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SEPT. 8, 1947

INCORPORATING AVIATION AND AVIATION NEWS

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INCORPORATING AVIATION AND AVIATION NEWS

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THE AVIATION WEEK

BATTLE OF ENGINES—The toughest Thompson Trophy Race in national air race history was primarily a battle of engines. Cook Cleland's two record breaking Goodyear F2G-1's were powered with the 28 cylinder Pratt & Whitney Wasp majors rated at 3,500 hp. with a 4,360 cubic inch displacement. Their closest competitor, the Bell P-39 piloted by ex-Bell test pilot Jay Demming, was powered by an Allison V-1710 rated at 1,425 hp. with less than half the Wasp major's displacement.

Demming was first off the ground and held the lead for four laps before superior engine power put the former Navy planes out in front to stay. Even with the power deck stacked against him Demming kept his P-39 on the tail of the second place F2G all the way averaging 389 mph.,—16 mph. faster than Tex Johnston's winning time in the same plane last year.

NAVY VICTORY—Cook Cleland's flyer in Goodyear Corsair operations was strictly a Navy triumph and was so interpreted by the sea-going contingent at the races. Cleland who is now a Cleveland fixed base operator, was a Navy dive bomber. Richard Becker who flew the second place Corsair was a Navy test pilot at Patuxent and is now chief mechanic at Cleland's airport. Tony Janazzo who was killed flying Cleland's third Corsair was a former Navy fighter pilot.

Cleland's Corsairs were part of an experimental Navy order for 10 and were made by Goodyear at its Akron aircraft plant. The planes were completed in the fall of 1945. They grossed 15,000 lb. in comparison with 9,000 lb. for the Chance Vought Corsairs.

PAPER FIGHT—Navy also trotted off with honors in the public relations skirmish. AAF show was originally built around Col. Albert Boyd and the Lockheed Shooting Star (P-80R) as holders of the world speed record and lost much of its punch from the hasty revamping necessitated by the record breaking Douglas D-558 performances less than two weeks before the races. Mush mouthed drawl of Col. Robert "God Is My Co-pilot" Scott on the public address system also helped to slow the pace of the AAF performance. Navy exhibited all types from Grumman Bearcats to McDonnel Phantoms in a snappy acrobatic parade punctuated by simulated dive-bombing and strafing attacks, TNT bomb explosions, air raid sirens and chattering anti-aircraft fire that literally jarred the crowd onto the edge of their seats.

BATTERED JETS—AAF fighter pilots in Lockheed Shooting Stars took top honors for the most rugged performance on the racing program. Competing for the Jet Thompson Trophy they swished around the 15 mile course at better than a 500 mph. clip that saw several planes and pilots take more than 12g's on the pylon turns. One P-80 smashed through a flight of birds that tore off part of the canopy, battered a wing and fouled the air duct. Other planes had bent spars, buckled fuselages, popped rivets and dented wings to show for the terrific grind that battered the pilots as hard as their planes.

RACING FUTURE—Stirred by the four crashes in the reciprocating Thompson race that killed one and injured two other pilots, the National Racing Pilots Association met in Cleveland after the races to deliberate on the future of closed-course racing. Many feel that the pace of current jet and piston planes is too fast for the 15 mile squirrel cage laps of the Thompson course.

Despite a violent thunderstorm that washed out the opening day's program attendance reached 138,000 for the two remaining days assuring continuance of the races for at least another year. Thompson Products president Fred Crawford, who also heads the air race management, indicated races will be continued on a year to year basis depending on success of each year's performance.

MANUFACTURERS PLEAS—Aircraft manufacturers are preparing strong pleas on the importance of their individual roles in the national defense picture for President Truman's Air Policy Commission when it makes its transcontinental survey of manufacturing facilities next month. Tentative schedule calls for visits to Wright Field, Kansas City, San Diego, Los Angeles, Moffett Field and Seattle beginning Oct. 6. Some manufacturers not being visited are highly concerned over lack of opportunity to tell their story. Actually the tour and the commission will have little to do with determining survivors in the industry. Main purpose of the trip is to acquaint commission members, most of whom have never seen an aircraft plant, with the industry and military aviation generally. Final word on which manufacturers are to be kept alive by Air Force and Navy contracts still rests with the military not the civilian commission.

SECURITY AND CENSORSHIP—Army and Navy are putting pressure on some segments of the aircraft industry to send representatives to top officials of McGraw-Hill Publishing Co. to make a protest about AVIATION WEEK and "violations of security." This magazine does not restrict its grist to Army and Navy sponsored press releases. Public relations people among Eastern manufacturers have shown more signs of giving in to Army and Navy wishes, and have asked Western members of the National Public Relations Advisory Committee of AIA to discuss the matter. Western manufacturers so far have shown little enthusiasm for participating in the protest. The matter is important, not because it is this publication which is involved, but because it may be another indication that the whole subject of peacetime censorship will break out into the open, involving the nation's press generally.

NEWS DIGEST

DOMESTIC

John R. Alison, Assistant Secretary of Commerce for Aeronautics, was sworn in as a member of the National Advisory Committee for Aeronautics.

Rear Admiral Lawrence B. Richardson (ret.), and Joseph F. McCarthy were elected vice presidents of Curtiss-Wright Corp. Richardson retired last year as asst. chief Bureau of Aeronautics.

Frank Cuccia, former Cadillac salesman and Marine Corps veteran, was appointed director of procurement for Glenn L. Martin Co. Cuccia has been at Martin for last three years as AAF plant clearance officer.

Don Pollard, 23-year-old Roanoke (Va.) glider pilot, won Northeastern states soaring championship at Elmira, N. Y. He flew French glider to collect $490 in altitude and distance awards.

Walter C. Jamouneau was appointed secretary and asst. treasurer for Piper Aircraft Corp. He replaces W. T. Piper, Jr., who returns to his sales department duties.

Delta Air Lines and Air France have signed interline agreements covering reservations on either line from 30 U. S. cities served by Delta and 53 countries on five continents served by Air France.

John D. Kay, U. S. Coast and Geodetic Survey, was appointed CAA assistant to the administrator for aeronautical charts. New post will maintain liaison between two agencies on aero chart matters.

FINANCIAL

DeHavilland Aircraft of Canada, Ltd. has increased its capitalization from 25,000 to 50,000 shares of class "A" and from 5,000 to 10,000 shares of class "B" stock.

Boeing Aircraft Co. reports net profit of $64,280 for six months ended June 30 after $70,000 tax refund. Sales were $10,537,268 and backlog stands at $226,557,117.

Northrop Aircraft, Inc. reports profit on fiscal year ending July 31 with total working capital at $3,200,000. Backlog now stands at about $22,000,000 largely for XB-35 and YB-49 contracts.

North American Aviation, Inc. reports net income of $303,847 for nine months ended June 30 after $4,260,500 in carryback credits.

FOREIGN

Indian independence divides Royal Indian Air Force into seven fighter and one transport squadrons for Hindustan and one fighter and one transport squadron for Pakistan. Fighters are Hawker Tempests and transports are Douglas DC-3s.

Roy Chadwick, A. V. Roe chief designer, was killed in Tudor II crash following takeoff from Woodford, Cheshire. Chadwick designed famed Avro Lancaster and some 30 other British aircraft.

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INCORPORATING AVIATION AND AVIATION NEWS

Heavy Accident Toll Weighs Against National Air Races

New speed records set as Mantz wins Bendix, Cleland takes first in crash-ridden Thompson; jet marks climb.

By ALEXANDER McSURELY

Thrill-seeking cash customers received their money's worth in speed and crashes at the 1947 National Air Races at Cleveland but the industry is still debating whether the colorful big show made sufficient real contributions to advancement of aviation to compensate for the serious damage done by the emphasis on danger and death. The home-town Cleveland Plain Dealer, told its readers next morning in a huge double eight-column headline: "Pilot killed, three others crash in Thompson race won by Cleland."

► **Effect Harmful**—Harmful effect of many such news stories on the aviation industry as a serious transportation business is undoubtedly enhanced rather than diminished by the glamorous show background. Logic of continued widespread industry participation in a spectacle whose conditions often invite widely-publicized air crashes is up for serious weighing. On the credit side of the 1947 National Air Races, the Goodyear Trophy races for midget planes with 85 hp. engines stood first as an undoubted stimulant to new and original design features many of which will be applicable to the commercial light plane. The clean safety record of the eight Goodyear heats indicated that the plane specifications and race requirements had been well-planned. As a result of this year's success the second year Goodyear races will probably have more entrants and will generate more new design features. Suggested changes in Goodyear requirements include; raising the present 190 cu. in. piston displacement limit slightly so that stock engines from other manufacturers besides Continental may be used; changing the location of the course so that all the race will be run in front of the grandstands; setting a deadline for completion and flight testing of race planes well in advance of actual race time.

► **Power Decides**—Power and tight 15 mile course were the deciding factors in the $40,000 Thompson Trophy race as the first and second finishers piloted Corsair F2G fighters powered with Pratt & Whitney 4360 Wasp major engines developing

Bendix Trophy

close to 4,000 hp. Cook Cleland, operator of Willoughby airport, east of Cleveland, and Navy dive-bomber pilot in World War II set a new record of 396.131 mph. for the 300 mi. race, as compared to the fastest winning time of previous races, Tex Johnston's 373.908 average last year. Richard Becker also of Willoughby, flying a sistership also owned by Cleland, averaged 390.166 mph., only slightly ahead of the third place winner, Jay Demming, Niagara Falls, N. Y., in Cobra II, a Bell O-39 Airacobra with an Allison V-1710 engine, the same plane which Johnston flew in his 1946 victory. Demming managed to get 389.837 mph. out of his Cobra II, approximately 16 mph. faster than Johnston had flown it the previous year to win. Tony LeVier, last year's second place Thompson winner, placed fifth this year in his red Lockheed P-38, finishing behind Steve Beville, Hammond, Ind., who was flying a North American P-51 powered by Packard-Merlin. Beville's time was 360.840 mph. and Levier's, 357.488. The only other finisher in the Thompson was William Bour, in an Allison-powered Bell 0-63 with 327.280 average.

► **Jannazo Dies**—A third Wasp major-powered Corsair in the Cleveland team carried its pilot, Tony Jannazo, of Cleveland, former Navy flyer, to his death in the seventh lap, when he flew into the ground shortly after rounding No. 2 pylon. It was the third fatality in Thompson race history. Three other planes crashed in the race;

• **Woody Edmundson,** Lynchburg, Va., airport operator and well-known stunt flyer, crash-landed his North American, A-36;

• **J. L. Ziegler,** Kenmore, N. Y., pilot of a Curtiss P-40-Q, parachuted from his plane, in the 14th lap, in full view of the grandstand. He suffered a broken leg and a woman spectator on the ground was struck on the head by a canopy, believed to have fallen from his plane.

• **Jack Hardwick** of Arcadia, Calif., crash-landed his P-51 when the engine quit shortly after the "race horse" start in the first lap. A shoulder harness apparently saved him from injuries except for a bruised elbow, when he belly-landed the plane in a field, narrowly missing other spectators who pulled him from the wreckage.

Other crashes during the National Air Races and qualifications brought the total up to nine, believed to be the largest number of serious mishaps in any single air race. Three pilots parachuted from planes during qualifications; James Ruble, Houston, Tex., parachuted from his burning Lockheed P-38 in Arizona, in The Bendix cross-country speed dash, and Dori Marland, Pacific Palisades, Calif., woman flyer in the Halle race crash landed her North American AT-6 in a field near the Cleveland airport. None of these flyers were seriously injured.

► **Mantz Repeats**—Paul Mantz, Hollywood motion stunt flyer, repeated his 1946 Bendix race triumph in 1947 by a narrow one min. 17.6 sec. margin over second-placer Joe DeBona, Beverly Hills, Calif. Mantz flew his red North American P-51, Packard-Merlin Powered for a new record of 460.423 mph., for the 2,045 mile flight to win the $10,000 first Bendix money.

Other Bendix times; DeBona, 458.203 mph.; Edmund Lunken, Cincinnati, third, 411.456 mph.; Bruce Gimbel, Greenwich, Conn., fourth, 404.080; William Eddy, La Jolla, Calif., 376.849.

Other race results:

Goodyear Trophy Finals; William F. Brennand, Oshkosh, Wis., Steve Wittman Special, 165.857 mph.; Paul E. Penrose, North Hollywood, Art Chester's Sweet Pea Special, second, 165.393 mph.; H. R. Salmon, Van Nuys, Calif., Cosmic Wind Special, 158.798 mph.

Bendix Race Service Jet Division: Col. Leon W. Gray, Casa Grande, Ariz., 503.123

mph., exceeding his last year's first place time of 494.779 mph. Other service pilots landed at Patterson field, due to storm condition at Cleveland.

Thompson Service Jet Division; (over a special 22½ mi. course for 180 miles) Lt. Col. Robert L. Petit, Ventura, Calif., 500.704 mph. (lower than last year's Thompson jet winning time of 515.853 mph., due presumably to the tighter course and shorter straightaways used this year.

Kendall Oil Trophy Race for P-51s; Steve C. Beville, Hammond, Ind., 384.602 mph. (a new closed-course racing reciprocating engine record at Cleveland until the first three Thompson flyers exceeded it the next day).

Sohio Oil Trophy Race for P-38s; Tony LeVier, La Canada, Calif., 360.866 mph.

Tinnerman Trophy Race for P-63s; Hubert K. Knight, Jr., Dallas, 352.168 mph.

Halle Women's Race in AT-6s; Ruth C. Johnson, Upland, Calif., 223.290 mph.

Goodyear Consolation Race; William F. Falck, Warwick, N. Y., Chester Special, 141.615 mph.

Allison Trophy Race (Cleveland to Indianapolis to Cleveland for Army P-80 jet planes); Capt. Richard Burnor, Adrian, Mich., 494.277 mph.

▶ **Howard Outstanding**—Outstanding exhibition flying at the air races was topped by Beverly Howard, international acrobatic champion, who flew both his Piper clipped wing Cub Special, and his Buecker Jungmeister bi-plane. Precision team aerobatics by the Marine blue angels in Grumman F8Fs, and by two Army P-80 pilots who made high-speed dives to pass each other in front of the grandstand with both planes travelling near the 600 mph. mark, were other highlights. The Navy air show included a noisy simulated bombing attack on the airport, perhaps the most exciting crowd spectacle of the entire program.

