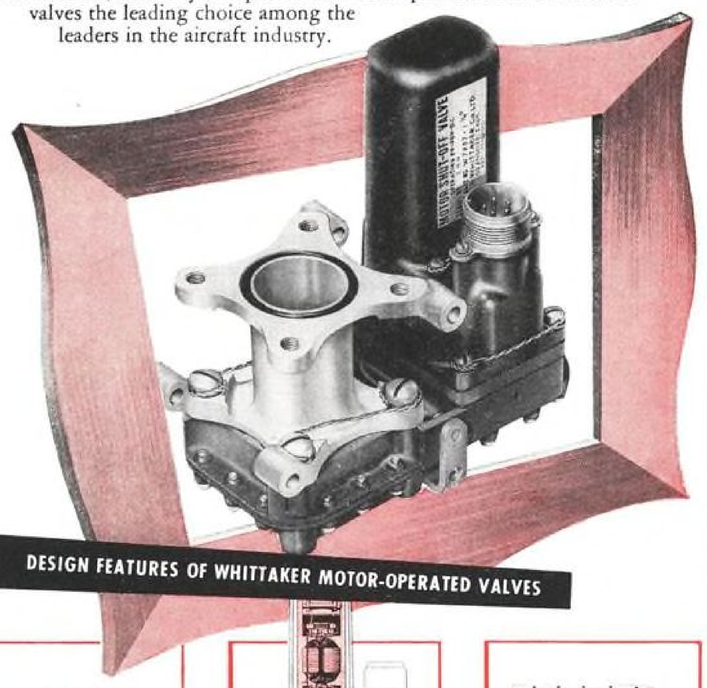
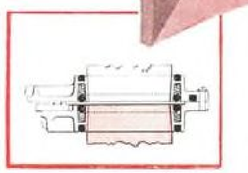
In designing the giant, new B-50 Superbomber, Boeing engineers selected Whittaker Motor-Operated Valves for control of the vital fuel system. To meet the specialized requirements of the B-50, Whittaker engineers redesigned the basic motor valve pattern to include a special mounting adapter. It is this individual engineering of field-proven designs, combined with modern, assembly-line production techniques that make Whittaker valves the leading choice among the leaders in the aircraft industry.



DESIGN FEATURES OF WHITTAKER MOTOR-OPERATED VALVES



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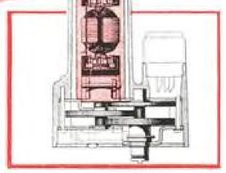
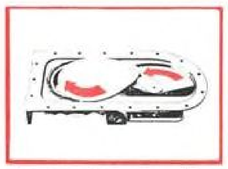


POWER PACK—Small, d.c. motor operates sliding gate through spur gear reducing unit. 6, 12 or 24 volt motors available with operating times of 1 to 60 seconds.



GATE ROTARY MOTION – Turning of sliding gate gives even spreading of sealing rings. During opening, this action breaks seal reducing operating torque.

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20 points of lift, 20 of drag. Fig. 18—With jet applied, tunnel still at reduced speed, dial shows lift of 146 (about seven times that with no jet), drag dial shows propulsive force (—15), as against prior drag of 20.

► **Jetted Rotor**—Principle of the jetted airfoil has been applied to a rotorcraft presently under construction at Carlat, and flight tests are contemplated to prove the general feasibility of the leading edge jet as a means of rotor propulsion.

Advantages of a 'copter with a jetted rotor are claimed to include elimination of rotor-reaction torque on fuselage; elimination of transmission mechanisms, giving simplified construction, maintenance, and control; and increased overall lift for greater carrying capacity and improved aerodynamic lateral balance of rotor in directional flight. This balance would be accomplished, it is claimed, not by oscillation of rotor blades, but by blades fixed at a set angle of attack, where lift variations on the advancing and retreating blades would be obtained by jet control and jet effect on a special flap, together with slight tilt of the disk vertical axis in direction of flight.

The flap would serve to increase or decrease lift on either blade, either for collective pitch, or for cyclic pitch as a means of flight control.

Rotor jet extends inward from tip about ⅔ the blade length.

Rotor tip is constructed in the form of a lobe completely enveloped by jet flow. Purpose of arrangement is to eliminate tip vortex formations.

Flap tip (behind lobe) is also completely enveloped by jet flow. Flap portion behind jetted span of the rotor is subject to jet flow only over its top.

► **Rotorcraft Details**—Rotorcraft under construction comprises a power plant driving a centrifugal blower for air supply through a hollow uptake to interior of the rotor blades. Speed of air transmission is comparatively low, thus minimizing transmission losses and building up static pressure within the blade. Action of the high speed jet at the leading edge gives the lifting rotative force to the rotor blades for vertical flight.

Directional propulsion is to be achieved with a reversible pitch pusher propeller located aft of the blower on the same shaft. Prop is to be enclosed in a tail group arrangement comprising a shroud for covering the blade tips, and vanes for horizontal and vertical control.

Even though substantial expectations may not be realized in initial applications of the wing leading edge jet, interesting potentialities—or limitations—should be uncovered, providing data for refinements or new studies.

NEW AVIATION PRODUCTS

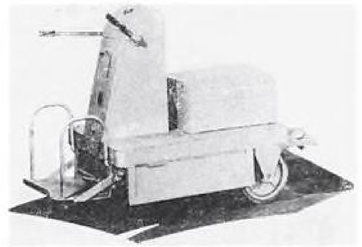
Utility "Buggies" for Airports

Airport utility trucks in two versions—motorized wheelbarrow, and flat-bed hauler—are offered by **Whiteman Mfg. Co.**, 3249 Casitas Ave., Los Angeles, Calif. Both have chassis equipped with either single or dual wheels and rear

wheel drive having 360-deg. rotation. Power is 6-hp. 4-cycle, air-cooled gas engine with automatic clutch and variable speed changer through worm gear reducer. Wheelbarrow model has 2,000-lb. or 12 cu. ft. capacity, at speeds ranging from 2 to 15 mph., forward or reverse, and ability to climb 25-deg. ramp with load.

For Close-Quarter Towing

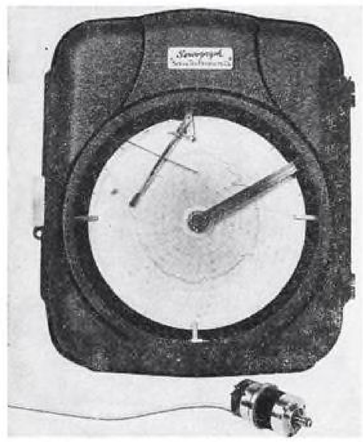
Suitable for interdepartmental plant haulage, lightweight, inexpensive electric tow unit stated to combine wide maneuverability and ruggedness with low operating and maintenance cost, is offered by **Rocky Mountain Steel Products, Inc.**, 1360 Wall St., Los Angeles 15, Calif. Having turning radius of only 72 in. to allow turn into 62-in. aisle, truck is described as capable of hauling 10,000-lb. trailer loads three to four times faster than walking speed. Operator can face in either direction to avoid time loss when approaching and engaging trailer train and maneuvering in opposite direction away from con-



gested area. Wheel base is 30 in.; overall dimension, including hitch, 75 in. Speed of 6 mph. is attainable with 24v. battery, 8½ mph. with 32v.

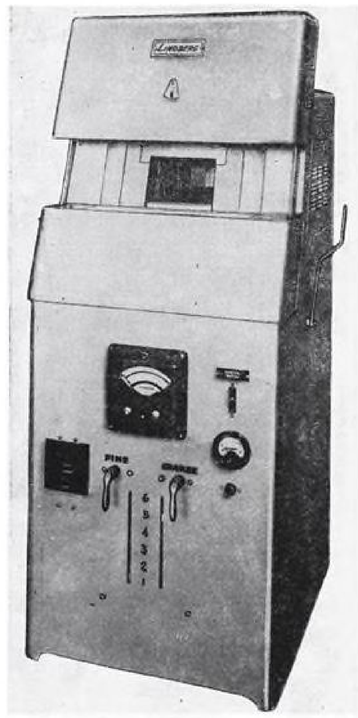
Aircraft Test Recorder

Available in models for use in aircraft testing with plane's 400-c. supply, **Servo-Tek Products Co.**, 247 Crooks Ave., Clifton, N. J., announces new type position recorder for graphing mechanical motion or position. Known as "Servograph", instrument utilizes 10-in. circular chart with inking pen motivated from remote point by self-synchronous motors. Satisfactory operation is claimed with distances as great as 1,000 ft. separating instrument and transmitting synchro. Receiving synchro is connected to pen through variable ratio mechanism, and by single adjustment pen will move full chart range with any desired motion of synchros within range of ½ to 10 revolutions. This is stated to permit high accuracy, making possible remote recording of variables which can be converted to rotation of transmitter shaft, including pressure, temperature, flow, and most mechanical movements.



For Heat-Lab Studies

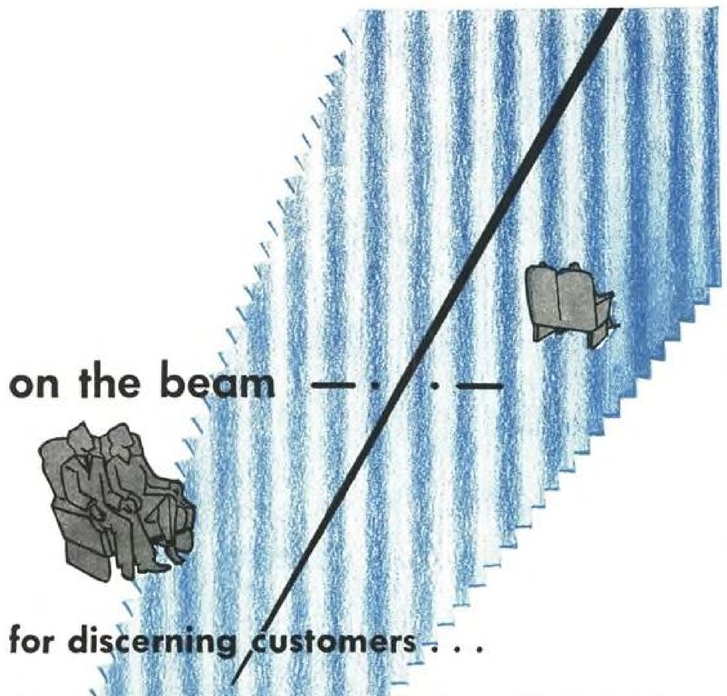
New box type laboratory furnace with temperatures up to 3,000 deg. F. top heat, and for continuous operation as high as 2,500 deg. F. is product of **Lindberg Engineering Co.**, 2444 W. Hubbard St., Chicago 12, Ill. Self-contained unit may also be used as muffle furnace, or with carbon blocks for non-oxidizing atmospheres. The 3,000 deg. capacity provides heat at lower level more quickly, and ten silicon carbide "Globar" heating elements insure uniform heating. Furnace temperatures are regulated by indicating-controlling pyrometer with electronic circuit. Model G-10 is designed for operation on 230v., 60-c., single phase a.c.; special voltages in a.c. are offered to specifications. Variable voltage trans-



former, contained within unit, has capacity of 8 kw. and is used in conjunction with two tap switches, each having six control points for voltage regulation.

Supplements Welding Equipment

Applicable for production and repair phases of brazing, soldering, supplying heat for light forging, preheating before welding, and tempering, new **Flexarc** carbon arc torch announced by **Westinghouse Electric Corp.**, P. O. Box 868, Pittsburgh 30, Pa., has leads with bayonet attachment plugs to fit company's WT Midget Marvel and Limited Input welders. Included are two 10-ft. flexible welding cable leads, and one pair each of ¼ and ⅜ electrodes.



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Information Tips

Details of Low Tension Ignition

Brochure describing company's new low tension ignition system is available from **Scintilla Magneto Div., Bendix Aviation Corp.**, Sidney, N. Y. Described are major advantages of system and basic differences between it and conventional high tension type. Presented in color, brochure, has 14 pages and features many schematic diagrams, charts, and photographs.

Facilitates Metal Cutting

Information is available from **Eutectic Welding Alloys Corp.**, 40 Worth St., New York 13, N. Y. on metal-cutting with new electric arc-vapor metal-cutting tool known as "Cut-Trode," which carries special exothermic coating for focusing and itensifying energy of electric arc, so that steel plates or sections are spliced through with scalpel-like precision, without necessity for external equipment such as oxygen and gas tanks. Device is stated to cut all types of metals including those difficult or impossible to cut with jet torches, such as cast iron, stainless steel, copper, nickel, or aluminum alloys. Effective cutting is claimed at high or low current, depending upon degree of speed required, and various thicknesses of metal are sheared through simply by augmenting amperage.

Lighting Equipment for Airports

"Open All Night" is title of new bulletin, No. 47050, issued by **Line Material Co., Airport Lighting Div.**, East Stroudsburg, Pa., describing CAA-approved elevated runway lights, power and control units, cable splice kit, obstruction lights, rotating beacon, and Bartow high intensity runway and approach lights. Included is miniature representation of typical lighting installation for small airport.

Aviation Fuel Tester

Circular 15-46 describing operation and specifications of Knockometer Model K-1 for aviation fuel testing on single cylinder laboratory engine is issued by **Sperry Gyroscope Co.**, Great Neck, N. Y.

New Welding Equipment

Of interest to production engineers is illustrated 8-page, two-color folder describing three new types of Heliweld equipment offered by **Air Reduction Sales Co.**, Dept. 1632, 60 E. 42nd St., New York 17, N. Y. Given are advantages and uses of welding process and construction details of equipment employed.

Data on Bearings

New 16-page ball bearing catalog No. 2001 published by **Jack & Heintz Precision Industries, Inc.**, Cleveland 1, Ohio, for assistance of designers and operating engineers gives millimeter equivalents and bearing specifications and equivalents. Included is comprehensive chart explaining standard numbering code of Anti-Friction Bearing Mfrs. Assn. Also contained is pictorial section devoted to J&H bearing production methods.

For Aircraft Soldering

Single-page circular of company's electric soldering irons as used in the aviation industry, is offered by **Hexacon Electric Co.**, 161 W. Clay Ave., Roselle Park, N. J.

British Aircraft Instrument Panels

Cockpit layout engineers and instrument panel designers of personal, executive, and transport planes will be interested in 16-page booklet titled "Choice of an Industry" offered by **Smiths Aircraft Instruments, Ltd.**, Cricklewood Works, London, NW2, containing up-to-date illustrations of instrument panels of all new British civil aircraft.

Corrosion-Resistance Computer

New slide-rule-form computer is offered free, as aid to engineers who specify metals to be used in corrosive environments, by **H. M. Harper Co.**, 2620 Fletcher St., Chicago 18, Ill. Device is stated to be based on exhaustive tests and classifies resistance of 13 non-ferrous and stainless steel alloys in 142 corrosive applications with degrees of excellent, good, fair, and no good. Footnotes broaden scope of applications to include most common uses and many unusual ones.

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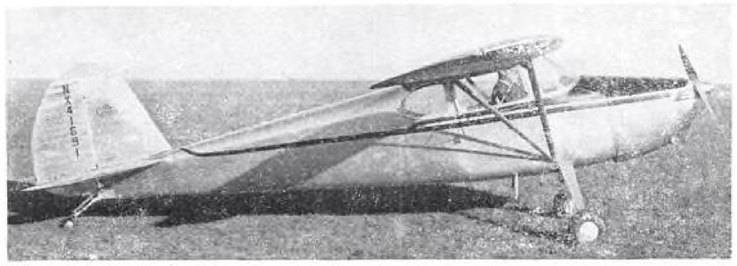

CESSNA 170 PRICETAGGED AT $5,475

First photo release of the new 145 hp. four-place Cessna Model 170 shows its strong family resemblance both to the smaller two-place Cessna 140 and its larger brother, the Model 190-195. Plane is price-tagged at $5,475 Flyaway, Wichita, and will be ready for delivery beginning in March.

Stiff Four-Place Competition Seen For Lightplane Market in 1948

Cessna, Aeronca, Piper will enter field to increase rivalry in family plane and bring prices below $5,000.

By ALEXANDER McSURELY

Introduction of a new 145 hp. class of four-place models into the personal plane competition next spring, by Cessna, Aeronca and Piper, is expected to step up rivalry in "family" plane sales and bring down four-placer minimum prices to a new low, presumably well below $5,000.

A tabulation of four-placers now in production or tentatively scheduled to reach the market by around April 1, 1948, shows that 10 manufacturers are aiming for a slice of this market:

- Aeronca Model 15 (price unannounced).
- Beech Bonanza ($8,945 Flyaway Wichita).
- Bellanca Cruisair Sr. ($6,350 Flyaway New Castle, Del.).
- Cessna Model 170 ($5,475 Flyaway Wichita).
- Cessna Models 190-195 ($12,750 and $13,750 Flyaway Wichita).
- Ercoupe Four (price unannounced).
- Fairchild Model 47 (price unannounced).
- Luscombe Silvaire Sedan ($6,995 Flyaway Dallas).
- Piper Four-Place Cruiser (price unannounced).
- Ryan Navion ($8,750 Flyaway San Diego).
- Stinson Voyager ($5,889 Flyaway Wayne, Mich.).
- Stinson Station Wagon ($5,989, Flyaway Wayne, Mich.).

Engineering & Research Corp., Riverdale, Md., which is developing the two-control low-wing Ercoupe Four with 165 hp. or 150 hp. engine, has made no indications as to when the airplane will be definitely committed to production. Even if Erco goes full steam ahead the Four probably won't be ready for deliveries until late next spring.

▶ **Fairchild Entry**—The other new low-wing entry, the 165 hp. Fairchild Model 47, likewise is still uncertain as to final production commitments, and is not likely to go on the market before late spring.

Simultaneous announcements last week by Cessna and Aeronca of their 145 hp. four-placer, with a Cessna pricetag of $5,475, lowest current price for a four-placer, pointed up an industry swing toward lower prices.

▶ **Cessna Production**—Cessna President Dwane Wallace said production of the 170 would start shortly after the first of the year with deliveries beginning in March. Cessna engineers and test pilots are "very pleased" with the flight tests which have already been made. Performance figures are being withheld following company practice until CAA approval tests have been completed. The plane is described as a "better than 100 mph." airplane, which is probably tinged with the usual Cessna conservatism.

Although photographs of the 170 look like a "blown-up" version of the two-place Cessna Model 140, Wallace reports that the 170 is a "full-size four-place airplane with adequate space for comfortable seating of four large persons and with a roomy baggage compartment at the rear of the cabin." Plane has a metal fuselage and fabric-covered metal construction wings, braced by double struts. It is described as a development of long-term planning and coordinating design and production facilities with the other Cessna models. Many of its parts are interchangeable, as previously reported, with the two-place Models 120 and 140 and the big four-five place Models 190-195. That the new plane is considerably lighter than the big 190-195 Models is indicated by the fact that it uses the lighter Model 120-140 size vanadium steel spring landing gear.

▶ **Cost Challenges**—Wallace says the Model 170 represents the outstanding value per dollar in the four-place field. How long Cessna will be able to hold title of the lowest priced four-placer may depend on dates of Aeronca and Piper announcements.

Aeronca's first release on its 145 hp. Model 15 states that it is expected to sell for "substantially less than any existing four-place aircraft." Unofficial reports from Middletown are that the Aeronca 15 price will be lower than the Cessna 170, while Piper, always a formidable contender in the lowest-price field, has not yet made formal announcement of his plane.

Reports from Lock Haven indicate that the piper four-placer, which is a logical development from the three-place Super Cruiser, may be available with the present 100 hp. Lycoming engine which powers the three-placer, or may offer a choice of 125 or 145 hp. powerplants. Piper has shelved any immediate plans for production of the promising low-wing retractable gear four-place 165 hp. Skysedan. From development cost standpoint a four-place Super Cruiser, with 100 hp. Lycoming engine would probably be the lowest cost four-placer among those considered in this analysis.