▶ **Crowd Heavy**—Top crowd of the show on Labor Day was estimated at 75,000 in the grandstands in addition to probably 100,000 who watched from surrounding areas and from their cars. Sunday's crowd was estimated at 70,000, while Saturday's show except for the Bendix race, was cancelled because of heavy rains at the airport. The Sunday show combined the racing events scheduled for Saturday and Sunday, and the management honored Saturday's rain checks.

Presentation of the Weatherhead Jet Speed Trophy in turn to the three American pilots who have successfully set new world speed records was made by Frederick Crawford, Air Races President, and A. J. Weatherhead, President of the company which is the trophy donor. Col. Albert Boyd, whose P80R flight of 623.8 mph. brought the world speed record back to this country, received it first and then passed it in turn to the Navy and Marine pilots, whose flights in the D-558 Douglas Skystreak, brought the record first up to 640.7 mph. and then to its present mark, 650.6 mph., Comdr. Turner Caldwell, and Maj. Marian Carl.

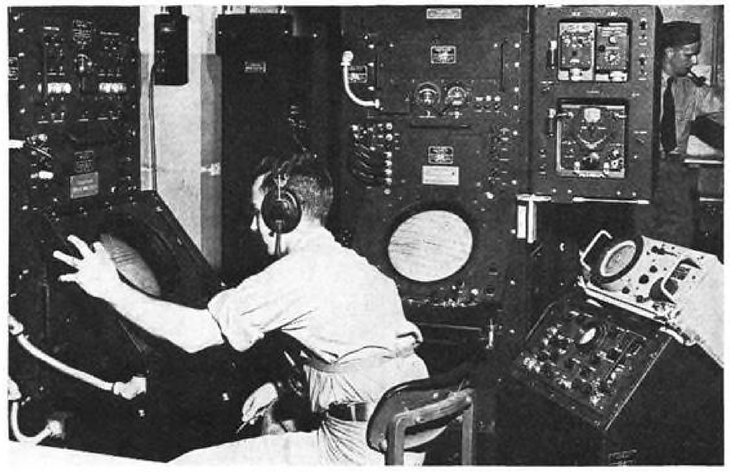


Photo shows operator at new Bendix GCA equipment recently installed at Quonset Naval Air Station.

New Bendix GCA Installed at Quonset

Navy now training traffic controllers on radar for new control tower scope installations.

A new search radar and GCA radar landing aid, made by the Bendix Aviation Corp., has been installed at the Quonset Point (R. I.) Naval Air station and soon will be operating.

Both Navy and Bendix officials look upon the new set as the possible prototype for commercial radar installations to come. All controls and scopes are located in an air conditioned room on the floor beneath the field's regular control tower.

▶ **Training Change**—According to Navy officers, hereafter all men trained as traffic controllers also will be sent to radar schools so that they can use the scopes when an airport closes in. This will eliminate most of the need for extra help to man the scopes, drastically cutting the $50,000 a year payroll for each unit which was sought in the last budget of the Civil Aeronautics Administration.

The Quonset installation consists of a radar search and height finder and a GCA or approach radar system. For the search radar, transmitters receivers and associated equipment are mounted in shelters at the top of two steel towers about 500 ft. from the operations building. Antennas are on the roofs of shelters.

▶ **Quick Shift**—The GCA unit looks much like the wartime mobile truck but contains only the transmitter and receiver equipment and necessary test rigs. Permanent concrete stands have been constructed at the sides of the runways and Bendix experts say that unit can be shifted from one position to another in about 25 minutes.

All of the outside units are linked to the control room by wires and coaxial cable. The GCA truck is 5000 ft. from the tower. Installation used about 110,000 ft. of cable. Total cost estimate: about $350,000.

Improvements in the precision landing system include an electronic follower which allows either the azimuth or elevation operator to focus the other antenna when he spots a plane, thus giving immediate information to both operators.

Another aid installed with the Quonset setup is the Bendix GDF-1 VHF ground direction finding system. This gives instant visual bearings on radio signals transmitted on any frequency between 100 and 156 megacycles.

NAA Signs With Union For 5c Wage Increase

After five months of negotiation, North American Aviation and UAW-CIO (Local 887) have agreed on a new contract carrying a wage increase of 5 cents an hour. Retroactive to June 23, the wage rise is in line with the aircraft industry's pattern for the Southern California area.

Other benefits granted include two additional paid holidays and increased sick-leave and vacation allowances. Contract's concessions, together with benefits and increases previously granted boosts company's payroll more than $2,000,000.

Under no-strike provision, company foregoes privilege of suing local or international unions and officers in event of wildcat work stoppages, if union takes action to keep members working. Also included is union no-strike pledge and company's assurance for no lockouts.

Contract is effective for two years, subject to re-opening for wage discussion after one year. Union is recognized as bargaining agent at company's Long Beach and Pacific Aviation plants.

Cosmic Wind, piloted by Tony LeVier, was one of five light racers built by LeVier and Associates.

Revamp Styles?

Lightplane Race Offers New Field For Design Tests

Goodyear trophy initiates competition for new planes with features applicable to commercial production; specifications listed.

By ROBERT McLARREN

Original design returned to the National Air Races this year with the initiation of the Goodyear Trophy Race. The new event also introduced rigid safety requirements in both the design of the airplane and the demonstrated capabilities of the pilots prior to their acceptance as starters. Skilled engineering and amateur construction fought for the trophy but experienced "know-how" brought home the prize, leaving engineers and hot pilots alike confused in their search for a race winning formula.

The Goodyear Trophy was won by a 10-year old airplane built by "Steve" Wittman of Oshkosh, Wis. who has flown in every National Air Race since the first running in 1928. The Wittman Special was redesigned to meet the Goodyear specifications prepared by members of the Professional Race Pilots Association. Modifications consisted of a new, smaller power plant, new wing and redesigned landing gear, which retained the spring steel full cantilever design patented by Wittman in 1936. With a wing area of 67 sq. ft. and a gross weight of less than 800 lb., Wittman's speedster came well within the wing loading limit of 12 lb. per sq. ft. and was among the lightest ships in the race.

▶ **Steel Tube Fuselage**—An NACA 0009 symmetrical airfoil was used for its low drag and stable center-of-pressure position, relieving the pilot of longitudinal stability problems. Fuselage is welded steel tubing with fabric covering over wood fairing strips. Wing spar and ribs are laminated spruce with fabric covering.

▶ **Chester Special**—Most original entrant in the event was Art Chester's butterfly tail monoplane exhibiting aerodynamic refinements throughout its design. Chester, who vies with Wittman for National Air Races longevity, approached the event as both experienced engineer and veteran racing pilot. Piloting the Chester Special to second prize money of $4850 was Paul Penrose, Western Air Lines pilot who won the Chalmers Trophy at Miami last February. The mid-wing design has a welded steel tubing, fabric covered fuselage and plywood covered full cantilever wings.

▶ **Cosmic Winds**—Third and fourth place money went to LeVier & Associates, a group of four backer-pilots, five engineers and 50 mechanics in Southern California. This imposing array of aircraft talent produced parts for five "Cosmic Wind" light racing planes but only two were assembled for the races. About 10,000 manhours went into the project plus $20,000 and unannounced "participation" agreements. Including LeVier's victory in the Sohio race the group took $10,200 from the races—$5,700 from the Goodyear event.

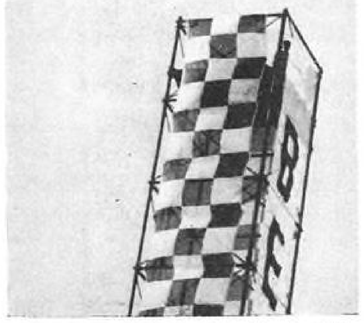
▶ **Race Requirements**—The Goodyear Trophy race offers the first set of specific racing airplane airworthiness requirements and pilot qualifications guaranteering maximum safety in an air racing event. Created by the Professional Race Pilots Association, the specifications were formulated entirely by the racing pilots themselves.

Before being entered in the event, each plane must perform a satisfactory flight test before a PRPA technical committee consisting of:

- **Full Throttle Takeoff** without veering more than 30 ft. from a straight line on the runway.
- **Pull Up From Steady**, level flight at a minimum of 6G acceleration at 5,000 ft.
- **Demonstrate a Dive** at 1.3 times the maximum level flight speed of the airplane.
- **Perform Three Tight** turns of 120 degrees without an appreciable loss of altitude.
- **Fly Three Laps** over the pylon course making turns at full speed.

Pilot requirements are designed to insure that the pilot have considerable flying time and a suitable amount of time in the racing plane he enters to indicate familiarity with stability and control features. These included:

- **At Least 500 Solo** hours or proof of 10 hours time in the racing plane for every 100 hours less than 500 logged.
- **At Least 2 Hours** time in the racing plane within the last 90 days including five takeoffs and landings prior to the qualification trial.
- **Fly The Racer** at least eight consecutive laps over the course, two laps at a speed greater than qualifying speed, or proof of previous participation on a closed course.

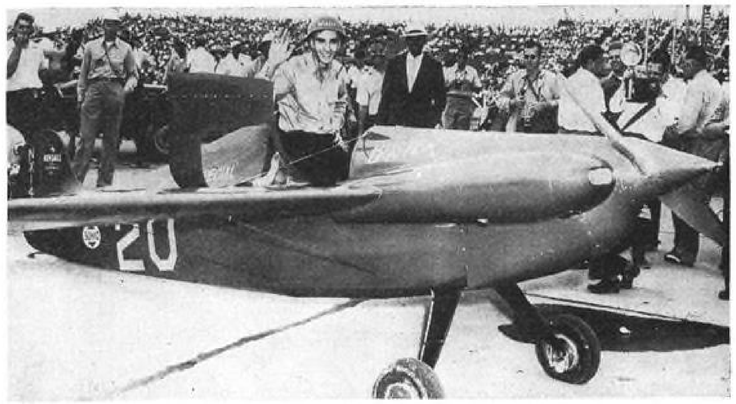


LeVier's Lightning rounds pylon in Sohio event. LeVier's "Little Toni" took fourth place in the Goodyear Trophy race. Sister ship piloted by Herman Salmon placed third in same race.

Tony Jannazo, killed when his Corsair crashed during Thompson Trophy race.

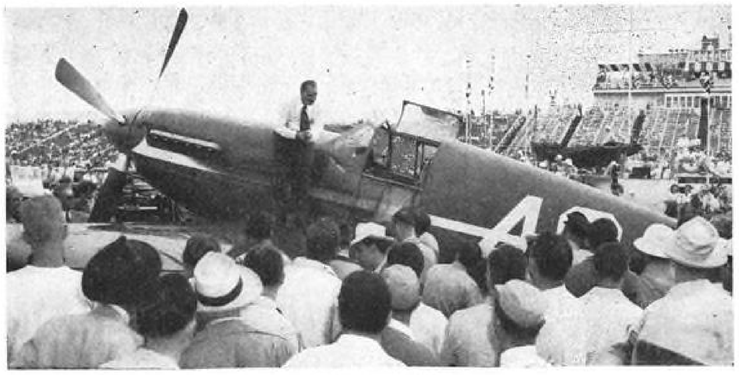
Picture Report

National Air Races at Cleveland



GOODYEAR TROPHY WINNER

William Brennand and the Wittman racer in which he won the Goodyear Trophy. (Press Ass'n. photos unless otherwise specified)



MANTZ ARRIVAL

Paul Mantz leaving his P-51 after winning the Bendix Trophy race.

BENDIX ENTRIES

Some of the entries in the Bendix race shown at Van Nuys, Cal., just before takeoff. (I N photo)

Marchev to Head Aircraft Screw Firm

Curtis Wright elects two vice-presidents, other personnel changes reported.

Alfred Marchev, formerly president and chairman of the board of Republic Aviation Corp. has been elected president and general manager of Aircraft Screw Products Co. of Long Island City, N. Y.

Marchev relinquished the presidency of Republic and moved up to board chairman last December. He resigned in the Spring in ill-health and returned to the industry only recently as a member of the board of Aircraft Screw Products.

In other personnel actions:

• **Curtiss-Wright Corp.** named Joseph F. McCarthy and Lawrence B. Richardson vice-president. McCarthy has been with C-W since January as treasurer and controller. Richardson, formerly deputy chief of the Naval Bureau of Aeronautics, joined the company a year ago as assistant to president Guy W. Vaughan.

• **Menasco Manufacturing Co.** elected Henry P. Nelson executive vice-president and general manager and Gerald Preshaw secretary-treasurer. Donovan H. Tyson resigned as executive vice-president, treasurer and general manager. Nelson formerly was the company's eastern representative. Preshaw formerly was vice-president and treasurer of the Aireon Manufacturing Corp., and during the war was comptroller of the Douglas plant in Chicago.

• **Lockheed Aircraft Corp.** announced the resignation of Roger Lewis, assistant general manager. He had been with the company for 13 years. He has not disclosed his plans.

• **Sperry Gyroscope Co.** appointed Dr. W. L. Barrow chief engineer. He has been with Sperry since 1943 as director of armament engineering.

• **Curtiss-Wright Airplane** division appointed T. B. Focke factory manager at Columbus, succeeding R. A. Fuhrer who resigned. Focke served during the war as a captain in the Navy and at one time was head of the production planning division of the Bureau of Aeronautics.

• **Gladden Products Corp.** announced the resignation of William P. Stratton, Jr. as sales and advertising manager. His successor has not yet been appointed. Stratton has accepted the post of sales and advertising manager of the wheel division of Roll-Rite Corp., Oakland, Calif.

• **Douglas Aircraft Co.** named W. S. Fryer to succeed P. L. Porter as part sales manager. Fryer, formerly Porter's assistant, has been with Douglas for 12 years.