▶ **Aeronca Test Flight**—Chief Test Pilot Lou Wehrung reports that the first test flight of the four-place Aeronca exceeded theoretical performance calculations, particularly in the shortness of takeoff run with full gross load, and in slow landing speeds. Model 15 is a high-wing strut-braced Monoplane with fixed gear and conventional controls designed for easy transition of pilots from the two-place Aeroncas, and for flying

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Lucille M. Dingley
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"...DEPENDABLE QUALITY"

Raymond J. Ellis
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J. David Finger, Bernard S. Chodos
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J. Wayde Stewart, Parkersburg
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"ESSO IS IN STEP WITH THE TIMES"

Findley Wilson, New Castle Airport, Pennsylvania

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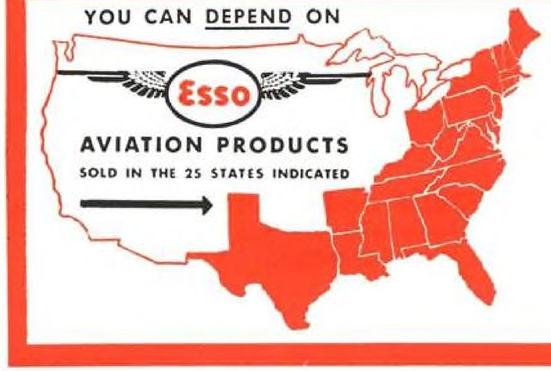

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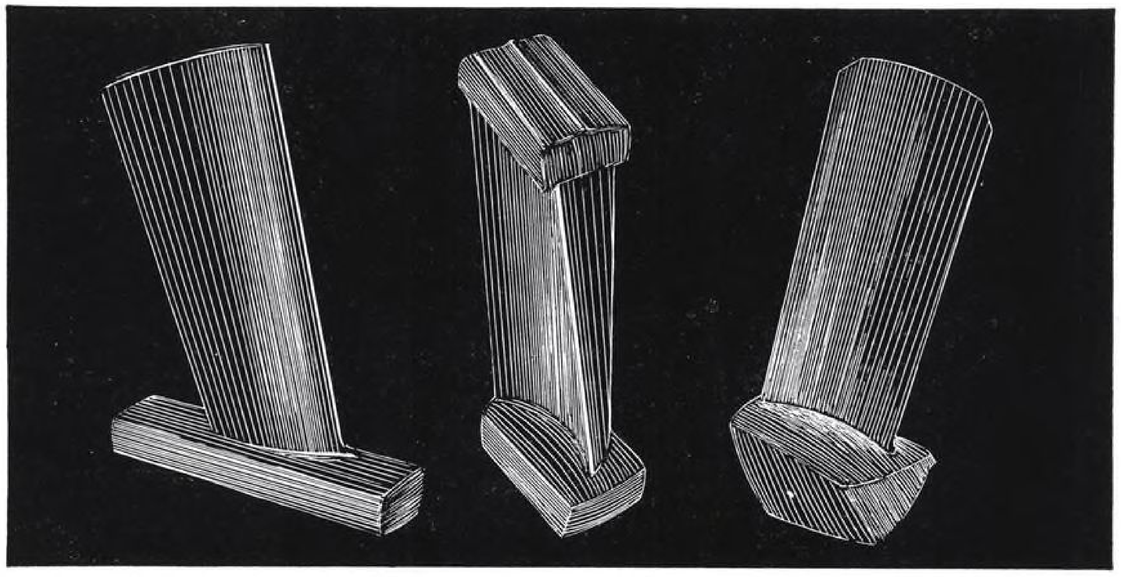

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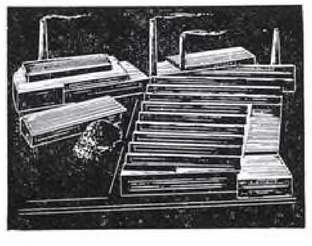

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in and out of the same small airstrips and fields which they can use. Presumably it is of steel-tube and fabric construction, since Aeronca has previously varied from this type of construction only in development of experimental planes, like the wood-construction two-place Arrow, and the all-metal two-control two-place Chum.

Useful load of the Model 15 is over 900 lb., the manufacturer states. The 145 hp. engine is supplied complete with starter and generator, and navigation lights and two landing lights are provided. Plane has 100 cu. ft. interior, and "provides exceptional visibility, headroom, legroom, and seat width," the announcement reports. The new Aeronca is expected to be "in production in the first quarter of 1948." Specific performance data are not released.

Success or failure of the new lightplane four-placers will depend largely on the untried new 145 hp. Continental engine, which presumably will go through the customary engine period of working out a series of "bugs" before it shakes down to thoroughly dependable performance. James Kinnucan, Continental vice-president, engineering, reports that all company tests thus far indicate excellent performance.

Alfredo de los Rios, left, native Chilean active in American and export aircraft sales since 1919, checks with Robert Faris, of Superior Aircraft, Wichita, changes to increase the range of his Culver Cadet, for a trip through South America.

South American Tour Is Planned in Cadet

Having nearly doubled fuel capacity of his little prewar Culver Cadet, by modifications at Superior Aircraft Co., Wichita, Alfredo de los Rios, veteran aircraft sales export specialist, is leaving soon on a four-months tour of South American countries with a dual purpose.

He plans to write a guide for private flyers which will include "every answer to flying between countries in Latin America," including facilities, service, accommodations, and attitudes of operators.

► **Sales Tour**—He also expects to represent several American aviation accessory companies in his visits to airports in the tour, which will include parts of Mexico, Central America and a complete tour around South America, skirting the coast.

A native Chilean, de los Rios has been an American citizen since 1926, when he learned to fly. He has previously been associated with export sales departments of Fairchild and Luscombe, and was the organizer of the Inter-American Escadrille, designed to promote closer relations between private flyers of North and South America. Several wings of the organization are still operating, and the guide book project will be sponsored by the Escadrille.

A total of 120 lb. was taken out of the Culver Cadet (1941 Model L) by modifications in order to make possible installation of a 15-gal. auxiliary fuel tank, behind the baggage compartment. This makes his total fuel capacity 35 gal. which is expected to give a range of up to 1,000 mi. by thinning fuel, and flying at high altitudes. A hand pump on the panel is used with the auxiliary tank. Plane's ceiling will be about 17,000 ft. and it will need about 14,500 ft. to cross the Andes mountains. His plane cruises at 117 mph. at 2,375 rpm.

► **Modifications Listed**—Modifications included removal of starter, generator, battery and radio, but plane is equipped with primary blind flying instruments. De los Rios reported after a previous South American tour in an 85 hp. Luscombe, that radio communication for aviation in Latin America was far behind that in this country.

Form Skyway 1 Group

C. S. Beesemyer, Los Angeles, has been named president of the newly formed U. S. Skyway 1 Association, Inc., formed to promote the airmarking of the transcontinental contact flyer's airway between Washington, D. C., and Los Angeles. Regional leaders in the airmarking of the skyway in states along the route, will be asked to name three representatives from each state on a Skyway 1 council, formed to coordinate the promotion of the route.

Beesemyer said that recent "erroneous rejection" of the association setup by CAA, has been rescinded, after clearing up of a misunderstanding owing to lack of full facts about the non-profit association, incorporated under D. C. law. Beesemyer is also president of the Los Angeles Chamber of Commerce. Other association national officers named are: John A. Reilly, president of the Washington, D. C. Board of Trade, vice-president; Glen B. Eastburn, Los Angeles Chamber Aviation manager, secretary-treasurer, and E. F. Colladay, Washington, general council.

Educator Urges More CAA Program Service

Expansion of CAA's aviation education service, and encouragement by all government agencies of first hand contacts with aviation in its various forms, were proposed to the President's Air Policy Commission by Dr. L. A. Bryan, president-elect of the new National Association of University Administrators of Aviation Education.

Bryan, who is director of the University of Illinois Aeronautics Institute, urged renewed emphasis on government-sponsorship of civil pilot training

in educational institutions.

Other recommendations: Increased channeling of government funds to universities for aeronautical research and experiment; full support to Air Force ROTC programs in universities with flight training in advanced courses; implementing domestic and foreign air travel by teachers and students; development of a national program of gliding and soaring for college and university students; development of sub-professional schools as sources of peacetime aviation manpower, and as quickly expandable national emergency sources of trained personnel. Location of new federal aid airports, where possible, near universities and colleges, and aid for the training of teachers in aviation classes to be conducted.

Milwaukee Field Suit

Milwaukee County board has authorized a suit against the federal government to recover Gen. Billy Mitchell Field, if the government does not terminate its lease by Dec. 31.

The lease provides that the field be returned to the county in its original condition six months after the end of the war emergency, but county officials said they had been trying for two years to negotiate termination of the lease. The county offered to waive the requirement that the field be restored to its original condition if the War Assets Administration would turn over a number of old barracks on the field to the county, which interfere with expansion of the airport. The government indicated willingness to do that, but attached other "strings" that appeared unacceptable to the county.

NFS Plans Expansion

Dick Powell, president of the National Flight System, is making a two week tour of the United States in order to expand the chain of sales agencies representing his organization.

The National Flight System is a sales organization founded to sell flight instruction on a nationwide basis through an interlocking system of sales agencies and flight operators. With distributors now being appointed in major cities, the organization eventually will have 400 agencies throughout the country.

Wolfe Named Manager

Douglas C. Wolfe, assistant manager of Teterboro Airport, has been named manager of the Chicago-Hammond Airport, Lansing, Ill. and will assume his new duties about Dec. 15. Wolfe will have charge of an expansion program designed to make Chicago-Hammond the major airfreight terminal in the Chicago area.

BRIEFING FOR DEALERS & DISTRIBUTORS

CONVAIRCAR PROSPECTS—Future of the sleek little experimental Convaircar flying automobile is being watched closely by all phases of the personal aircraft industry in view of the high hopes held by some Convair officials for its ultimate marketing. Meanwhile Convair is exploring the development cautiously in light of possible economy demands from the new (Atlas Corp.) directorate, and to avoid jeopardizing the market position of the much more conventional Stinson Voyager, best-seller in the four-place personal plane division at the present time.