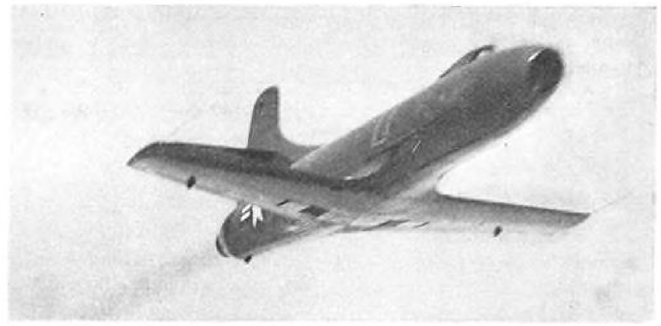
• **Raybestos-Manhattan, Inc.** appointed Harry C. Dishman equipment sales manager with headquarters in Detroit; George T. Young, manager of the Detroit office; E. E. Juergens, manager of the Cleveland office; and John E. Cole, manager of the Chicago office. They all have been with the company for a number of years.

• **General Electric Co.** named H. C. Carroll engineer in charge of the marine and aeronautics engineering division to succeed Ray Stearns who has retired after 45 years with the company. Carroll has been assistant engineer of the division.

• **Consolidated Engineering Corp.,** Pasadena, Calif. elected Dr. Fred C. Lindvall to the board of directors. He is professor of electrical and mechanical engineering at California Institute of Technology.

Strike Cancelled

Following recent expiration of a CIO-UAW contract with Ryan Aeronautical Co., a scheduled machinists' strike was cancelled upon report that the National Labor Relations Board would conduct a hearing to determine whether this union or International Assn. of Machinists should bargain for workers. CIO-UAW's February demand for 23½ cents per hour had been reduced to 15 cents.



DOUGLAS SKYSTREAK ON RECORD RUN

Fastest action shot of a man in motion ever taken shows Marine Major Marion Carl streaking over Muroc speed run at 650 mph. Short-span, low aspect ratio wings accent high-speed design of the D-558 in this view. Two airspeed heads are used, one for pilot's airspeed indicator, other for recording equipment on research shelf behind pilot. (Navy photo)

NEW D-558 CANOPY

Closeup of D-558 with Comdr. Turner F. Caldwell, Jr., shows new heat-resistant canopy installed for speed record runs replacing former plastic design which indicated failure from 170 deg. temperatures created by record-breaking speeds. Also shown are air bleed ports in duct center plate, the lower providing high ram pressure air for cockpit refrigeration unit, the center holes providing pressure pickup points for duct research. Fuselage dive brakes may be seen on aft fuselage in retracted position. (Navy photo)

AVIATION CALENDAR

Sept. 10—ICAO legal committee, Brussels.
Sept. 13-14—Wisconsin Civil Air Corps convention, Milwaukee.
Sept. 8-12—Second annual conference and exhibit, Instrument Society of America, Hotel Stevens, Chicago.
Sept. 15-17—Air Force Association, first annual convention, Columbus, Ohio.
Sept. 16—International Air Transport Association, technical committee, Nice.
Sept. 16-18—Second Regional CAA conference, Atlanta.
Sept. 17 — ICAO meteorological division Montreal.
Sept. 23—ICAO aerodromes, air routes and ground aids division, Montreal.
Sept. 23—ICAO joint air/ops committee meeting, Paris.
Oct. 2-4—Autumn aeronautics meeting, Society of Automotive Engineers, Biltmore Hotel, Los Angeles.
Oct. 3-4—Arizona State Aviation Conference, Douglas, Ariz.
Oct. 10-13—Southern Calofarnia National Air Races, Long Beach, Cal.

Willis Tear Gas to India

Contract to fly 12,500 lb. of tear gas from Pittsburgh to Karachi, India for the India government has been awarded to Willis Air Service, Teterboro, N. J.

Contract carriers bid on the shipment, originally 17,000 lb., through an American export organization, but arrangements were shifted to a British exporter who obtained a charter rate from BOAC.

Subsequently the load was reduced and the job assigned to Willis, which has a blanket contract with a Rome shipper to provide return cargo when returning ships may be in need of payload.

Jack & Heintz Sales Boost Yields Profits

A steady increase in gross sales, with a resultant profit in the first six months of this year, has been shown by Jack & Heintz Precision Industries, Inc. in a strong comeback from postwar difficulties.

Second quarter sales of $6,727,719 nearly doubled the total for the first three months, with fractional horsepower motors accounting for approximately 50 percent of the billings. Aircraft products produced about 15 percent of the income. No comparative data are available for the like period of 1946, as the former Jack & Heintz, Inc. was reorganized into the new company by a merger in March, 1946. For the third quarter of 1946, sales were $1,566,315, and for the fourth quarter, $2,850,289.

With six months sales this year at $10,444,300, J&H realized an operating profit of $507,409. Non-recurring income of $524,808 pushed the net to $1,032,218. Due to heavy losses last year, there are no taxes chargeable against this income. An unaudited loss of about $318,000 was sustained in the first quarter.

► **Profit Potential**—Company feels that the upward sales curve may be checked in the third quarter of this year due to a three-week plant-wide shut-down for vacations. Despite this, the company does not feel it has achieved its full profit-making potentials. The six-month report points out that "during this period earnings were adversely affected by continued costs of reconversion for peacetime production, development of new products, and preparation for production of such products."

As of Aug. 1, J&H had a backlog of unfilled orders amounting to approximately $43,000,000. With the boosting of sales came re-hiring to increase the number of employees to 4,100.

SKY MARKER

Sample of the airmarkers that will be painted along Skyway No. 1 between Los Angeles and Washington D. C., for the benefit of private pilots flying the route.

INDUSTRY OBSERVER

► **Navy and Glenn L. Martin Co. plan an extensive test program with two P-4M-1's, long range patrol bomber featuring combination of jet and piston engine power, already completed. Navy already has an order for seven more P-4M's. Funds for about 20 additional planes of this type were restored in final version of Navy's 1948 budget.**

► Lockheed has completed 30 P2V's, long range twin engine patrol bomber of the Truculent Turtle type, of its original order for 98. Navy has one P2V squadron in service on the Pacific coast and plans early activation of another for the Atlantic coast.

► **AAF plans to equip its 14th fighter group at Dow field, Maine with Republic P-84 Thunderjet fighters before the end of the year. AAF credits the P-84 with a 7,500 ft per min. rate of climb.**

► Pratt & Whitney have already boosted their Wasp major engine (rated at 3,500 hp.) to 4,000 hp. under test conditions and expect to get 5,000 hp. within 18 months through achieving high brake mean effective pressure.

► **Sperry Gyroscope Corp. is experimenting with remote control devices for Boeing B-29's. Seven C-54's of the AAF All Weather Airline are being equipped with Sperry A-12 autopilots with automatic approach control units making possible automatic landings on the Sperry microwave landing systems now installed for service testing at Andrews field Md. and Wilmington, Ohio.**

► Glenn L. Martin Co. has a Navy project for a giant flying boat larger than the 80 ton Mars. The new boat will incorporate the new NACA designed planing tail hull which promises sizeable drag reductions over conventional hulls.

► **RCA is putting finishing touches on the first field equipment for Teleran, its radar-television, all-weather flying and traffic control system. First installation will be used for joint AAF, CAA and Air Transport Association flight tests at Andrews field, Md. this fall.**

► Howard Hughes' high altitude photo plane, the XF-11, is due at Muroc soon for final flight testing. Hughes' test pilot, Jack Williams, has put the XF-11 up to 30,000 ft. without incident. He is scheduled to do dive tests up to compressibility and then placard the plane at 10 percent lower for guidance of AAF pilots when they fly formal acceptance tests that determine whether AAF will allow Hughes Aircraft Co. a profit on the venture.

► **Navy's latest jet fighter, the North American FJ-1 was badly damaged en route from Muroc to the Naval Air Test Center at Patuxent, Md. The plane, piloted by Al Conover, averaged 496 mph. for the Muroc-Oklahoma City leg of 1150 miles at cruise power. On take-off from Oklahoma City the tail pipe caught fire and badly damaged the plane before Conover could get it down.**

► North American XP-86 swept-wing fighter was scheduled to undergo preliminary test flights at Muroc Army Air Base, Calif. last week. Straightline takeoffs and landings are not considered official test flights and they are used only for general longitudinal stability tests of the XP-86 "fore and aft" balance. Plane closely resembles Navy XFJ-1 with addition of swept-wing panels. North American test pilot Al Conover believes the plane capable of considerably more than its design 650 m.p.h. top speed.

► **NACA's XS-1 highspeed flight research program got under way last week with Howard Lilly, Aircraft Propulsion Research Laboratory, and Herbert Hoover, Langley Memorial Aeronautical Laboratory, named as test pilots for the program. Both are stationed at Muroc Army Air Base undergoing preliminary training for the flights. This training consists of engine ground runup followed by preliminary glide tests without power. First power flights in the long, tedious research flight test program are scheduled for mid-Sept. In the meantime Capt. Charles Yaeger, AAF test pilot on the Army's XS-1, has completed several air-launched gliding flights preparatory to the start of the Army's performance test program.**

► Douglas, Navy and NACA engineers are studying the results of the D-558 record-breaking flights, which indicated the onset of compressibility in the nose inlet diffuser at a mach number of .8 resulting in a sudden drop in turbine speed.

► **Northrop has again temporarily suspended its Flying Wing (B-35) bomber test program due to propellor gear box trouble. The giant all-wing aircraft was grounded during most of last winter for the same cause. As a result only 20 hours of flight time have been possible during the past year during which 24 propellor failures were experienced. Since propellors are Government-furnished equipment Northrop decided to suspend its test program until suitable propellors are furnished.**

► The Douglas AD-1 Skyraider, new Navy attack plane, recently passed its carrier qualification tests aboard the escort carrier Sicily.

FINANCIAL

Anti-climax Seen in CAB Approval of Denver-Los Angeles Route Sale

Significance to Western outpoints benefits to United, already serving Los Angeles directly through route consolidations.

Civil Aeronautics Board approval of the sale of the Denver-Los Angeles route by Western Air Lines to United Air Lines (AVIATION WEEK, Sept. 1) was an anti-climax in many respects. A few months ago, United attained its long-sought objectives of a direct entry into Los Angeles from the east through the simple expedient of route consolidations granted by the CAB.

In a four-to-one decision, the Board sanctioned United's purchase of Western's Denver-Los Angeles franchise and other facilities for $3,750,000, the original price agreed upon by the two carriers. This transfer will become effective by September 17. Chairman Landis dissented, maintaining that the sales price should have been reduced by $1.5 million, representing the difference between the purchase price and Western's original cost.

► **Sale Conditions**—The Board tacked on two conditions to the sale, both of relative minor significance. The amount of $1.5 million, representing the price paid for intangible values, must be charged to United's surplus account. Further, no local service can be conducted by United between Los Angeles and Las Vegas, Nevada.

The CAB found that Western paid $2,022,400 for the tangible properties to be transferred. After depreciation, the properties were worth $1,691,188, leaving more than $2 million for intangibles.

► **Landis Dissent**—Mr. Landis, in his dissent, took a serious view of the Board's decision, stating that it would have "inflationary" consequences and "equally serious effects on future mergers, consolidations and route transfers." Further, a series of mergers and route transfers will be provoked that will be "irrational and unfortunate because they will be dominated by the principle of selling to the highest bidder." The chairman continued that if the public is to pay for the mistakes of past management, "it would be far cheaper in the long run for the public to make an outright gift to Western of $1.5 million rather than introduce a doctrine that will promote inflation, make against an integrated route pattern, and at the same time cost the public $1.5 million and more."

Thus far, there is not a single instance where the Board or its predecessor, has ever insisted upon maintaining the purchase price of any route franchise in line with tangible values.

► **Marquette Deal Recalled**—A merger of unusual interest surrounded the proposed acquisition of Marquette Airlines by TWA in 1939 for $473,333. Also, a commission of $35,000 was to be paid to another airline official for arranging the transfer. The Board, in July, 1940, denied this application chiefly on the ground that the price was excessive. Taking the hint, TWA, a few months later, filed another application, this time offering to pay $313,333 or a reduction of about one-third of the original price. This time the Board approved with member Edward P. Warner dissenting.

The Board's reasoning is the first instance carried strong implications. At that time, the CAB declared: ". . . it would be clearly adverse to the public interest to allow a certificate of convenience and necessity to be treated as if it were a speculative security, to be sold by the holder to the highest bidder . . ." While in its later decision, the Board approved, Dr. Warner disagreed, and declared: "If, as the Board then held, it is not consistent with the public interest to allow the transfer of air carrier properties under conditions involving the payment of substantial compensation for the bare certificate . . . the terms now proposed are as clearly contrary to the public interest as were those of five months ago—for it is impossible to discover that Marquette has had anything in its possession other than the certificate, which has a value approaching either the compensation proposed in July or that now proposed."

► **Other Acquisitions**—United has figured prominently in other route and property acquisitions. During 1943, the Board approved United's purchase of a 75 percent interest in LAMSA, a Mexican airline. The price was $145,750. Of this amount, $32,000 represented the book value and the balance, $113,750 was applicable to franchises and goodwill. This time, with no dissents, the Board asserted that the purchase price was "not disproportionate to the values actually attached to the properties and business of LAMSA, including the operating rights."

In January, 1937, United sought to serve Denver on its transcontinental route instead of being forced to go through Cheyenne. At that time, the air mail routes were in the province of the Post Office Department but their value was the same. Inland Air Lines, then Wyoming Air Express, sold its Denver-Cheyenne route to United for $209,000. A few days later, the Post Office, in an independent action, placed Denver on United's system.

► **Western Position Strengthened**—There is no question that Western's financial position has been strengthened considerably by the recent Board Action. The carrier previously received a $1 million payment which would have been considered a loan with interest at 3 percent, if the sale had been turned down by the CAB. The fact remains that Western now receives a tangible payment, at an increment, for a route whose value has been largely nullified by the Board's previous route consolidation action.

This added cash will help Western clean up its financial picture. As of March 31, 1947, the company had a negative working capital balance of about $6.5 million. Notes payable alone aggregated $6,597,468. The $3,750,000 will make a sharp reduction in these liabilities. The Reconstruction Finance Corp. has previously indicated that, subject to CAB approval, it was prepared to loan Western $4,500,000 to fund the carrier's liabilities.