ENGINEERING REPORTS—With engineering reports of the recent Convaircar crash indicating that no significant structural or aerodynamic design deficiencies were involved, way appears clear for further research. Probability is that if the flying auto eventually gets a production green light, first sales effort will be concentrated on the Crosley engine-powered automobile component as a "family second car" that can fly. Sale of the flight component with 190 hp. Lycoming engine as an airport rental unit will follow, along with some sales of complete auto-planes, but these will be secondary to major sales emphasis on the automobile, unofficial West Coast reports say. There is some opposition to the auto-plane project within Convair, by officials who contend that it will put the company into competition with the automobile manufacturers at a time when the Company's policy has been to divest itself of non-aviation interests. Proponents, led by William A. Blees, vice-president in charge of sales, anticipate that the flying auto if properly sold will do more than anything else to sell personal aviation, making it available at least to most two-car families and reaching a volume far beyond present sales. Blees' background of 20 years automobile sales executive work, in which at various times he headed the sales programs for Pontiac, Buick, Oldsmobile, and Nash, probably will weigh heavily in the ultimate Convair decision.

STUDENT PILOT INCREASE—Encouraging reversal in trend is noted in the September CAA report which shows the number of student pilot certificates issued in September 1947 was 20,339, a comfortable 10 percent increase over the figure for the same month the year before, 18,131. August CAA report showed a decrease in student pilot certificates from August 1946 figures; other aviation personnel certificate comparisons for September 1947 as against September 1946: private pilots, 13,441, as against 8,160; commercial pilots, 651 as against 1,960; airline transport pilots, 119, no figure for 1946; mechanics, 927 as against 452; ground instructors, 292, as against 196; flight instructors 532, as against 864; instrument ratings, 154 as against 436.

AIRPORT REGULATIONS REVISION—CAA airports officials have notified the American Road Builders' Association, Airport Division, that proposed revisions aimed at much-needed simplification of the airport-aid grant procedure are being developed and will be circulated shortly for comments of interested organizations and individuals. Positive suggestions for revisions of phraseology of specific sections of existing regulations will be "cordially received" by Administrator T. P. Wright, Commerce Bldg., Washington, D. C.

NEW AVIATION INSURANCE RATES—Associated Aviation Underwriters has announced an adjustment of rates for aviation insurance as the result of completion of a study of previous rate reductions, which were adjudged too drastic. Daniel Scarritt, manager, said that airplane hull coverage in the future will be written principally in the future on the basis of all risks, ground and air, with option as to whether all risks in ground includes whether the aircraft is in motion under its own power or momentum. Deductible feature has been altered to provide for 10 percent, 5 percent or 2½ percent of insured value deductible on all risks other than fire or theft. Amount of deductible will influence rate charge. Rates for medical payment coverage on certain classifications of liability policies are included for the first time in the new Associated Aviation rate chart.

LIGHTPLANE AIRMAIL—Post Office Department officials in Washington are studying the feasibility of using four-place personal-type planes for short airmail hauls. Under consideration for possible establishment early in 1948 is an experimental air mail route in the Washington, D. C., area, using four-place planes. Such routes if established would be at least partially in competition with helicopter airmail routes, bringing service to small communities with limited landing facilities.

—ALEXANDER McSURELY

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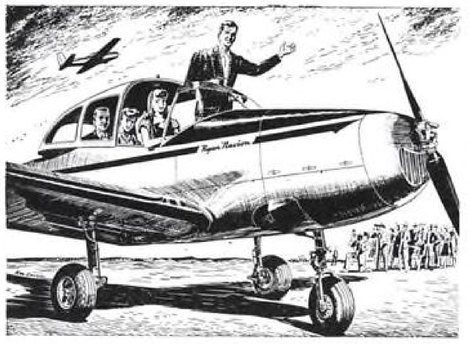

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Arens Controls, Inc.
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Carnegie-Illinois Steel Corp. (U. S. Steel Corp.)
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Curtiss-Wright Corp. (Propeller Div.)
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Henry L. Rhea Adv. Service
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Hamill Toms, Ltd.
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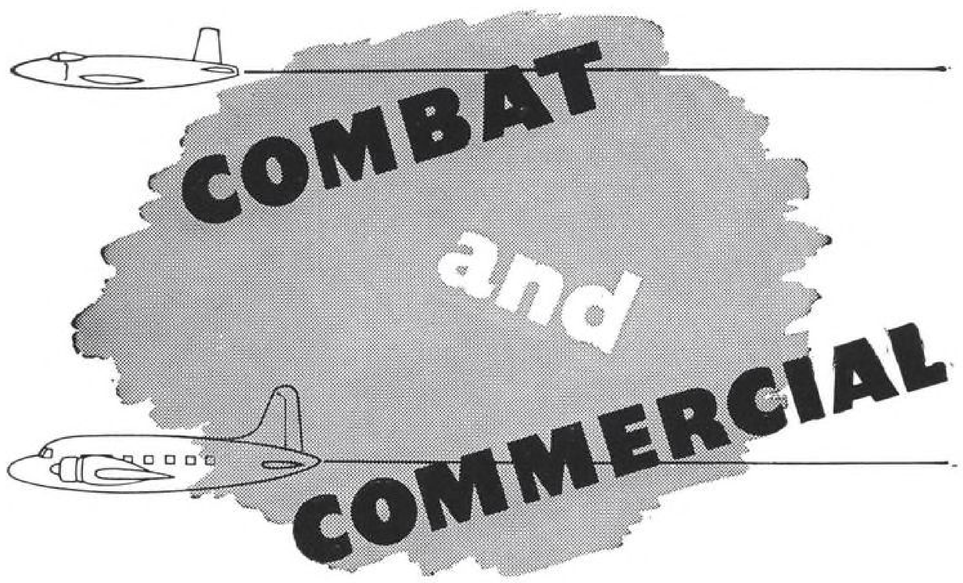

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Little Hope Seen for Surplus Cash Distribution by Aircraft Companies

Capital balances built up during war, once expected to be liquidated when reconversion demands had been met, now needed to cover operating losses.

Widespread distribution of partial cash liquidating dividends by aircraft companies has failed to materialize thus far. At the conclusion of the war, large working capital balances among the individual aircraft builders led groups of investors to believe that as soon as reconversion programs were completed and operations confined to a reduced scale, "excess" cash funds would be distributed to stockholders. This pattern was merely a hope and is a long way from fulfillment.

Curtiss-Wright Corp. is attempting to utilize its surplus cash to retire part of its capitalization. The company recently called for tenders of 500,000 shares of its Class "A" stock at $20.50 per share to exhaust $10,250,000. However, at the expiration of the first tender date of December 3, 1947, the number of shares offered was very disappointing to the company. It is reported that most stockholders felt that a much better price should have been offered as the stock is entitled to $40 per share in liquidation.

The company recently reported that it had about $60 million in "excess" working capital. Investment sources believe that additional tenders, possibly at higher prices, may be sought in the future leading to the ultimate retirement of the entire issue of Class "A" stock amounting to 1,158,702 shares.

► **Convair Distribution**—There is considerable speculation as to the eventual partial capital distribution that may take place in the reorganized Consolidated Vultee Aircraft Corp. under its new management interests. Following the pending divestment of the non-aviation properties from Convair, the surviving aircraft company should be in excellent financial condition.

For example, giving effect to this segregation, as of July 31, 1947, Convair's net current assets should be equivalent to $22.50 per share. This amount may be reduced somewhat by the subsequent losses that may occur on the company's Convair Liner project. Total net asset value was estimated at $30.25 as of July 31, 1947 and is without regard to substantial properties which have been completely amortized during the war years.

During the war, large working capital balances were developed, and at the end of 1945 a compilation of 15 leading aircraft builders showed working capital in excess of $620 million. However, inroads on such balances have been quite substantial since that time. Major additions to plant and equipment accounts have demanded large cash outlays. Deficit operations have also reduced working capital funds.

► **Table Explained**—The accompanying table reveals the composition of working capital balances as of the 1946 year-end along with the increase in property and other non-current asset accounts for 15 leading aircraft companies. A study of this table reveals the fallacy of expecting working capital funds, with a few exceptions, to be readily available for distribution as liquidating dividends, in part or whole, to stockholders.

It is interesting to note that for the 15 companies, aggregate inventories increased from 13 percent of current assets in 1945 to 36 percent at the end of last year. It is probable that a further increase may have taken place since that time. Excluding United Aircraft and Curtiss-Wright, the increase in inventories has been even more pronounced from 14 percent to more than 42 percent of total current assets at the 1946 year-end.

The current fiscal period is the last in which the aircraft industry can expect any relief from the carry-back tax provisions. Development costs and experimental charges normally charged to current operations can be offset to a certain extent by such carry-back tax credits. However, such charges may be subject to subsequent questioning and disallowances or miscalculations can prove a serious drain on the cash resources of the companies which may be involved.

Increased operating costs now demand more working capital to finance current operations than were necessary in previous years. The aircraft industry's operating costs have shown a far greater rise than most other groups. For example, the case experience of one leading aircraft builder shows that current costs compared to the 1936-1939 level are up as follows: manufacturing hourly labor rates—106 percent; tooling labor 111 percent and engineering 149 percent. Materials including engines and instruments have also more than doubled. Overhead costs have increased even more than direct costs.

► **Industry Exposed**—The aircraft industry is also exposed to the same problems now confronting all manufacturing enterprises. For example, in making replacements of property, it is frequently found that depreciation reserves accumulated out of previous years' earnings are inadequate and new capital outlays must be made.

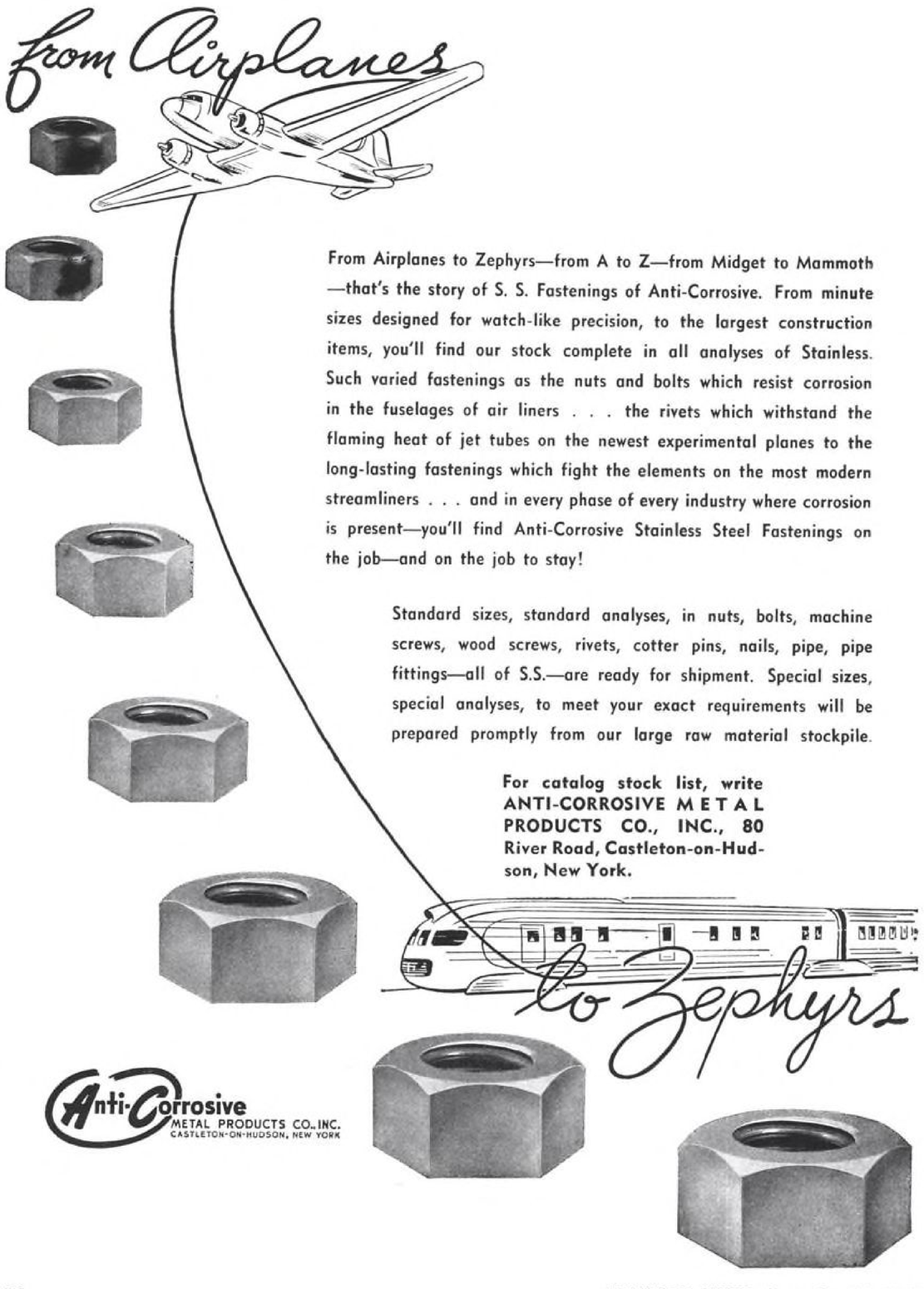
Unless the aircraft builders return to profitable operations, the prospects, for the most part, favor the gradual deterioration of working capital balances rather than voluntary liquidation. There is always that hope of again receiving orders assuring profitable volumes which encourages the builders to remain in business and attempt to hold their organizations together. —**Selig Altschul**

Working Capital and Property Accounts

Leading Aircraft Companies
(000 omitted)

	Working Capital 1946	Current Assets 1946	Inventories 1946	1945-1946 Increase Property Asset Accounts
Beech (a)	$8,924	$17,868	$11,580	$662
Bell	11,333	24,194	5,992	6,721
Boeing	43,607	70,261	19,424	1,615 (decrease)
Convair (b)	43,345	61,908	19,129	7,622
Curtiss	110,349	193,272	29,281	13,376
Douglas (b)	58,489	82,900	36,554	12,835
Fairchild E.	11,930	15,960	5,106	288
Grumman	18,949	34,009	11,059	89
Lockheed	35,653	90,036	53,056	4,967
Martin	42,485	86,311	50,230	1,353 (decrease)
No. American (a)	36,577	50,590	19,539	3,031
Northrop (c)	3,693	6,287	1,923	1,050
Republic	4,708	18,965	7,727	868
Ryan (d)	3,423	5,665	1,741	208
United	106,976	145,346	56,878	3,096

(a) September 30 (b) November 30 (c) July 31 (d) October 31



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CAB Blights Airlines' Hopes For Retroactive Mail Pay

TWA, PCA turned down in bids for more than $16,000,000 in additional compensation: United to be affected by far-reaching decision.

By CHARLES ADAMS

The hoped-for silver lining in the air transport industry's cloud of financial uncertainty vanished this month when CAB decided it lacked the power to grant the petitions of two airlines for more than $16,000,000 in retroactive mail pay.

As a result of the Board's action, TWA apparently is stuck with the $8,339,000 net loss suffered on domestic operations last year. It also loses its chance of recouping, through higher mail pay, more than $3,000,000 lost during the first quarter of 1947.

▶ **Lee Dissents**—Capital Airlines (PCA), which showed a net loss of $2,492,000 in 1946, is barred from making that deficit good through mail pay adjustments.

With member Josh Lee dissenting, CAB dismissed TWA's claim for higher mail rates which would have yielded an additional $11,157,000 for the period Jan. 1, 1946, to Mar. 14, 1947. The Board also rejected PCA's plea for about $5,000,000 additional mail compensation for the period June 1, 1942, to Jan. 14, 1947.

▶ **Law Defined**—CAB said the Civil Aeronautics Act does not give it authority to fix a new mail rate for operations during a period in which a final rate previously fixed by the Board was in effect and unchallenged. "It is a firmly established law," CAB declared, "that a public utility rate deals only with the future and is not concerned with reimbursement of past losses or recapture of past profits which have proved excessive."

TWA has been receiving 45 cents a ton mile mail pay on its domestic system under a final CAB order issued in October, 1945. On Mar. 14, 1947, TWA asked for a higher mail rate retroactive to Jan. 1, 1946. The carrier said the $3,541,000 it actually received in this 14½-month period should be increased to $14,698,358.

▶ **No Review Possible**—CAB has now informed TWA that it can not consider reexamination of the carrier's final mail rate between Jan. 1, 1946, and Mar. 14, 1947. The Board will, however, determine whether a mail pay increase is justifiable for the period after Mar. 14, 1947, the day on which TWA's petition was filed.

PCA on Jan. 14, 1947 asked CAB to reconsider the 60 cents a ton mile mail rate fixed by the Board in December, 1942. The company wanted its compensation for the period June 1, 1942, to Jan. 14, 1947, increased from about $1,700,000 to nearly $7,000,000. CAB decided it could only consider a mail rate adjustment for the period beginning Jan. 14, 1947, since no petition for a revision was on file prior to that date.

▶ **UAL Case**—United Air Lines probably will be affected directly by CAB's decision in the TWA and PCA cases. Last summer, United filed a petition asking that its present 45 cents a ton mile mail pay be boosted to $1 a ton mile retroactive to Jan. 1, 1947. In November, UAL revised its petition by asking $2.26 a ton mile retroactive to Jan. 1. To be consistent, CAB probably will be forced to throw out United's request insofar as it seeks a revision of rates prior to July 1, 1947.

CAB told TWA and PCA that the Board has always assumed that risk of loss, should rates prove inadequate, would fall upon the carriers. As a result of this policy, CAB continued, we have—in setting mail pay—allowed a rate of return commensurate with the risks that appear to be involved. "This concept of providing payment for risk in the rate of return is diametrically opposed to the principle of reimbursement for past losses."

▶ **History of Act**—There is no indication in the legislative history of the Civil Aeronautics Act that a guarantee of carriers against losses incurred under rates found fair and reasonable was intended, CAB declared.

The Board said TWA and PCA were, in effect, urging a "cost-plus subsidy plan" in place of the traditional prospective rate-making technique. Under the latter plan, CAB stated, there is a twofold pressure for economy and efficiency caused by the necessity of living within a known rate and by the prospect of being able to retain earnings which may result from the rate.

▶ **Management Responsibility**—TWA and PCA are now suggesting, CAB continued, that we assume the responsibility of making up losses incurred over a period during which their management either did not believe the rate to be an unreasonable one or, if it held such a belief, did not see fit to inform us of the fact. "On its face the suggestion asks us to put all so-called efficient managements on a cost-plus basis.

"This would be a reversal of past policies of rate fixing, for it would have a natural corollary that earnings of carriers in excess of a fair and reasonable rate would be subject to recapture. Such a policy would tend to sap management of those very incentives that are essential in a private economy if we would strive for efficiency. If the Board could at any time exercise its discretion to recoup past gains, the financial statements of the carriers would never become firm."

▶ **Filing Date Important**—CAB admit-

Forrestal Acts

Secretary of Defense James Forrestal has taken steps to minimize the number of passengers and volume of cargo carried by the Army's Air Transport Command and the Naval Air Transport Service in competition with commercial airlines.

The secretary issued an order stating that except in cases where the traffic is of official concern to the national military establishment, the armed services will not furnish transportation on a given route if CAB certifies that U. S. civil air carriers can adequately handle such business. Forrestal said the order "formalized" practices which the Army and Navy have followed in the past "through agreements and verbal understandings."

Both ATC and NATS were criticized before the President's Air Policy Commission recently by airline executives who charged that commercial business was being diverted from their companies.

ted its decision made extremely important the date of filing a mail rate petition. But the Board said it did not believe its action would, as suggested, cause all carriers to keep a "protective" petition on file at all times to prevent unpredictable losses. "Should a carrier file and thereafter earn more than a fair and reasonable return, our rate order, effective from the date of filing, would result in a reduction rather than an increase in mail pay."