► **Inland Sales Attempt Expected**—Moreover, it is only logical to assume that Western will now attempt to sell its Inland Division to attain its avowed purpose of confining itself west of the Rockies and conducting a truly "regional" operation. It is interesting to note that in 1943, Western purchased a majority stock interest, with CAB approval, of Inland Airlines at a price of around $2.65 per share. With a 164,218 share capitalization for Inland, a total purchase price of $435,178 was indicated. Inland's book value was then stated at about half of this amount. Currently, the market price on the few remaining shares of Inland held by the public, is around $4 per share.

It is conceivable that Northwest, Mid-Continent and Continental would be interested in acquiring all or parts of the Inland division. It is moreover possible that United may find some interest in acquiring the Twin-Cities-Denver leg of this system. This would strengthen its service to this area and could tie-in effectively with its newly-acquired Denver-Los Angeles run. In any jockeying for the Inland Division, the only certain feature is that Western is willing to sell, the buyers have yet to tep forward, publicly at least. —**Selig Altschul**

Production Plans Set For Beaver With Foreign Prospects Good

De Havilland's Canadian bush freighter completes first flight; high performance with load attracts interest abroad.

Having completed a successful test flight, the Canadian-designed and built bush freighter, de Havilland Beaver, will go into production shortly at the company's Toronto plant, with a rate of one a week expected to be attained within a year.

While aimed principally at the home market of mining, oil and fur companies and charter operators, in Canada's sparsely-developed areas, the Beaver is specially fashioned for load carrying and already is showing promise of becoming a factor in the export trade.

► **Foreign Interest**—De Havilland officials state that inquiries have been received from Scandinavian countries, from South Africa, Australia and South America. Distinctive features of the Beaver apparently make it appealing for use in high altitudes.

Meanwhile, the company is assured of the sale of 25 of the planes to the Ontario Provincial Air Force, a government forestry and forest-fighting service, which has specified deliveries over a three-year period with 12 to be accepted by the end of 1948. The company reports tentative sales of 25 additional planes.

The Beaver, the second postwar Canadian-designed plane to come from the de Havilland plant (the first was the all-metal Chipmunk trainer), is an all-metal single-engine high-wing monoplane that can be equipped with wheels, floats or skis. It can be used as a light transport carrying five passengers plus pilot, or as a freighter with all seats except the pilot's being removable.

► **Quick Take-off**—It was constructed with the emphasis on high rate of climb (1,280 fpm. at sea level at 4,400 lb. gross weight) and quick take-off (515 ft. at sea level, zero wind and 40 degree flaps) to accommodate operations from small lakes and primitive landing strips.

Span of the Beaver is 48 ft., and length (landplane) 30 ft. Length of seaplane version is 32 ft. Outside fuselage width is 52 in. Fuel capacity is 80 gal. Edo model 4580 all-metal floats are standard on the seaplane. Provision is made on one of the floats for carrying a 16 ft. canoe.

In passenger version, the Beaver has space for baggage stowage on each side of the single rear seat. A large separate compartment to the rear of the cabin is for emergency bush kit, emergency rations, etc. Passenger seats are easily removable and the cabin has a reinforced floor. Floor under the removable seat next to the pilot is on the same level as the balance of the cabin so that long cargo items will lie flat.

There are four doors on the fuselage, two on each side for the pilot's and freight compartments. The main rear doors (for freight) are flush with the floor. Hatches are provided in the rear wall of the cabin and underside of the fuselage to enable long pieces of freight, such as a 10 ft. diamond drill, to be loaded and stowed. Gross capacity of the cabin is 144 cu. ft.

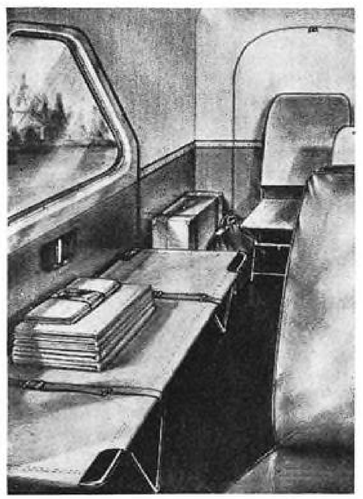
Gas tanks are installed under the cabin floor, thus eliminating any need to climb on the wing to refuel. Filler necks are positioned on the port side and can be serviced from the ground or while standing on floats, which also allows ground crew to see fuel contents gauge while refueling.

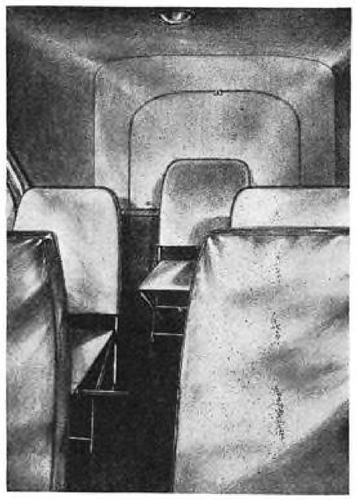
Specifications for the Beaver with Pratt & Whitney Wasp Junior 450 hp. engine allow a maximum speed for the landplane of 160 mph. and 147 mph. for the seaplane version. Cruising speed is 138 mph. for landplane, 127 mph. for seaplane at sea level, slightly higher at 5,000 feet. Absolute ceiling is 19,500 feet for landplane, 18,000 feet for seaplane.

The Beaver can carry 4 or 5 passengers and baggage or a freight load of just over a half ton. Visibility of pilot's cabin has been increased by fairing the wing root.

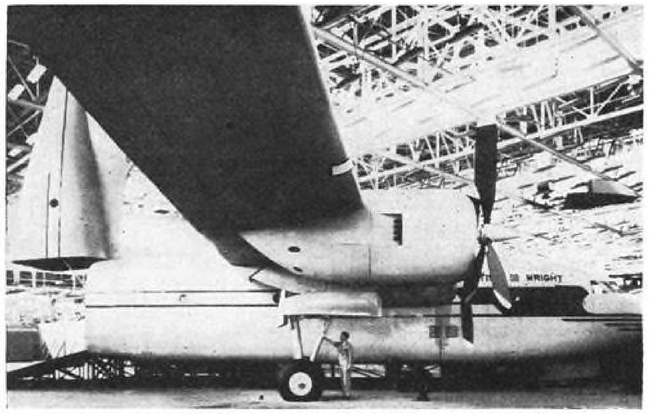
The Beaver is priced at $25,000 with both wheel and float landing gear.

De Havilland Beaver on first flight.





Versatility of de Havilland Beaver is indicated in this interior drawing. Wide cargo doors admit a standard stretcher, which is fastened to the floor, leaving ample room for seating three passengers. As an all-passenger plane, the Beaver carries five seats, positioned to permit maximum amount of comfort in the 144 cu. ft. cabin.



Curtiss-Wright CW-32 four-engine cargo mock-up now being shown prospective customer at the airplane plant in Columbus, Ohio.

C-W Shows Cargo Plane Mock-up

Company claims craft can handle any cargo now going by rail.

While completing and showing a mock-up of its proposed four-engine cargo plane, CW-32, at its Columbus airplane plant, Curtiss-Wright Corp. is delaying production plans until definite commitments can be obtained.

Prototype, originally scheduled to be flying sometime next year, will not be built immediately. A further change in the company's plans for the 100,000 lb. plane is the substitution of 2,100 hp. Pratt Whitney R-2800 engines for the 1,525 hp. R-1820 Wrights listed in the specifications when the plane was announced last November.

The change was made both to obtain more power for the plane in view of raising the gross from 80,000 lb., and to conform to suggestions of prospective buyers.

▶**Military Interested**—Two cargo carriers, Slick and Santa Fe, are understood to be studying the CW-32, and an AAF contract for a limited number is still a possibility. AAF officers went over the mock-up thoroughly.

If orders are forthcoming, C-W states it could build the first airplane in 12 months.

The CW-32 is one of the few postwar planes designed specifically and solely for cargo carrying. An innovation in loading arrangements is achieved by providing for the entire tail section of the airplane to swing up, exposing the full interior of the cargo hold. A heavy field gun or a 7½ ton truck can be driven aboard.

▶**Rail Competitor**—Cargo hold can accommodate a shipment weighing up to 32,000 lb. and measuring 48 ft. long by 9 ft. wide and 7 ft. high. Overall length of the cargo hold is 61 ft., and capacity is 4,800 cu. ft. The company claims the CW-32 can handle practically any type of cargo that now goes by rail.

In addition to the cargo entrance afforded by the hinged tail section, the plan has large cargo doors on either side of the fuselage, placed at truck-bed height. Because of the plane's high-wing design, a truck can back up to the side and discharge its cargo directly into the hold.

Curtiss-Wright claims the plane can carry a ton of cargo from New York to San Francisco at a direct flying cost of $112.

Kollsman Announces Tachometer-Recorder

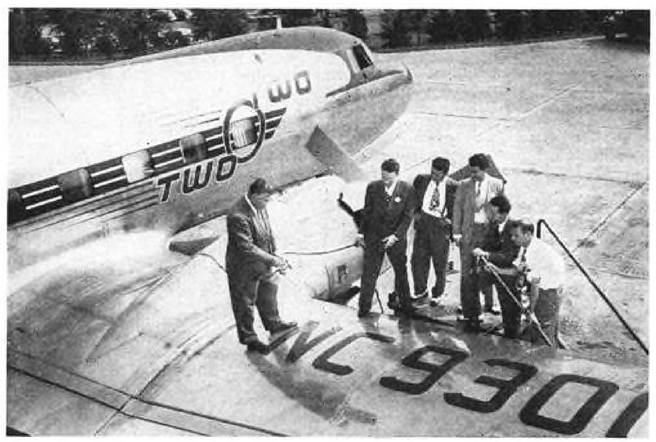
Tacholog, a combination tachometer and engine-hour recorder, measures revolutions per minute, eliminates the need for keeping a separate engine log for maintenance overhauls. Kollsman Instrument Division of Square D Co., 80-08 45 Ave., Elmhurst, N. Y., makes the lightweight device, which is designed specifically for use in small aircraft.

The instrument provides a cumulative indication of engine hours based on an average cruising speed of 2,000 r.p.m. Hours are counted at a slower rate when the engine is idling and more rapidly when the engine is operated at higher speeds. The instrument operates on either clockwise or counter-clockwise drives.

Kollsman claims that Tacholog has no adverse effect on the compass, even when the Tacholog and compass are installed side by side.

Former Bell Plant Sold

Four large buildings and 65 acres of the original Bell Aircraft Corp. property at Niagara Falls have been purchased from the War Assets Administration by the Carborundum Co. for $1,000,000. The tract and buildings are part of the plant formerly operated by Bell but released by the firm last May as not required in its future program.

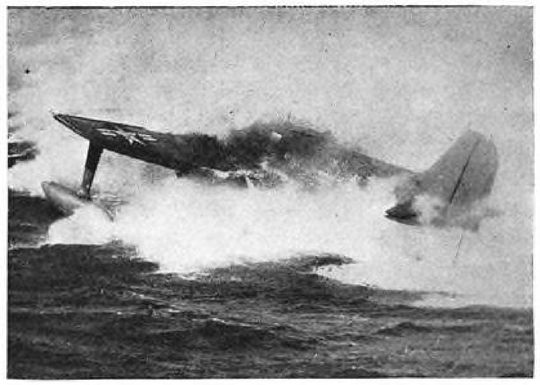


2-0-2 READY FOR AIRLINES

Culminating more than three years of discussion, design, manufacturing and sales efforts, Glenn L. Martin Co. officials fix the NC to the 2-0-2 airplane that recently completed the first accelerated service test after CAA granted an approved type certificate (Aviation Week, Aug. 18). O. E. (Pat) Tibbs, Martin's flight director who conducted the 2-0-2 tests, handles the spray gun as watching are, left to right: George Trimble, Jr., chief of aerodynamics; M. E. Gaydos, CAA flight analyst; Don. K. Covington and Stanley C. Cook, flight test engineers; and F. O. Furman, superintendent of airport.

Rough Water Operational Tests Conducted by Navy

Latest version of SC-2 has successfully completed last and toughest of acceptance tests—under the worst possible conditions.



SPRAY OBSCURES vision on take off in 35 mph. wind.

INITIAL IMPACT—Navy Scout lands in 5 ft. waves.

Latest version of Navy's SC-2 Curtiss Seahawk has successfully completed the last and toughest of acceptance tests—rough-water landings and take-offs under just about the worst possible conditions for seaplanes.

What happens when a 7,800-lb. seaplane becomes involved with five-foot waves and wind velocities up to 35 mph. is shown in the above series of pictures, taken during the recent tests that were run in Chesapeake Bay off the Naval Air Test Center at Patuxent, Md. At times the plane was completely covered with spray, at others, the entire wing tip would be under water. No serious damage was reported.

► **Navy Ratings**—The official Navy report on the tests gives the Curtiss plane, Wright engine and Edo floats satisfactory marks on this battering performance.

Navy's rough-water tests serve a two-fold purpose. They determine whether the airplane under study can be operated in rough water; and they also form the basis of reports which, within broad lines, can lay down operational rules for use of seaplanes off battleships and cruisers.

► **Weather Limits**—For instance, in the case of the SC-2, the results of the Patuxent trials indicate to skippers of ships off which the planes will be operated that a 35 mph. wind and five-foot waves may be the limit of bad weather conditions that this particular plane can operate in and be expected to survive.

Such conditions call for the utmost in both pilots and airplanes. Seaplanes generally are stalled on to the water in landing. If the pilot is faced with waves attaining a height of 5 ft., he might estimate he is still 4 ft. above a touch-down when actually, considering the height of the waves, he already is down. The resulting shock, when the wave hits, is considerable. It will usually bounce the plane into the air. Taxiing and take-offs present other problems, inasmuch as standard procedure most of the time is to undertake those maneuvers in the trough of the waves. Waves commonly run at right angles to the wind.

WINGTIP SUBMERGED but no damage reported.

CROSSWIND taxiing in troughs of heavy seas.

Engineering was shifted to XB-48 production site to insure close and quick coordination between these activities. Photo shows drafting and lofting sections of project group separated from shop and construction areas (background) only by open barrier.

New Expediting Techniques Proved in XB-48 Production

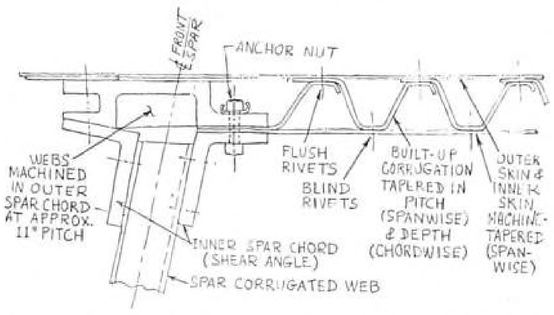
How tooling, procurement, and construction problems were overcome by Martin in fast fabrication of its large experimental jet bomber—sped by strategic placement of special engineering and production teams.

By IRVING STONE

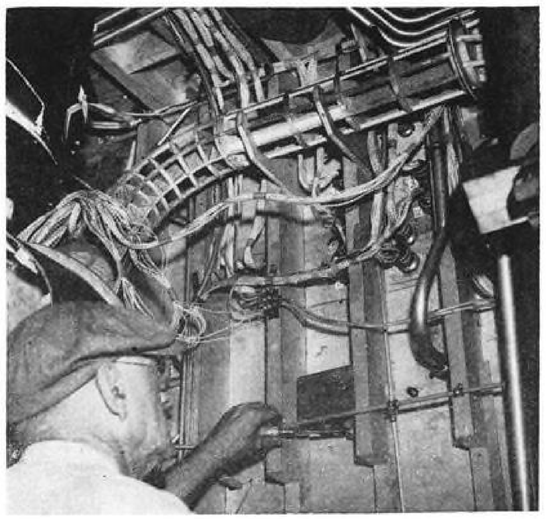
In building the high-speed six-jet XB-48 —a single-craft project—in less than 14 mo., The Glenn L. Martin Co. has set an engineering precedent for fast construction of large planes.

It is likely that Martin's procedure in this one-craft production scheme may serve as a basic pattern for rapid development of the many military single type experimental planes in our fast-changing aeronautical picture.

Following such a plan, advantages and



Field sketch of skin blanket cross-section, showing method of joining single corrugation sections. Added weight incurred by overlap and rivets were partially compensated by machining skins spanwise to gage of next panel outboard.



Interior of full scale mockup used for exact pre-layout of hydraulic tubing, fuel lines, wiring, receptacles, and numerous other items. When craft construction had progressed sufficiently, these installations were transferred directly to plane, saving much time. →

shortcomings of designs could be quickly determined, affording valuable information for constructing craft of similar specifications, without the need for slow and expensive tooling preparations involved in normal production schedules.

► **Engineering-Production Coordination**—For the single XB-48 project, selected engineering personnel (peak force was 137) from Martin's staff were moved from their usual segregated quarters directly to the production floor. Also established at this location was a separate accounting section. Site for construction of the aircraft was but a few hundred feet from the project area. A special raw stores department was set up, and material brought in via plane and truck from distant points, thus cutting many weeks from time required for normal ordering schedule.

Detail drawings were not released until it was ascertained that material for parts were available, and first parts were fabricated within one week after initial engineering drawings were released. Backlog of details released was not allowed to exceed 4,000 (34,000 constituted total number for the craft) to insure efficient coordination between engineering, shop, and assembly, with engineering maintaining a six-week lead on production.

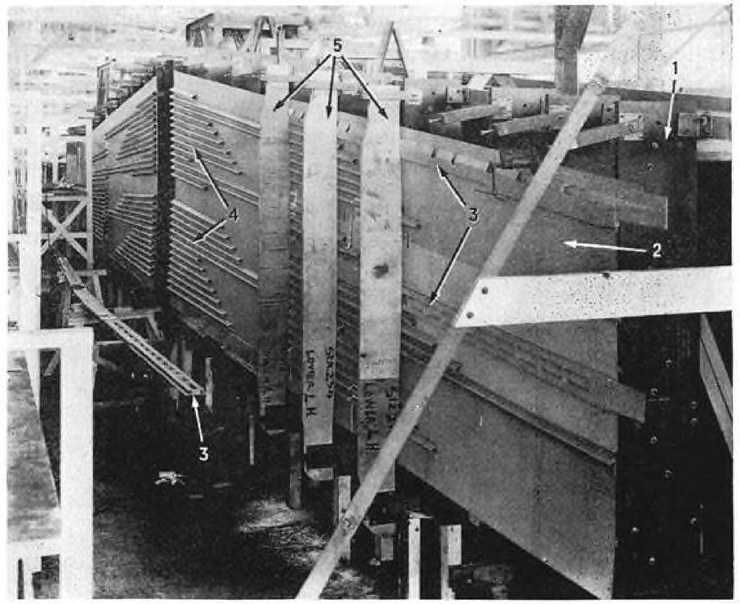
Normal routing through engineering, procurement, and production was frequently eliminated. With a simple sketch for a special part, the engineer would go to the adjacent shop and discuss fabrication details with the mechanic, work commencing almost at once if no additional tooling were required. If special tooling were needed, details were worked out immediately by engineer, mechanic, and tool designer, the tool drawing being routed directly to the shop for fabrication. When the part was finished it was taken to assembly for installation, or to storage until needed.

Weekly meetings between heads of engineering, production, tooling, manufacturing, and planning considered current and anticipated problems. And through this close coordination, special tooling and fixtures were eliminated wherever possible, acceptable substitute materials were selected, short-cut methods worked out, and additional personnel assigned to eliminate bottlenecks.

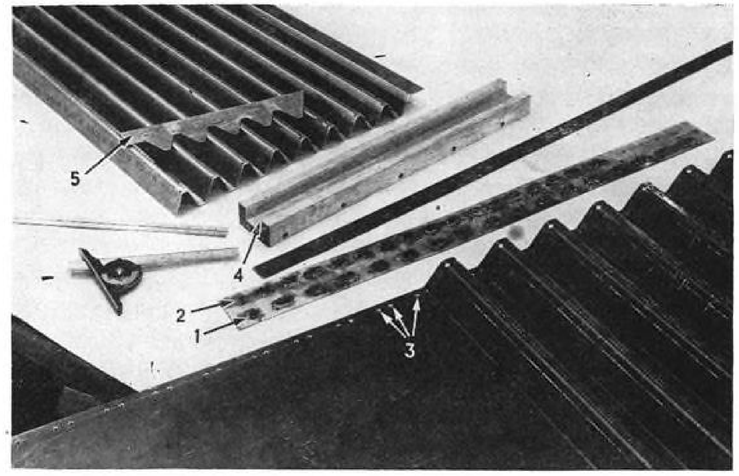
Here are some of the unorthodox—but effective—methods adopted at Martin to solve problems that generally confront the aircraft manufacturer in normal production schedules:

► **Mockup Utilization**—There is a serious production difficulty when the various group mechanics try to install equipment simultaneously in cramped quarters. To avoid this time-consuming condition, also to eliminate waiting for completion of the aircraft structure, a full scale wood mockup of cabin and forward wheel bay was constructed, since these were particularly equipment-congested areas.

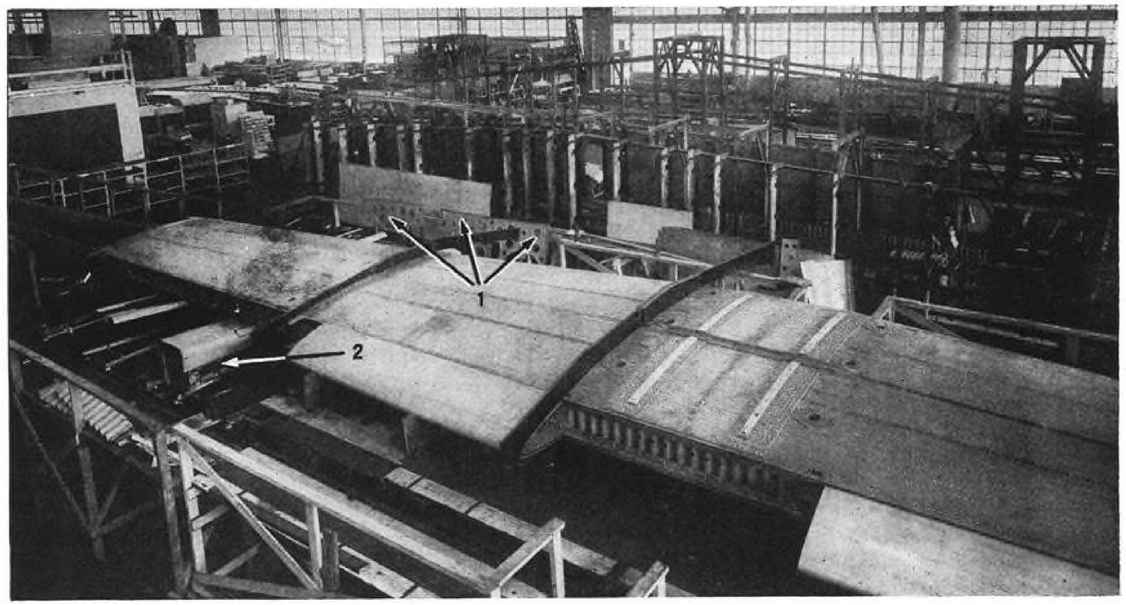
This gave group engineers an opportunity to have numerous sections of various systems prefabricated and fitted to the exact scale mockup under conditions simulating actual installation in the finished craft. Thus, when the craft structure had progressed sufficiently to receive equipment, the mockup installations were removed and transferrred directly to the airplane. Equipment so installed on the mockup included electric wiring, hydraulic and pneumatic tubing (complete with bends and unions), fuel lines, linkages for flight and engine con-



Center wing lower blanket. Butt joints of individual corrugation sections were staggered to use stringers formed on 12-ft. brake meet splice points 15 ft. apart. Details are: (1) Masonite skincontour headers, (2) outer skin, (3) spar chords, (4) corrugation sections, and (5) clamps for holding parts to contour headers.



Tapered corrugated sheet as formed by the hole-and-pin method on press brake, for second XB-48 project. Stretch-out development of centerline of each bend radius is laid out on template, layout being computed from engineering drawing of complete corrugated sheet. Holes to fit locating pin in brake die are drilled on each radius centerline, those on one edge of template for radius spacing of corrugated sheet inboard end (1) and on other edge (2) for outboard end. Template is placed on flat sheet and holes drilled distance between centers approximately 4 in. greater than finished length of sheet. Pins in brake V-die are spaced to accommodate drilling, and clearance holes for pins are drilled in punch. Sheet is then placed in brake with holes (3) located on pins in die for each bend. Two bends are made each time sheet is turned over. With sheet end held flat in block recess (4), another template (5) is used to check pitch, depth, and angle. Sheets are then sawed to finished length, removing holes used in forming.



Center wing box, with contour board for locating leading and trailing edges. Nacelle frames are at (1), bypass tunnel skin dummy at (2).

trols, fire control mechanisms, radio, instrumentation details, and seats. Wood models were used for cabin ventilation, anti-icing, and supercharging ducting, and then utilized to form actual ducting installations. Even miscellaneous items such as map case, first-aid kit, and thermos bottle were installed. Points of equipment-interference were caught early, and in addition to time saved by this pre-layout method, reworking was minimized on the production line.

► **Wing Construction**—Because of the thin wing required and high wing loading involved, double top and bottom skins were employed sandwiching trapezoidal corrugated stiffeners tapering in pitch (spanwise) and in depth (chordwise).

Ruled out was normal procedure for obtaining these corrugated sections—having dies built and sheets formed to required lengths and widths—since this would have delayed the project at least six months.

The 12-ft. brake in the plant couldn't be used to form the corrugations because it wasn't sufficiently long to fabricate the sheet span between splice stations. Shorter sheet lengths couldn't be spliced longitudinally because of added weight and stress factors.

Method finally adopted for constructing the corrugated sheet was to lap and rivet successive single corrugated sections tapered and decreased in gage from root to tip. Though this involved the weight penalty of metal overlap and rivets, the process was considered a substantial time-saver when the project was in the initial, one-project stage.

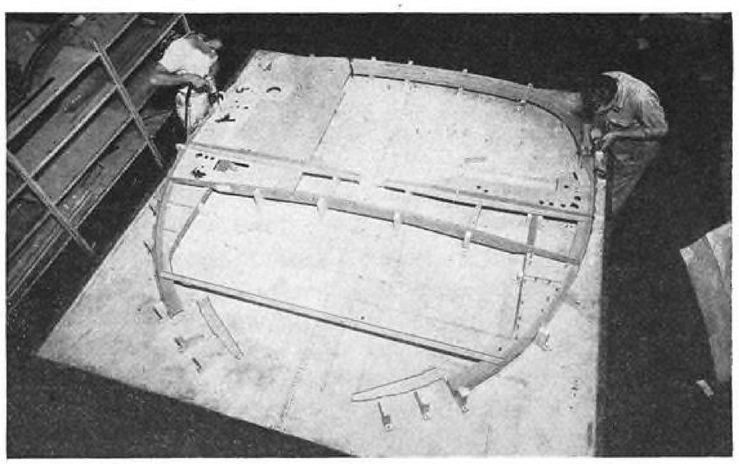
For the second XB-48 project, now under way, a brake of sufficient length was obtained to fabricate overall corrugated sheets. Bend points are determined by locating holes via stretch-out development on the flat sheet. Successive bends are made first on one side of the sheet, then on the other, over the entire sheet width.

Instead of using wing skins with panel continuous thickness decreased in successive spanwise panels, both inner and outer coverings were machined in the flat sheet from one thickness to that of the succeeding panel—as from .187 to .125; from .125 to .050. This afforded considerable weight-saving, and compensated in part for the additional weight involved in overlap and riveting of corrugated stiffeners.