In his dissenting opinion, member Josh Lee said the Board had consistently recognized that the Civil Aeronautics Act permits making rates effective prior to the date of a mail pay petition, adding that CAB had frequently exercised this power. "The rate making function of CAB under the act is entirely different from those of public regulatory bodies which fix ordinary public utility rates," Lee asserted.

Air Traffic Conference Elects 1948 Officers

Laigh C. Parker, vice president in charge of traffic for Delta Air Lines, has been elected president of the Air Traffic Conference of America for the year 1948. The airline group, consisting of chief traffic executives of all certificated U. S. carriers, handles industry matters pertaining to sales, advertising and promotion of passenger, cargo and mail business.

Other officers elected at the annual meeting in Washington, D. C., were Harold Crary, vice president-traffic and sales for United Air Lines, first vice president; and Hugh Coburn, vice president-traffic for Mid-Continent Airlines, second vice president. M. F. Redfern continues as executive secretary.

Other personnel developments:

• **Aerlinte Eireann (Irish Airlines)**—Shaun Mahoney, formerly with TWA, has become district passenger superintendent in the U. S. The Irish company plans to open service to the U. S. with Constellations early next year.

• **Capital**—James B. Franklin has been named director of operations. He was formerly director of maintenance and engineering for PCA.

• **Continental**—Ed Riederer, formerly with Mid-Continent Airlines, has been appointed manager of schedules and tariffs.

• **Eastern**—John C. Ray has become general superintendent of maintenance for the entire EAL system. Prior to his advancement he was superintendent of Eastern's engine overhaul department.

• **Pan American**—William L. Bond has been elected vice president-Orient with headquarters in Tokyo, Japan. He is resigning as vice president of China National Aviation Corp. (in which PAA holds a minority stock interest) but will continue as a director subject to CAB approval. Quentin Roosevelt has been named vice president and director of CNAC, effective Apr. 1, to succeed Bond. Roosevelt, now assistant to PAA vice president Harold M. Bixby, will have headquarters in Shanghai when he assumes his new post.

SHORTLINES

► **Alaska Airlines**—Temporary mail pay on the Anchorage-Fairbanks and Anchorage-Unalaklett-Nome routes has been fixed at $517,000 (equal to 60 cents a plane mile) for the period Nov. 1, 1945, to Sept. 30, 1947. Sixty cents a plane mile also will be paid on the routes on and after Oct. 1, 1947.

► **BOAC**—Winter schedules from New York to London call for five flights weekly—two via Prestwick, Scotland, and three via Shannon, Eire. Six flights weekly were made during the summer. . . . Because Qantas Empire Airways introduced Constellation service on the Sydney, Australia-London route this month, BOAC's Lancastrian service will carry mail and cargo exclusively.

► **Delta**—On Dec. 1 inaugurated a new sales incentive plan among employes which will last six months. Cash bonus awards ranging from 2½ to 7½ percent of their salaries will be offered to employes in offices reaching set quotas. Eligible for the bonuses are traffic managers, station managers, operations agents, ticket agents, reservations personnel, stewardesses, pursers, cargo handlers and porters.

► **Eastern**—A new-type Constellation reached a top speed of 425 mph. and averaged 375 mph. when it recently set a new commercial speed record of 2 hr. 56 min. 27 sec. on a regularly scheduled nonstop flight between Miami and New York.

► **Mid-Continent**—On Dec. 1 inaugurated service to Ottumwa, Iowa, which became the 29th city on the carrier's routes. Service to Waterloo, Iowa, is to start early in January.

► **Northwest**—Is arranging a group of all-expense tours during 1948. Trips will be made to Yellowstone Park, the arrowhead region of Northern Minnesota, Alaska and Washington, D. C.

► **Pan American**—On Dec. 10 reduced sleeper fare between New York and London from $125 to $100. The charge is in addition to the regular $325 fare for the flight. . . . Company has reduced express rates more than 33 percent on gift parcels sent to Europe and containing food or clothing.

► **Southwest Airways**—During its first year of operations, which ended Dec. 3, carried 80,100 revenue passengers, 441,500 lb. of mail, 405,000 lb. of express and 108,700 lb. of freight. Company states it carried about 35 percent of all passengers handled in 1947 by U. S. feederlines, 25 percent of the mail and 30 percent of the express.

► **TACA**—On Dec. 10 increased its DC-4 service from Miami to Havana and Central America to six flights weekly.

Freight Forwarders Endorsed at Clinic

The fifth National Aviation Clinic during its recent sessions at Springfield, Ill., endorsed CAB's proposal to permit operation of airfreight forwarders under the exemption contained in a suggested section 292.6 of the Board's Economic Regulations. Certificated airlines strongly opposed the action.

The "bill of policy" approved by the Clinic stated that activities of airfreight forwarders to date have been "highly beneficial" and probably will continue to be so. The Clinic said it was confident that CAB could check any abuses which might develop in the forwarder field. "If the growth of the airfreight industry does away with the present apparent need for forwarders, they will go out of business as an economic necessity," according to the bill of policy.

► **Fight Sidestepped**—A bill which generally sidestepped the fight between all-cargo carriers and the certificated airlines also was passed. The Clinic said airfreight should be recognized as an industry requiring new concepts, operating organizations, aircraft, safety and economic rules and regulations specifically adapted to the business.

Originally, the bill termed airfreight a "separate" industry, but the word "separate" was deleted. Another bill, which was not approved, stated that airfreight should be carried only by companies holding certificates of public convenience and necessity specifically authorizing the transportation of airfreight as distinguished from express and property.

CAB SCHEDULE

Dec. 15. Hearing on PCA's application for unrestricted service from Chicago to Cleveland, Akron, Youngstown and Pittsburgh. (Dockets 1789 and 1790.)

Dec. 22. Hearing on revocation of American International Airways' letter of registration as irregular carrier. (Docket 3167.)

Jan. 5. Hearing on Mid-Continent's application for alternate Kansas City-New Orleans route. (Docket 1956.)

Jan. 5. Hearing on Board's investigation of Consolidated Airfreight Tariff Agreement. (Docket 2719.)

Jan. 15. Hearing on requests of Braniff and Chicago & Southern for removal of restrictions on Chicago-Houston service. (Dockets 1681 and 1798.)

Jan. 20. Hearing on Taca, S. A., foreign air carrier permit renewal and amendment case. (Dockets 3016 and 3017.)

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

Feb. 16. Hearing on St. Louis-Twin Cities route applications of Eastern Air Lines and Mid-Continent Airlines. (Dockets 1050 and 2151.)

Feb. 16. Hearing on additional service in New England Area. (Docket 1279 et al.)

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

UAL Offered Aid At ATA Meeting

Offers of support for strike-threatened United Air Lines, moderate budget trimming, and calls for repeal of federal transportation taxes on persons and property and amendment of the Railway Labor Act marked the annual meeting of the Air Transport Association this month.

Airline heads reportedly offering to back UAL President W. A. Patterson in his dispute with the Air Line Pilots Association included Eastern Air Lines President E. V. Rickenbacker, TWA President La Motte T. Cohu and American Airlines Board Chairman C. R. Smith. Several executives proposed buying advertising space to support UAL's case in the event of a strike.

► **Budget Trimmed**—ATA's budget for the first half of 1948 was set at about $360,000, around $20,000 less than the budget for the same 1947 period. The association's officers, including Emory S. Land, president; Robert Ramspeck, executive vice president; and Milton W. Arnold, vice president-operations and engineering, were reelected.

One bill on the meeting's agenda sought amendment to the Civil Aeronautics Act to tighten regulations governing contract air carriers. Another bill dealt with amendment of the Act with respect to federal and state jurisdiction over regulation of civil aviation. Among other things, the latter bill proposed uniform regulation of air navigation and air transportation throughout the nation, with the states and territories keeping hands off matters already covered in the Civil Aeronautics Act.

► **Exemption Power**—A proposal to limit CAB's powers to grant exemptions is being given further consideration by ATA. The certificated airlines want Congress to remove the Board's broader exemption powers (such as the ability to exempt nonscheduled carriers, all-cargo carriers and freight forwarders from the certificate provisions of the Civil Aeronautics Act) but want CAB to retain the right to issue exemptions where competitive issues are not involved.

New members elected to ATA's board of directors at the close of the annual membership meeting were T. C. Drinkwater, Croil Hunter and Robert J. Smith, presidents of Western, Northwest and Pioneer Air Lines, respectively. Holdover directors are W. A. Patterson, president of United Air Lines; E. V. Rickenbacker, president of Eastern Air Lines; C. R. Smith, board chairman of American Airlines; Juan Trippe, president of Pan American Airways; C. E. Woolman, president of Delta Air Lines, and La Motte Cohu, president of TWA.

AA to Boost Fares

Opposition to a second-round 10 percent passenger fare increase crumbled early this month when American Airlines joined the move to lift tariffs to about 5½ cents a mile. The higher rate was to become effective throughout American's system last week.

Steadily rising costs plus grounding of the DC-6s for a considerably longer period than had been anticipated broke down American's stand against the increase. Late in November, when American was holding out against the fare hike, it was expecting to have its DC-6s back in operation before Dec. 15.

Eastern Air Lines and National Airlines planned to follow American aboard the bandwagon with higher fares becoming effective Jan. 15. Only trunkline failing to seek a fare increase during the past three months is Colonial, whose rates have been above the 5 cents a mile level for some time.

Northwest Employes Get 15½ cent Boost

Fifteen hundred ground employes of Northwest Airlines will get a 15½-cent hourly wage increase, retroactive to July 1, under an arbitration award handed down by a panel headed by William M. Leiserson, former chairman of the government's National (Railway) Mediation Board.

This and 13 other adjustments agreed on unanimously by the tripartite panel will be contained in the second contract signed with Northwest by the International Association of Machinists (Ind.) covering mechanics, kitchen personnel and other ground forces.

► **Pension Plan**—The union also negotiated an 8-cent, third-round wage boost, improved sick leave benefits and a pension plan with Eastern Airlines. The company, the union said, will pay 65 percent of the entire cost of the pension.