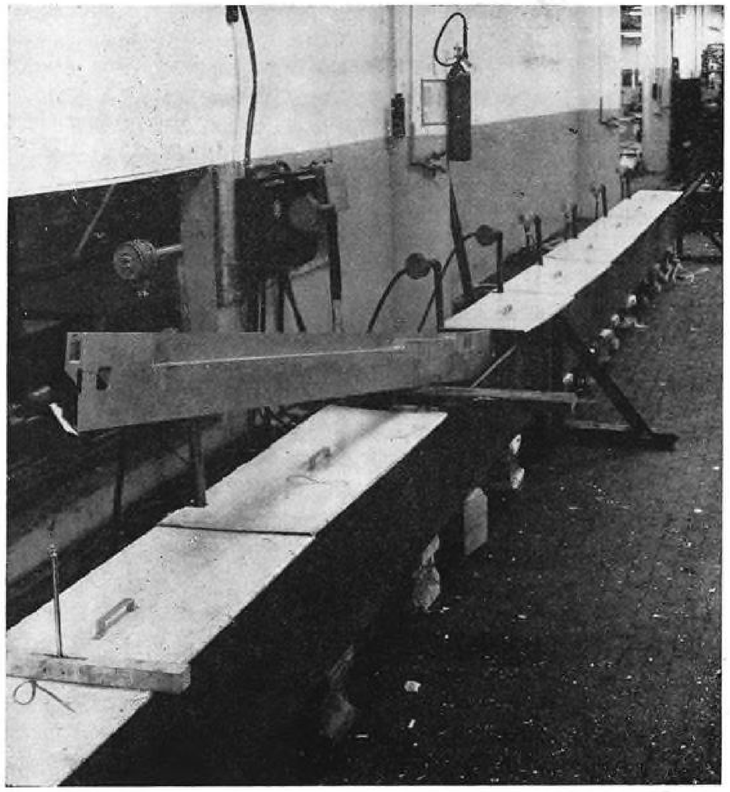
Close tolerances required on the airfoil contour dictated departure from usual method of building spar assemblies, so as to eliminate accumulation of tolerance errors. The erection process also simplified considerably usual tooling problem.

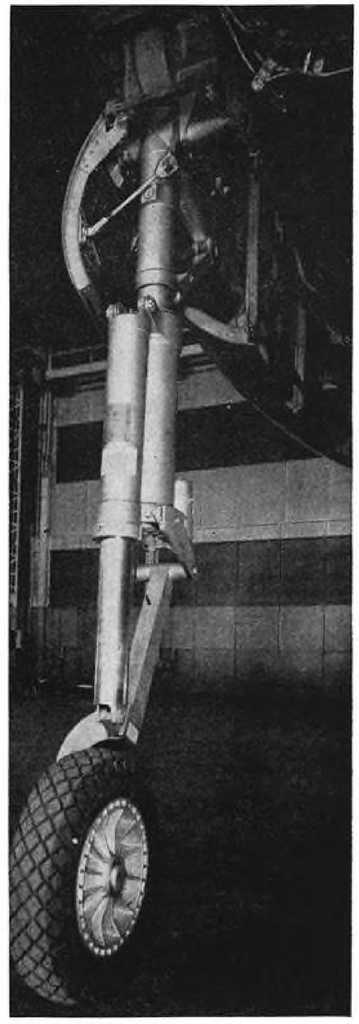
Vertical fixtures were erected with Masonite-sheet headers cut to outside skin contour. Wing components were then applied in this order—outer skin, splice plates, corrugation (stiffener) sections, spar chords, inner skin, and spar web shear angles.

During this assembly, splice plates, corrugation crests, and outer skin were drilled through, holes cleaned, and riveted. Spar chords were drilled and temporarily bolted.



Expensive tooling was avoided and time saved by using nested master lines lofts for assembly of frames, bulkheads, ribs, etc. Loft was fastened to flat table, and hardwood blocks for locating chords and other details were fastened along mold lines at station for particular assembly. As assembly was completed, other blocks were placed at another station for different assembly. Thus, single table could be used for many different assemblies merely by changing blocks. Engineering saved much time by eliminating detailed lofting, simply supplementing master lines loft with drawings (mostly free-hand) of assembly.





This tank, together with electrical controls, was built and in operation within 24 hr. after decision was made to facilitate bending of spar chords by first heating in oil bath.

Wing gears are light balancing units mounted outboard of nacelles to afford stability during taxiing, takeoff, and landing. Gear is full-castering, retracts into narrow bay. Small door is attached to strut, and larger door (seen open at rear) is closed except during gear extension or retraction. Main gear comprises two tandem-type double-wheel units retracting into fuselage.

Inner skin was applied, drilled through corrugation lower crests, and holes cleaned. Inner skin was then removed, spar chord permanently bolted with flush-head units, and skin next applied with blind rivets. Spar web shear angles were bolted through inner skin, spar chord, and outer skin.

This lower blanket assembly was then removed from the vertical fixture and placed in Masonite headers of horizontal fixture. Spar webs were then placed between shear angles and drilled and bolted in position. Wing ribs were attached between spars on lower blanket, without upper rib chords in place. Upper blanket was lowered on to spar webs and upper contour headers tied to lower headers to hold blanket firmly. Holes were then drilled through spar webs for bolted attachment of upper blanket shear angles. Upper chords of ribs were located and fastened to upper blanket and ribs. (Ribs had removable webs for access to inner portion of wing box.)

▶ **Short-Cuts**—To avoid delay of many months involved in outside fabrication of spar and fuselage bulkhead chords, Martin bought bar stock and machined these components. This was considered an advantageous method for single-craft production, and cost compared favorably with that for outside procurement, considering expense of special dies and minimum order quantities.

To facilitate framing of fuselage crown over center wing, a tool in the form of a dummy wing section was built for use in fuselage fixture. This avoided waiting until actual wing center section was ready for assembly to fuselage. Dummy wing section also served to locate wing-to-fuselage attaching fittings. In addition to time saved, extensive tooling costs were eliminated.

In another instance, a dummy was formed to obtain contour of bypass tunnel skin between power plants. After skin was formed, dummy was further utilized as part of the fixture to build up the nacelles and nacelle door assemblies.

Minor difficulties which might have caused delay were also anticipated. Thus, tolerances of flush-head screws used in the wing were pre-checked in a simple plate gage simulating the skin installation, to insure that these units would not protrude.

Difficult drilling of large-size close-tolerance holes through spar chords, shear angles, corrugation, and skin of the second XB-48 wing assembly has been simplified by adapting a drill press to the process. With the wing in horizontal position, the drill press is roller-mounted on tracks (I-beams) and supported by the wing contour headers, so that the drill is always normal to the surface.

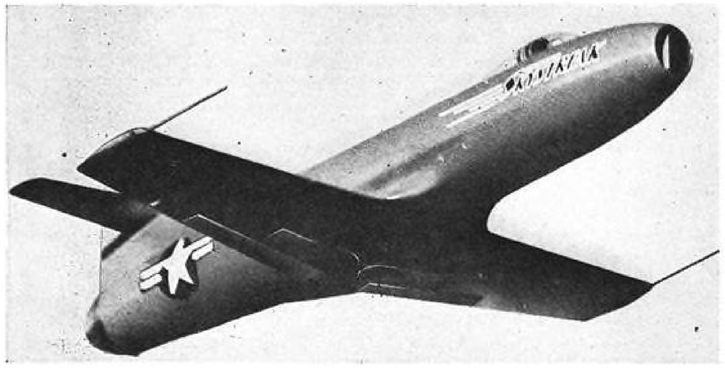
▶ **Fuel Cell Installation**—An interesting design feature is found in the structure arrangement permitting rapid removal of the eight fuel cells. Four of these units run from front to rear over the bomb bay; also, two cells are located one behind the other, in each wing, between fuselage and nacelle. Each end cell in fuselage rests on a removable floor to permit withdrawal through bomb bay.

The two center fuselage cells are drawn through removable bulkheads, so that each can be drawn into an end cell area, then down through bomb bay. Wing tanks are pulled inboard through removable ribs, down through opening in lower wing, and through bomb bay.

Escape Method Developed For Douglas D-558 Skystreak

Free fall of nose section to carry pilot safely out of transonic speed ranges prior to bail-out.

By R. C. DONOVAN, *Project Engineer, Douglas Aircraft Co.*



Douglas Skystreak in flight.

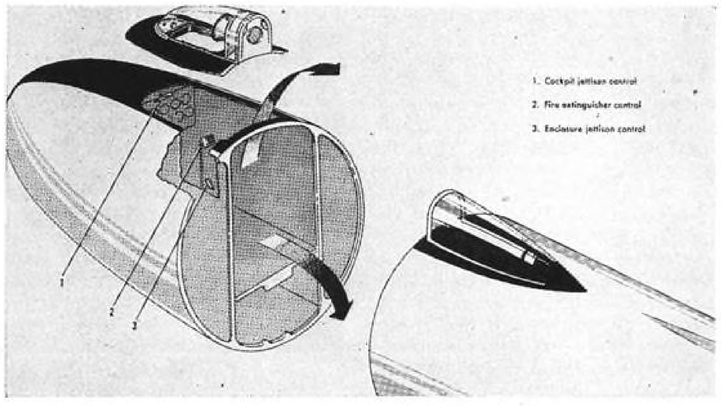
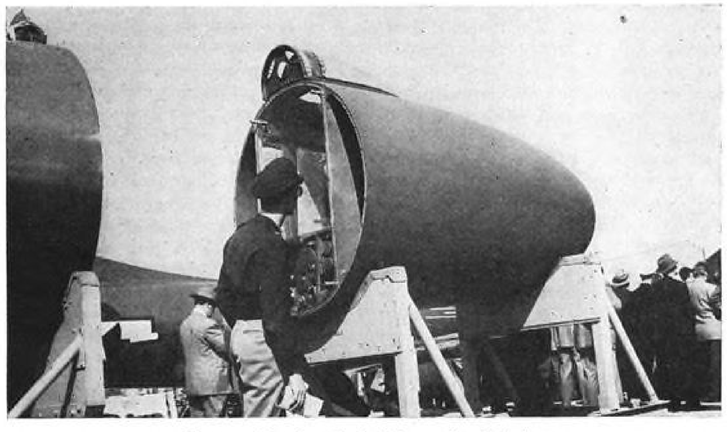


Diagram shows portions jettisoned and position of release controls.



Nose section detached; this portion falls free.

Safety provisions, as transonic velocities increase, for the pilot of the D-558 Skystreak in case of extreme emergency entered discussions early in 1945 between the Navy Bureau of Aeronautics, NACA and Douglas engineers.

While no difficulties were expected in pilot egress at subsonic speeds, as the normal cockpit bailing out method used in combat was to be employed, numerous ideas were discussed concerning transonic safety exit for the pilot. It was evident that direct bailing out into the transonic air stream would be unfeasible.

► **Escape Device**—The most logical solution seemed to be release by the pilot of a suitable enclosure which would fall free and slow down to a speed that would safely permit him to bail out.

Consideration was given to slowing the nose compartment during its free fall by parachute or dive brakes. Both were discarded due to structural difficulties in the case of dive brakes and because a suitable chute that would successfully open at high speeds was not available. Another method, to which only minor consideration was given, was that of having pilot and seat remain attached to rear portion of fuselage after nose was jettisoned; because of danger of possible nose collision and the fact that remainder of plane would probably react in an abrupt nose-up at the moment of c.g. change, this suggestion was discarded.

Investigation of present method indicated that nose compartment would probably slow down to about 300 mph. without any decelerating devices, and that it would be satisfactory to bail out at this speed, since some protection was afforded at moment of egress.

► **Design Details**—Design finally chosen evolved into a mechanical fastening of pilot's compartment to remainder of fuselage by means of four bombrack-type hooks. These were designed to operate mechanically by a pull handle located above center of instrument panel. A 60 lb. pull on handle completes, successively, a two-seconds decompression of the pressurized cockpit and release of bombrack hooks. The two-seconds decompression is deemed sufficient to preclude serious effects of an "explosive" decompression in releasing the nose section.

Once clear of the plane, and with falling speed sufficiently reduced, the pilot bails out by pulling a cable handle located against right sidewall of cockpit approximately at hip location. A 10 lb. pull on the handle simultaneously releases pilot's backrest and shoulder harness fastenings, allowing him to move or fall out of rear of cockpit.

Should speed of airplane be below that indicating a nose-breakaway escape, pilot can jettison bubble canopy section by a 20-30 lb. pull on cable handled also located on right side of cockpit near knee level.

An unusual problem was presented in the requirement of a quick disconnect system for controls leading from nose section into after airplane structure—both surface controls and engine controls.

It was deemed impractical to attempt to

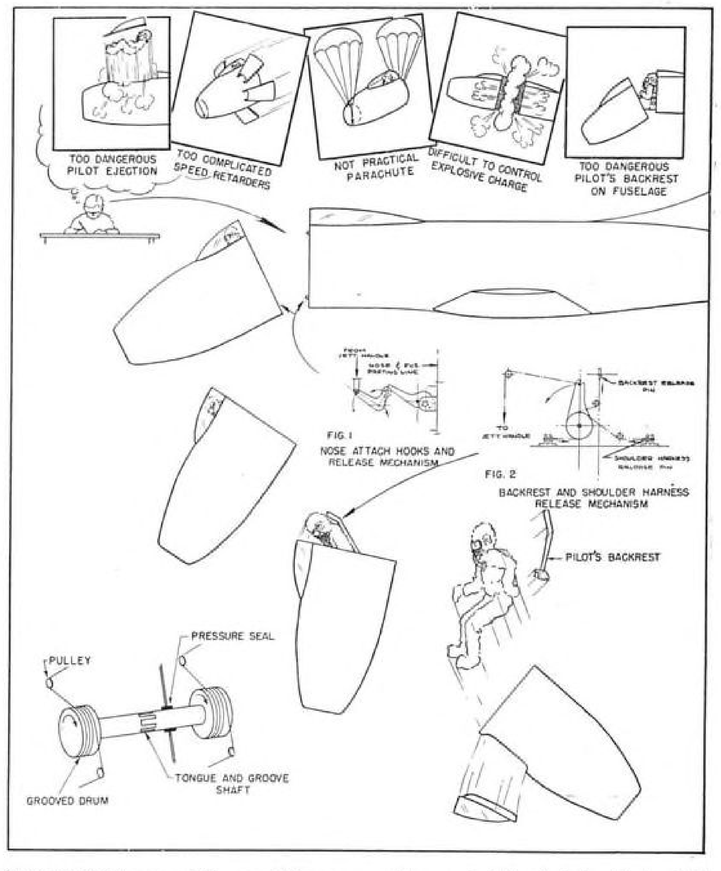
Photos show two methods of leaving nose section after emergency detachment. At left pilot rolls out. At right pilot backs from cockpit.

pass control motions through the pressurizing bulkhead at rear of cockpit (bulkhead being an integral part of airplane structure) by means of push-pull tubes mounted in pressure seals. Instead, control cables in nose section were lead to small drums mounted on steel shafts piercing pressure bulkhead and carrying similar cable drums at their after ends in non-pressurized airplane structure. Thus push-pull motion of cockpit cables was transformed to rotary motion at bulkhead and restored to cable motion on the other side. The transmitting rotary tube in each case was built in two sections with tongue-and-groove joints to transmit torque loads while being free to separate without tension load upon release of nose section. Electric controls passing through the bulkhead were equipped with pullout plugs.

▶ **Characteristics Studied**—NACA is now conducting tests on stability of a full-scale nose in the free fall condition and is also conducting small-scale tests to reproduce the jettisoning in high speed flight. Tests were also made in altitude chamber with pilot in cockpit of the Skystreak so he might obtain experience with anticipated occurrences should he be forced to use this method of escape at high altitude. These tests were concluded satisfactorily.

Due to cautious "inching-forward" nature of the flight research program into the transonic range, the jettisonable escape hatch is not expected to be used. It affords the pilot a super-safety provision as a last resort method of egress.

The careful approach to this problem is consistent with traditional policies of the Navy Department and the Douglas Company in affording every possible protection to pilots flying their airplanes.



Steps required to accomplish nose jettison escape. Top row depicts rejected methods which came under consideration. (Sketches by Bill Morgan)

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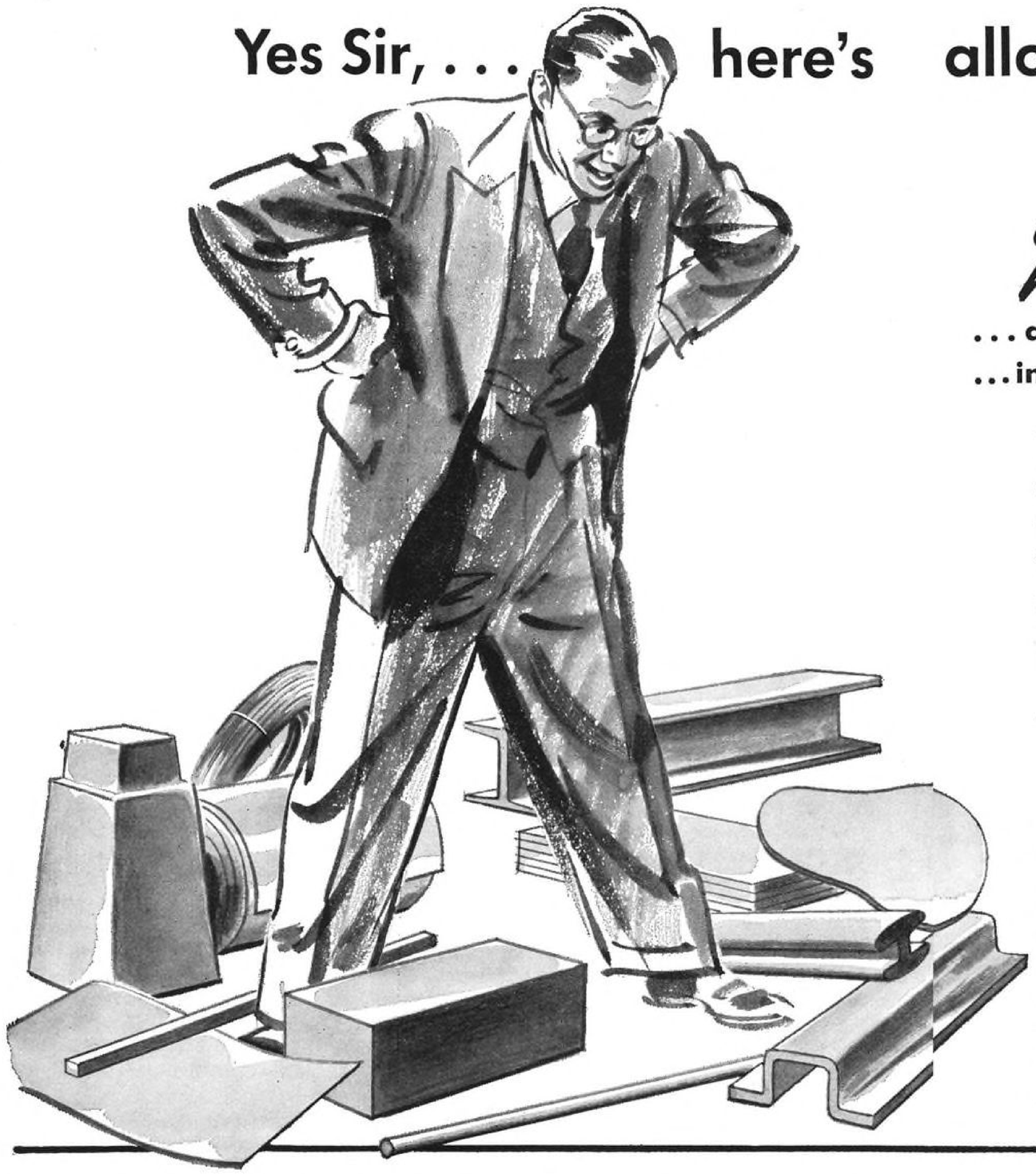

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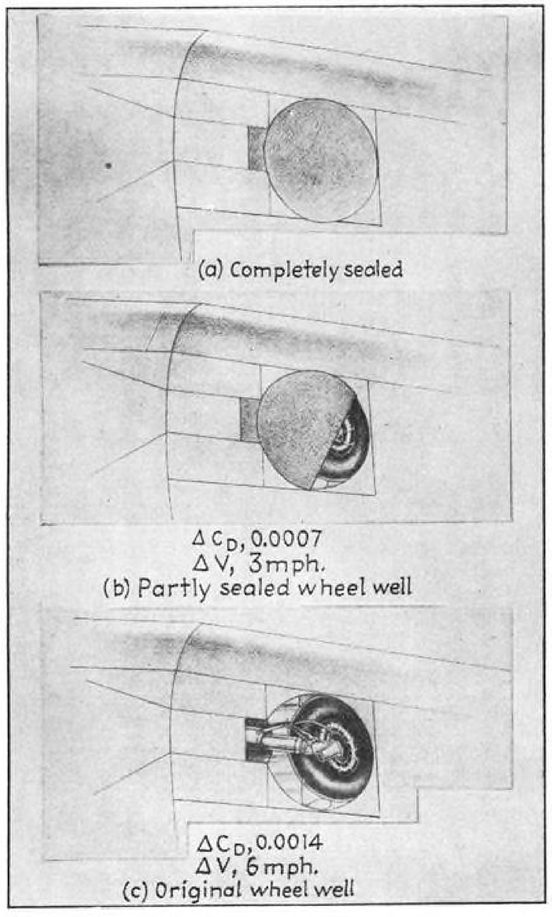
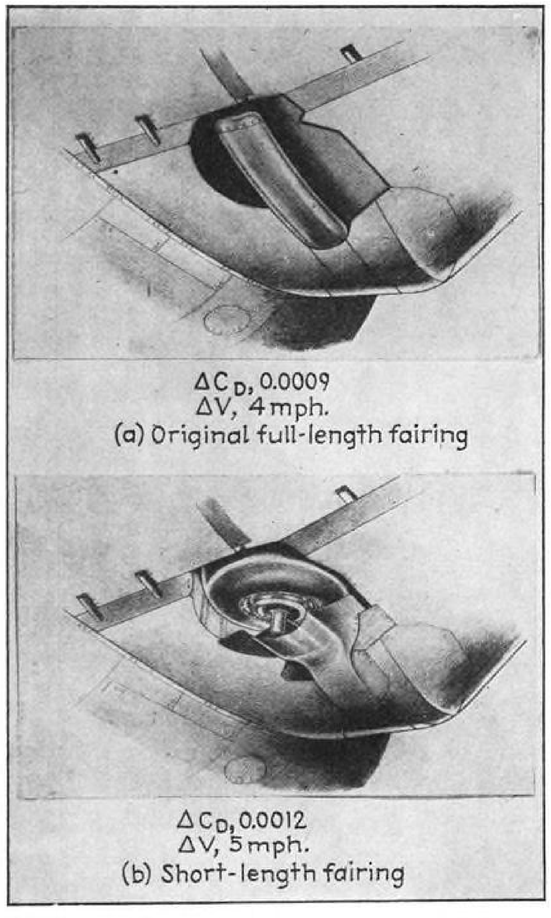
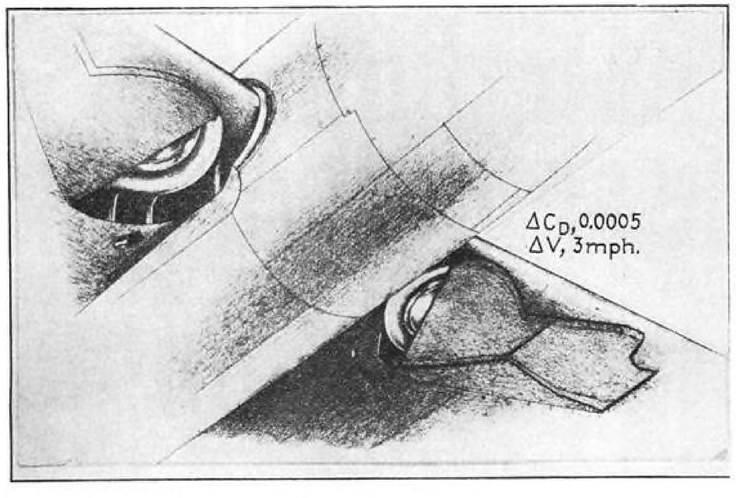
Searching Drag Studies Check Speed Impeders

Outlined are investigations of three landing gear installations — detailing effects of full and partial sealing of wheel well, and sealing of fairing edges.

Part V



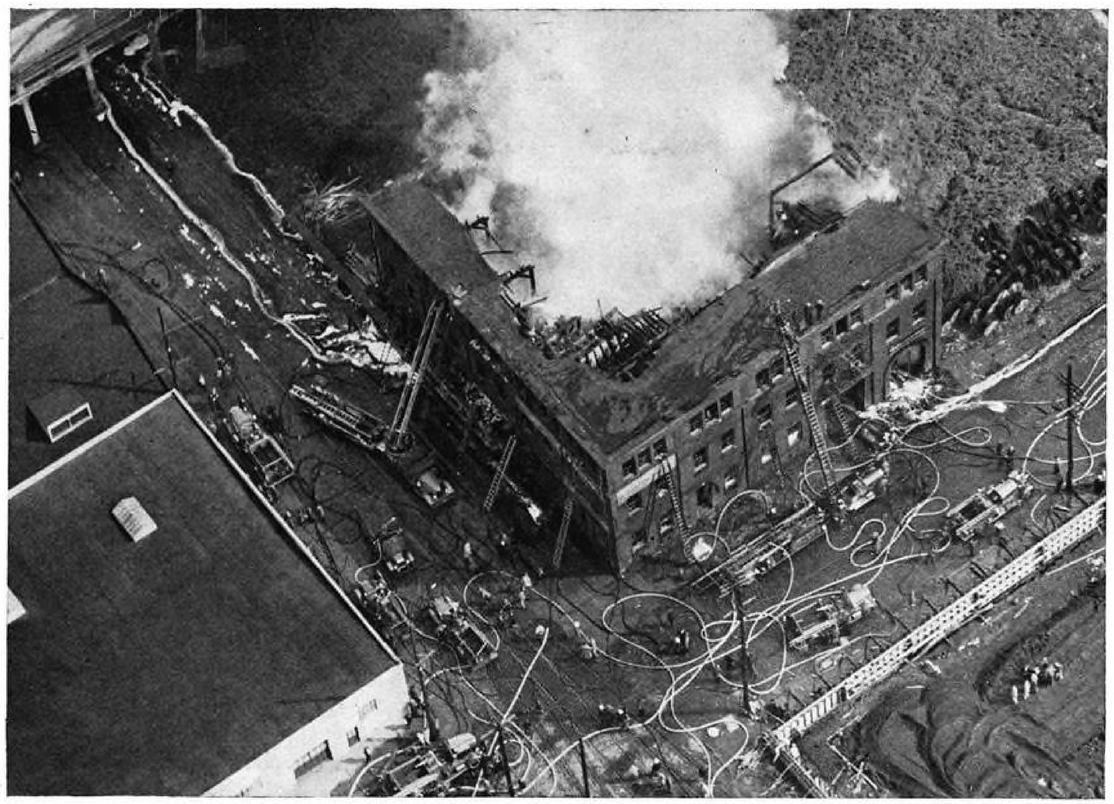




High drag of installation at upper left indicates importance of sealing open wheel wells. Complete sealing of well decreased drag coefficient by 0.0014, and partial sealing decreased coefficient by 0.0007.

Partly open wheel wells on this craft (left) accounted for drag coefficient increment of 0.0005—measured when cover plates were removed from exposed section.

Removal of seals from edges of original full-length fairing (upper right) over retracted landing gear on this plane increased drag coefficient by 0.0009—indicating that air was leaking through $\frac{1}{8}$-in. cracks at these points. Short-length fairing (adopted for production craft) increased drag coefficient 0.0012 over that measured for completely sealed fairing. This drag results from both air leakage and airflow disturbance by exposed parts. Data show importance not only of installing fairing over wheel but also of completely sealing wheel well opening.

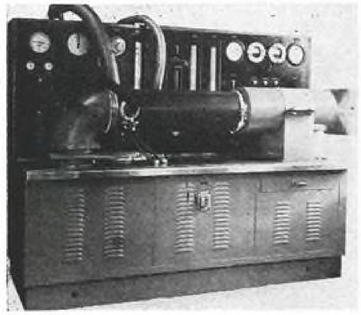


'copter photo of warehouse fire, Portland, April 9, 1947. Courtesy *Oregon Journal*

NEW AVIATION PRODUCTS

Machine Tests Aircraft Heaters

Unit to test heaters used in modern aircraft is in production at **Greer Hydraulics, Inc.**, 454 18th St., Brooklyn 15, N. Y., and first one has been delivered to American Airlines. Designated Model JH-1, machine employs two temperature gages, four manometers, a fuel-flow meter, two fuel pressure gages, two air gages, and voltmeter and ammeter. It has adapters so that various model heaters may be mounted for checkup. High-speed blower simulates flight airflow conditions during test, and pressure-feed fuel system and ignition setup duplicate those used on aircraft. Equipment is explosion and fireproof. Accompanying illustration shows Janitrol heater, as used on DC-6, fitted on unit for test.