Dr. Leiserson explained to AVIATION WEEK that the 15½-cent increase at Northwest was agreed on by the panel on the basis of a number of factors, including increased cost of living, comparative rates of similar work within and outside the industry, ability to pay and the union's request for restoration of weekly purchasing power to what it was in 1942 under a 48-hour straight-time week.

K. R. Ferguson, NWA vice president, and George H. Pedersen, IAM official, concurred with Dr. Leiserson in the decision, which also granted:

• **Three weeks paid vacation** after 10 years of service. Employees also get two weeks after one year.

• **Seventh holiday** (Washington's birthday) with pay.

• **Increase in shift premium** from 4 to 5 cents on afternoon shift and from 8 to 10 cents on night shift.

Vacation, holiday and shift adjustments are effective next Jan. 1. Starting salary of flight mechanics stationed outside the country was fixed at $350 a month, increasing $25 every six months to a level of $450 after two years.

House Groups Begin Study Of Mail Rate Problems

House Post Office Committee plans a double-barreled investigation of airmail postal operations.

Hearings before the Committee's airmail subcommittee, conducting the primary investigation of airmail payments to carriers and airmail postal rates, was scheduled to get underway last week with testimony by non-scheduled carriers. Robert Prescott, president of the Flying Tiger Line, was the first witness. The subcommittee's chairman, Rep. Edward Rees (R., Kans.), has looked approvingly on non-scheduled airline offers to carry the mails below the rates paid to scheduled carriers.

While Rees' subcommittee on airmail operations moved forward, however, another subcommittee of the Post Office Committee, laid the ground work for an investigation which will have a major bearing on the airmail postal service. The subcommittee, headed by Rep. Katharine St. George (R., N. Y.), will consider the desirability of establishing an independent postal rate-making authority. Prompting the appointment of this subcommittee was the fact that although the Post Office Department must make mail payments, it has no decisive voice in determining payment rates, set by the CAB and the ICC.

Gardner New President Of Northeast Airlines

George E. Gardner, formerly executive vice president of National Airlines, has been elected president and chief executive officer of Northeast Airlines. He succeeds Paul F. Collins, who will continue as chairman of the board of directors.

M. H. Anderson was reelected vice president of the company, and L. W. Miller was named vice president and treasurer. At the same time, stockholders approved a financing plan to raise more than $2,000,000 for Northeast.

Behncke Offers Safety Formula

ALPA president tells Policy Commission of need for Bureau of Standards.

David L. Behncke, president of the Air Line Pilots Association, took his case for an independent air safety board to the President's Air Policy Commission this month and rounded out his testimony with pleas for a Bureau of Standards for Air Safety and a liberal pilot pension plan.

Under the present arrangement, with the Safety Bureau part of CAB, there is a definite tendency on the part of the people who do the regulating not to blame themselves when accidents occur, Behncke told the Commission. He added that pilots have become the scapegoats in too many mishaps and inferentially defended the American Airlines' pilot whose tampering with a gust lock sent a DC-4 into a 7,500 ft. dive over Mount Riley, Tex., on Oct. 8. This incident, the union president declared, "could have been averted had the plane been equipped with a properly designed gust lock arrangement."

► **Facts Requested**—Pressed by Commission Chairman Thomas K. Finletter for facts to support his statements against the present safety setup, Behncke said he would submit documented evidence showing that the Independent Air Safety Board (which was in existence from August, 1938, to June, 1940) was more efficient in investigating accidents than the existing CAB Safety Bureau. He emphasized that there were no airline fatalities during the 17-month life of the Independent Air Safety Board, whereas 880 persons were killed in airline transports and 136 injured from June, 1940, when the Independent Board was abolished, to Oct. 26, 1947.

Asked to make a choice between keeping the status quo, with the Safety Bureau in CAB, or shifting it to CAA, Behncke said he preferred leaving it in CAB if it could not be made independent. He added that if an independent board is created it should be made responsible only to Congress.

► **Stalling Speed Limits**—The ALPA president charged that air safety took "the worst beating in the history of air transportation" when the pilots lost their battle to establish a top fixed limit on stalling speed for transport planes. Because the fixed top limit on stalling speed was eliminated, the airlines today are looking to Rube Goldberg devices and excessive braking action in an effort to bridge the gap between the inadequacy of our airports and the "hot" performance characteristics of the planes, Behncke asserted.

Heavier wing-loaded planes, which require more space to maneuver, resulted from the destruction of a fixed top limit stalling speed, he continued. The union chief offered the following table of wing loading progression on transport planes between 1932 and 1947:

Aircraft	Date	Wing Loading (lb. per sq. ft.)
Boeing 247	1932	16.3
Douglas DC-1	1933	18.5
Douglas DC-2	1934	19.2
Douglas DC-3	1936	25.5
Lockheed Lodestar.	1937–42	32.9
Martin 2-0-2	1947	44.2
Convair 240	1947	44.8
Douglas DC-4	1942	50.1
Constellation	1945	61.8
Douglas DC-6	1946	63.7
Stratocruiser .....(Pending)		73.6

Turning to his proposal for a Bureau of Standards for Air Safety, Behncke intimated that the recent DC-6 fires might not have occurred if all devices on the planes had been put through sufficiently exhaustive tests. He said the new Bureau of Standards should pass on every component part which goes into the construction of each type of airline transport.

► **Work Defined**—"It should independently approve the structural requirements of all aircraft and the compression, torsional and tensile strengths of all the metal, wood and plastic components and appurtenances which are part of a plane's structure. Grueling investigation and destruction testing under Bureau supervision should be applied to every electrical part, to all radio instruments, electric motors, and switches, to the wiring, insulation, and fireproof characteristics of upholstery and carpets."

Behncke said institution of industry-wide pilot pension plans developed along the same lines as the Railroad Retirement Act cannot be delayed. Pilots and the companies would each contribute 50 percent of the cost. He added that he had no reason to expect any cooperation from the airlines on the retirement program and indicated the pilots might have to use considerable pressure to gain their goal.

At present, the only certificated airlines with pilot retirement systems are United, Pan American, American, Braniff and Eastern. Behncke said that in all five cases the plans were formulated without the pilots' knowledge. He added that the existing pension programs are inadequate, with the retirement age of 60 too high considering the pilots' short working span.

Uncertificated Lines Facing Court Tests

Three uncertificated airlines were facing Federal Court actions last week as CAB sought to restrain them from carrying passengers overseas in alleged violation of the Civil Aeronautics Act.

Defendants in the suits are Pacific Overseas Airlines, Ontario, Cal.; Ocean Air Tradeways, Glen Cove, N. Y.; and Winged Cargo, Inc., Philadelphia.

Pacific Overseas, which uses C-54s, has a letter of registration to fly cargo only on a scheduled common carrier basis to points in the Pacific, including Guam. CAB seeks to enjoin the company from carrying either passengers or cargo as a common carrier to Europe and other points not listed in its letter of registration.

Ocean Air Tradeways, a non-scheduled carrier, has been making what CAB considers to be unauthorized passenger flights to Europe with a C-54. Winged Cargo's DC-3s have been flying passengers to Nassau in the Bahama Islands and San Juan, Puerto Rico. CAB seeks to eliminate the Nassau service altogether and curtail the San Juan operations to less regular basis.

As in CAB's action against American International Airways, whose Boeing 314 flying boat was forced down in mid-Atlantic in October, the three companies cited most recently by the Board may argue that their passenger-carrying flights are under charter or contract and thus outside the Federal agency's jurisdiction. CAB contends the companies actually are offering common carrier services.

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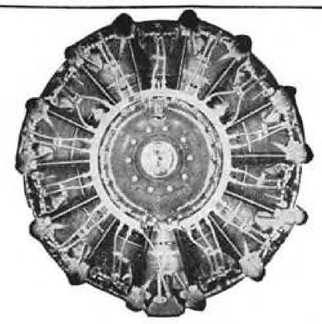

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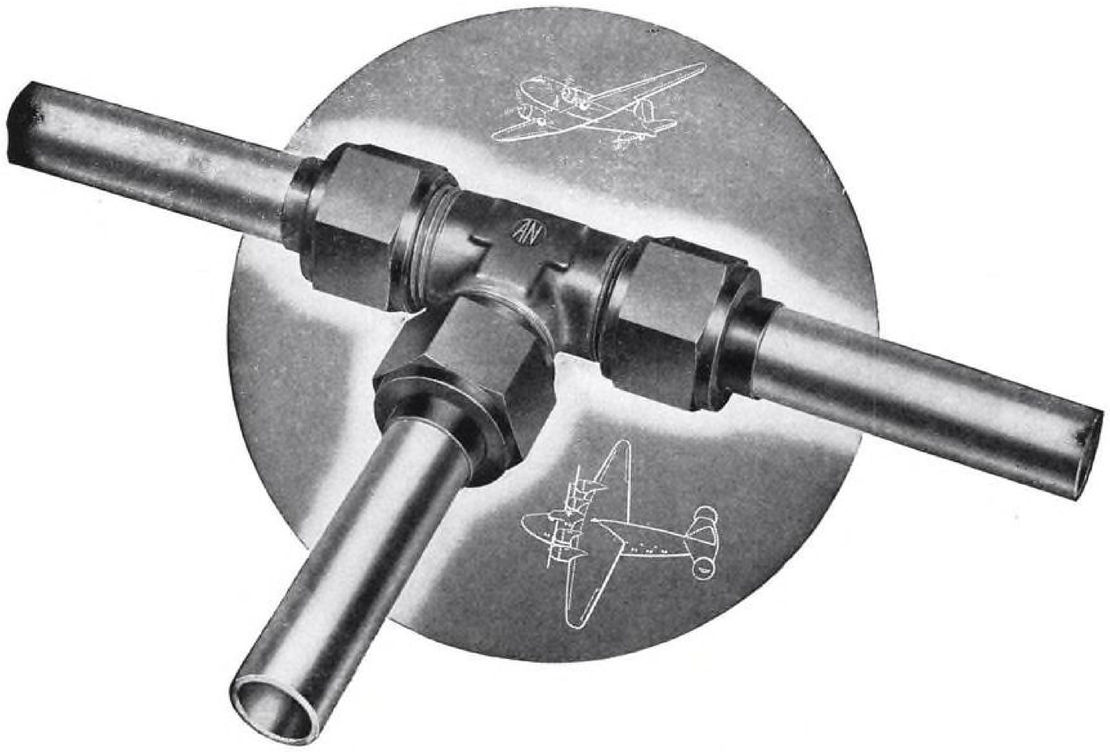

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LETTERS

Fire Fighting Problems

To the Editor:

Committee on Aviation and Airport Fire Protection has been interested in the various reports on the United Air Lines DC-4 accident at LaGuardia Field May 29, especially your very effective review of the CAB report in AVIATION WEEK Sept. 29. . . .

The local New York press and Time magazine gave considerable distortion of the facts regarding the rescue work and this publicty reflected unfavorably on the efficiency of the crash crew which performed admirably under the severe limitations imposed by the nature of the crash and the fire condition existing at time of their arrival. . . . We believe this particular accident is important because from all we can determine none of the 43 persons . . . met their death because of impact injuries. . . .

We think it is particularly important to establish the following facts:

1. This accident was anticipated before it occurred by a fireman on duty at the airport crash station.

2. The first unit of fire equipment reached the scene within 50 seconds.

3. The two major crash units (Army 155) were driven to within 25-ft. and 35-ft. of the crashed aircraft. The high pressure water deck guns on one of these trucks were placed in service while the vehicle was still approaching and swept the flames away from the tail section.

4. Three hand fog lines covered rescue men as they entered the rear utility door through burned out portions of the fuselage, and through openings cut into the aircraft by forcible entry tools.

5. Firemen (not bystanders) removed nine passengers in the crucial seconds while the pilot escaped unassisted. Press reports crediting a bystander for rescue work have not been substantiated. Five of those rescued who died in the hospital later succumbed due to burns.

6. The small crash units (Army 125) were employed to provide additional fog lines to protect rescue operations and a fifth unit supplied foam for holding down the heat and flame. Two thousand pounds of dry foam powder were used by this latter vehicle.

7. A 2,500-gal. water tank truck replenished the water supply of one of the major units mentioned in No. 3 above. . . .

Perhaps it would be well to mention some of the handicaps for the aeronautical engineers to consider. They are:

1. Total of 1,300-gal. of gasoline plus flammable hydraulic fluid, oil and alcohol which were immediately ignited at time of impact.

2. The reflashing of gasoline following temporary extinguishment due to burning hot metal parts.

3. Ignition of synthetic leather upholstery within the cabin area.

The swampy terrain was an added feature which acted as a severe handicap in this particular accident.

GEORGE H. TRYON, III, Secretary
Committee on Aviation & Airport Fire Protection
National Fire Protection Assn.
Boston, Mass.

Beech Stall Indicators

To the Editor:

I particularly enjoyed your editorial on stalls, and think it is not only timely but just plain horse sense. However, as a Beech dealer I would like to take exception to your statement that Dr. Greene's gadget is the only "recognized stall warning device on the market." In case you do not know it, every Bonanza sold to date, and they now number more than 1,000 in service, has installed as standard equipment a stall warning indicator similar to the Safe Flight Indicator.

As an incidental outgrowth of this safety move, the rumor got around that the stall warning had to be installed because the ship had a particularly vicious stall. This is in no sense the truth and I have had several customers express amazement when I disproved the rumor by demonstrating conclusively to them that the Bonanza's stall was in fact quite gentle.

This may explain in part why some manufacturers have hesitated to install the Safe Flight Indicator, but it reflects greater credit on Beechcraft for being willing to make this contribution to flying safety.

SAMUEL FREEMAN, President
Somerset Air Service, Inc.
Far Hills, N. J.

ADVERTISERS IN THIS ISSUE

AVIATION WEEK—DECEMBER 15, 1947

SEARCHLIGHT SECTION

(Classified Advertising)

Air Safety Progress

CAB's accident report on the emergency landing of an American Airlines DC-3 at Jones Beach, N. Y., on the night of Jan. 5 serves as an excellent yardstick to measure one phase of air safety since that snow-filled night.

Pilot John Booth set his ship down by the light of a magnesium parachute flare less than 10 miles from LaGuardia Field where he had departed some five hours before. He spent that time milling around an airways system that had come apart at the seams under the double stress of unforecast bad weather and heavy traffic. Another DC-3 operated by a nonscheduled carrier crashed near Millville, N. J., the same night, with fatalities, due to the same basic circumstances.

That night there were four Air Force and Navy operated GCA sets that might have been used to relieve the 18 emergencies declared along the N. Y.-Washington airway during the period pilot Booth was being shunted about without radio range reception and misled by false weather reports. Not until after Booth had declared an emergency did anybody—then it was American Airlines and not CAA's airways traffic control center—try to alert Navy GCA at Floyd Bennett.

Now we find CAA-operated GCA at Chicago, New York and Washington turning in an average of 250 practice approaches a month at New York and Washington, 650 at Chicago, with nearly a dozen actual operational "saves" of aircraft to their credit. Most recent "saves" include a private DC-3 landed by GCA at Chicago on Nov. 13 after 2 missed instrument approaches with 400 ft. ceiling and three-quarters mile visibility. Private Lockheed and Beech ships were handled by GCA on the same day after the field closed below minimum during missed range approaches.

An agreement between CAA, airlines, the Air Force and Navy has made common frequencies available to military GCA units and civilian planes so these facilities can be used by all for emergencies. Numerous planes have been saved by these facilities since the Jones Beach fiasco, the most recent being a non-scheduled airfreighter landed by the Navy GCA at Columbus after the field went below CAA minimum.

At New York and Washington long range search radar is operated by Airborne Instruments Laboratory and the Air Force respectively. This provides 125 mile coverage around these heavy traffic density areas and is of great assistance in locating lost planes, checking locations of traffic stacks and supplementing GCA in emergencies.

Now, the situation the AA plane found itself in could not be repeated, thanks to these new facilities on the New York-Washington airway.

Credit is due many men who helped make this possible. Among them are Milton Arnold and Dusty Rhoades of ATA; Hector Skifter and John Dyer of Airborne Instruments Laboratory, Gen. Harold M. McClelland of the Air Force, Airways and Air Communications Service, Admiral Reeves of the Navy, Jim Smith of Pan American, and Jack Frye, late of TWA, and such hard working missionaries as Dave Callahan of Gilfillan.

Dependable Transport

Naval Air Transport Service celebrates its sixth year this month with an outstanding record in air transportation. Under its founder, Capt. Dutch Schildhauer, and Rear Admiral John W. Reeves, Jr., its commanding officer for the past three years, NATS reliability and safety have reached unprecedented peaks.

The latest figures available show that NATS in its four-engined equipment alone—DC-4s and Martin Mars—has flown 1,867,360,000 passenger miles without a single passenger fatality since it was organized. Its entire fleet of 115 planes, both twin and four-engined, flew 370,210,334 passenger miles in the first 11 months of 1947 without a fatality.

Whereas NATS once set as its goal the safety record of the U. S. airline industry, in 1946 it virtually equalled that record with 1.8 fatalities per 100 million passenger miles, against 1.6 for the industry, and so far this year, with no fatalities, it surpassed the commercial rate of 5.2.

During 24 days of below-minimum weather in the Washington area last winter NATS canceled 18 percent or 58 of 323 schedules, while four airlines canceled 45 percent or 1,836 out of 4,054.

At present there is a bitter battle raging in Washington between NATS and the Air Transport Command, with Air Force Secretary Symington and the Navy's Secretary John L. Sullivan as the principals. In brief, the tangle stems from the fact that while a Presidential Executive Order gave NATS to the ATC, the unification law, dated later, authorized the Navy to retain its air lift.

We must side with the Navy in this one. The last conflict proved that wartime need for air transport inevitably and invariably exceeds the supply. NATS should be allowed to continue as a yardstick for both ATC and the industry, on a modest peacetime basis. In addition to its value as a training aid, and as an operation-in-being, it offers the only apparent hope that this country will be able to continue development of the flying boat which, in light of some new technical findings, may have an important future in the jet era. In this respect, certainly, NATS could hardly be accused of duplicating the ATC.

If the commercial airlines hold to their frequent claim that NATS is competitive, there seems no valid reason for the Navy's refusal to review the regulations governing acceptance by NATS of passengers and property.

The outstanding accomplishments rung up by NATS entitle it to survival, from the standpoints of both national defense and an efficient air transport system. We shall gain more from NATS as a separate service.

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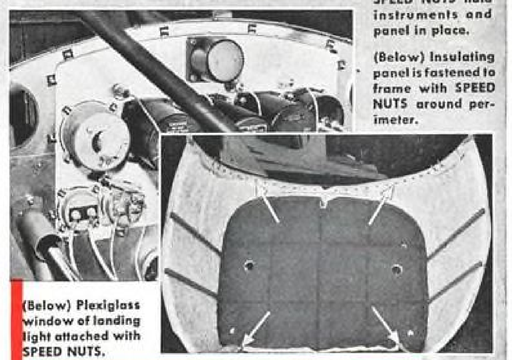
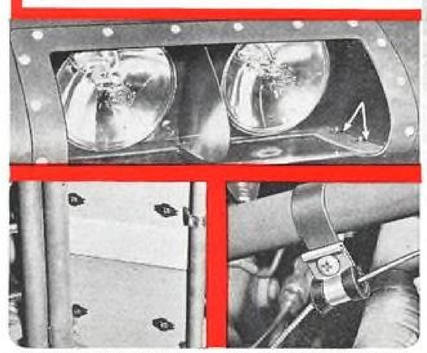


(Left) "U" type SPEED NUTS hold instruments and panel in place.

(Below) Insulating panel is fastened to frame with SPEED NUTS around perimeter.

(Below) Plexiglass window of landing light attached with SPEED NUTS.



Showing SPEED NUTS for plywood on bottom of floor board.

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