Speeds Shading of Tracings

Doubletone tracing vellum, developed to enable quick application of two different shadings on the numerous tracings required in wartime aviation industry, is now on commercial market. Special colorless chemical brings up tones from sheet. Maker, **Craftint Mfg. Co.**, E. 152nd St. at Collamer Ave., Cleveland 10, offers this vellum in two types —"Regular" for tracings to be reproduced by contact printing, blueprint, Ozalid, or similar methods; and "O. S." for reproduction by offset, rotogravure, or letterpress.

Information Tips

Movie About Transparent Plastic

"Looking Ahead Through Plexiglas" is 16-mm. educational film which advertising department of **Rohm & Haas Co.**, Washington Square, Philadelphia, Pa., has made available on free-loan basis to manufacturers, engineering and design groups, schools, and clubs. Running 30 min., motion picture depicts highlights in development of the transparent plastic from basic raw materials to finished product and its employment in aviation and other fields. Special scenes show rigid performance tests to which Plexiglas is subjected.

Meteorological Equipment Described

Wind velocity and wind direction instruments made by **W. & L. E. Gurley, Troy, N. Y.**, are pictured and described in new 20-page Bulletin 6000 issued by company. Meteorological units covered are electronic and d.c. anemometers; high capacity, moderate capacity, and d.c. type wind direction instruments; the graphic recorder; and pilot balloon theodolite. Included are specifications for transmitters, receivers, calibrators, and indicators.

AVIATION SALES & SERVICE

Two Eastern Aircraft Operators Get Goodyear Amphibians On Loan

Atlantic Aviation and Northeast Aviation selected to receive first of 10 planes placed for unique service test to determine market potential.

By ALEXANDER McSURELY

First two of 10 Goodyear three-place amphibians which are to be loaned to aircraft operators are being placed with Atlantic Aviation Corp., Teterboro, N. J. and Northeast Aviation Co., Portland, Me., while the other eight planes in the unique service test program will be loaned to other operators in the Middlewest, South and West Coast areas.

Meanwhile, Goodyear Aircraft Corp., Akron, Ohio, will operate five additional GA-2 planes to compile additional service performance data. Final tabulations of the service test reports, plus additional production cost studies probably will determine whether Goodyear will enter a refined version of the amphibian in the personal plane market when the market begins it eventual expected comeback, or shelve the plane permanently.

Nine of the planes were well on the way to completion, and the remainder were following along on the assembly line when the writer visited the plant last week so that the limited present production program for the GA-2 is already nearing completion.

Indications are that these are all the GA-2s that will ever be made. But if reaction of operators and passengers correspond to the favorable reception the plane has had thus far, and if surveys indicate a reasonable market at the price which the plane must require, Goodyear eventually may produce for sale a modified version of the GA-2. It could be a four-placer, depending on how Goodyear engineers can solve the problem of retracting the plane's main wheels. Now they tuck up into wells high on the sides of the fuselage, so that the wells restrict the width of the rear seat to one passenger. Another possibility under consideration is to use an extension shaft from the propeller mounted atop the wing, ahead of the trailing edge, down to the engine, located in the fuselage. But Ed Burn, Goodyear engineer in charge of the "Duck" development, likes the safety factor of the propeller's present position, so that it will probably remain where it is, out of the way of even the more careless pilots and passengers regardless of the type of engine installation.

Principle criticism, and there is only one, is that the plane is too noisy, an inherent fault of pushers, and needs attention to sound reduction. The amphibian's design goes back to J. Byron Jones, former Goodyear engineer, who developed the original GA-1 and previously had shared in the design of the experimental Applegate amphibian which was once a Piper project. Burn, former director of engineering for Aeronca, took over the Duck project when Jones left Goodyear, and has refined the original plane considerably, and increased the power, although the GA-2 still retains the basic dimensions and design features of the GA-1. (Wing spread 36 ft.; length 26 ft.; height 9 ft. 4 in.; all-metal construction except fabric wing cover.)

Of unusually sturdy construction compared to most contemporary light planes of its size and power class (145 hp.) the GA-2 weighs 1,450 lbs. empty. Has a gross weight of 2,200 lbs., and the wing loading is comparatively high for a light plane, 12.3 lbs./sq. ft. The plane is reported stressed for use of engines as high as 185 hp. It seems indicated that if Goodyear elects to produce a similar plane, in quantity, it will be lightened considerably, and the rather orthodox construction design of both hull and wing will be simplified to take advantage of new production design shortcuts.

However, the airplane is now outstanding in performance for a small amphibian. It cruises at a respectable 110 mph. at 60 percent power, has a top speed of 125 mph. and a 600 ft. (min.) rate of climb. Range fully loaded is reported 300 miles, and it lands around 55 mph. Goodyear does not want to sacrifice this for production shortcuts.

Up to date, Goodyear pilots have put approximately 500 flight hours on the GA-2s, with the bulk of the flying being done by Chapman. As a result of his flight

A-26s GO CIVILIAN

Interior of five-place cabin installed in former bomb bay area of Douglas A-26 attack craft—one of five such planes in conversion program at Lockheed Aircraft Service's Burbank base. With cruising speed exceeding 300 mph. and range of 2,500 mi., luxurious business model will be fastest executive-type plane. Seen is aft divan and interphone junction box. Included are sound-proofing, controlled heating and ventilating, lavatory, wardrobe, and table. Three craft have been completed and fourth is in process for Superior Oil Co. Fifth is being converted for Stanolind Oil & Gas Co.

experience Chapman has prepared a series of report forms which the operators who receive the planes on loan are asked to use, in reporting to Goodyear on how the plane has been used and how it performs. The operators agree that at least half of the flying done with the amphibian is to be water flying. The reports include two daily sheets, one a pre-flight inspection, considerably more thorough than many of the more careless operators give their planes customarily, including engine inspection, cockpit check, airframe inspection, and engine runup report, with space for remarks on any unusual conditions. The other daily sheet calls for a description of the flights made, passengers carried, landings made on land or water, flight time, and fuel and oil consumption and cost. Each week the operator tabulates the daily reports on a weekly operational costs sheet, which shows flight time, fuel and oil consumption and cost, maintenance, repair, materials, storage and land and water landings, with a space for comments.

With 10 airplanes operating in widely scattered areas of the country, by independent operators who are not connected with Goodyear's test pilot staff, Chapman is confident that the planes will get a much more typical service usage, comparable to that which they would receive if they were being sold to all comers. The reports will be tabulated at Akron, and any repetition of trouble in any part of the airplane, indicated by reports, will be watched carefully for possibility of redesigning the airplane to remedy it. The end result, Chapman believes, will be an airplane which will be unusually trouble-free.

Examination of the GA-2 reveals a number of interesting design features. The instrument panel has a wide flat top surface, almost like a narrow desk, where the pilot would put his maps or papers. The plane has a wide door on the right side, and is easy to enter, with a single step between the ground and door. Seating width and leg room are adequate in the front seats, and single back seat. Landing gear retracts electrically, and wheel wells are placed high above the water line so that problems of sealing the wells against water entrance are limited only to possibility of spray entering. The GA-2 is the only plane its size we know which retracts its tailwheel as well as its main gear. Colored plastic in the overhead windows lessens the danger of sunstroke, and the plane like most pushers has excellent visibility. This is an especial advantage in demonstrating Goodyear's new pet light plane accessory, still not on the market, the castering wheel for crosswind landings. It looks even stranger from the cockpit, to see the wheel tilt at crazy angles, than it does from the ground. Wingslots give the GA-2 good aileron control in stall condition. The hull is an NACA design which gives the plane excellent water handling characteristics, which were emphasized by Chapman's skillful handling.

BRIEFING FOR DEALERS AND DISTRIBUTORS

BONANZA AUXILIARY TANK—A third more fuel capacity for the four-place Beech Bonanza is provided by a new 20 gal. auxiliary fuel tank which the company is prepared to install as optional equipment in the luggage compartment. Bud Hulsman, Goodyear Aviation Products salesman, has the first one in the company-owned Bonanza which he flies. For the salesman-pilot who seldom carries a full complement of four persons in the plane, the installation gives the plane approximately 1½ hrs. more range so that he can make a lengthy flight, at least partly under instrument conditions, and still have enough reserve fuel for an alternate landing field. The 120 lbs. extra weight of the fuel limits the luggage allowance in the compartment, but the tank itself occupies only a small part of the compartment, so that there is plenty of baggage room, if the weight allowance is not exceeded.

WHEN GI PROGRAM ENDS—Two qualified observers of the present commercial aviation picture say that only the GI flight training program is keeping many aircraft operations going. They are fearful that the slackening of flight training in the witner months may prove disastrous for some, while the end of GI training will close many others, they predict, unless some unexpected upturn intervenes. Hardest hit will be two classes, the operators who are still waiting for business to come to them and who aren't out "beating the bushes" for any possible new business, and the operators who became overextended in inventory back in the heydays of 1946 and have never yet regained a favorable liquid position in assets. On a basis of recent field trip observations the operators who are distributors and dealers for Stinson, Beech, and Cessna, generally speaking, appear to be more aggressive in sales efforts, and as a result, in better position to ride out the slack personal plane market season, than do many of the operators representing other companies, the observers opine.

EXPENSIVE ECONOMIES—Aircraft operators who practice false economy by failing to order necessary spare parts in advance of actual needs and who then have to fly a plane to the nearest distributor to get a part or tie-up the damaged equipment on the ground until the part can be shipped on order are adding to their own operating costs by such methods. The keeping of records on equipment which makes it possible to anticipate part failures and replace them in advance and ordering replacement parts well in advance of actual needs are two sound business practices which every successful surface transportation operator follows as a matter of course. The men who operate airplanes would be more successful if they would do likewise.

FIRESTONE NOSE GEAR—Firestone Aircraft Corp. has an interesting new nosewheel landing gear with a "knee-action" joint which is being flown experimentally on a company-owned Ercoupe at Akron. It is a further step in the Firestone engineering program on landing gears which developed the rubber spring superflex landing gears, and a steerable tailwheel. These and several other Firestone-developed projects are expected to be licensed soon to other manufacturers if negotiations now in progress are completed. As indicated in a recent announcement, Firestone is suspending most of its own manufacturing of light aircraft equipment and presumably the new Firestone crosswind gear for tricycle planes, a variation of the superflex gear, also will be eligible for licensing.

GOODYEAR COST STUDY—Most successful of the crosswind gear projects, the Goodyear crosswind wheel, although it has been certificated for manufacture by CAA, is still not assured of production. A cost study and more engineering efforts to bring production cost down are the next steps for the castering wheel. A small quantity of crosswind wheels are being prepared for distribution to various lightplane manufacturers who have shown interest in using the gears experimentally on their planes. Results of these experimental installations and manufacturers demands probably will be a large factor in the final decision. Meanwhile Goodyear is moving ahead on two other adaptations of the crosswind wheel to other types of planes besides the original Piper Cub installation, and the GA-2 amphibian installation. One of these will be on a tricycle-gear plane and the other on a DC-3 transport.

CUSTOMER QUESTIONNAIRE—In addition to the forms which Art Chapman, director of the GA-2 service test program is sending out to the operators who will use the amphibians (see lead story sales and service section) Art is asking the operators to get their passengers to fill out a short form, stating their reactions to the GA-2. Questions include: "Do you find that the GA-2 will meet your requirements for: business, sport and pleasure flying? Considering this type of aircraft and the utility it affords, at what price would you purchase one?" And a third question directed at fixed base operators who may be among the passengers: "Approximately how many units of this type aircraft do you feel you could sell at the price noted, in your territory, per year?" Additional space is provided for suggestions and criticism.

—ALEXANDER McSURELY

Emergency Airport Inaugurates Program

Contract has been awarded for the first of three emergency airports sponsored by the Washington State Aeronautics Commission in cooperation with CAA.

Bandera Emergency Airport, located approximately 15 miles east of North Bend, Wash. in the vicinity of Snoqualmie Pass, will consist of a turf strip landing area 2400 × 300 ft. with an additional 300 × 70 ft. plane parking area. Boundary markers, wind cone, tetrahedron, circle marker, and register stand with first aid equipment and fire extinguisher are to be installed at field. Contractors M. P. & W. J. Halleran estimate the work will cost $67,799.56.

Limited gas and oil supplies will be available at an adjacent garage. Telephone for emergency calls will also be provided.

Kay Appointed Charts Assistant to Wright

Appointment of John D. Kay of the Coast and Geodetic Survey to the position of assistant to the administrator for Aeronautical Charts was announced today by T. P. Wright, Civil Aeronautics Administrator. Kay was assistant chief of the Survey's aeronautical chart branch.

Wright also announced appointment of William Gardiner Fuller and Marlboro K. Downes as chiefs of the airports management and program performance divisions, respectively, of the office of airports.

Post $1,500 Prizes For New Glider Records

Prizes of $1,500 for a new glider distance record—over 340 miles—and $500 for a new altitude record—over 20,500 ft. —have been posted by the Elmira Area Soaring Corp., Elmira, N. Y.

Takeoffs for both flights must be made within 15 miles of the center of Elmira, N. Y., and flights are to be made under rules and regulations set by the corporation and approved by the Soaring Society of America.

Two Sales, One Photo Get State Charters

Senix Aerial, Inc., Eastchester, N. Y., has been chartered with $10,000 capital in $100 shares, to engage in aerial photography. Directors and subscribers are Don and Ellis W. Pruess of Mt. Vernon, N. Y., and David W. Pruess, Hartsdale, N. Y.

Andrews Flying Service, Inc., Georgetown, S. C., has been chartered to deal in airplanes with $25,000 authorized capital stock. D. D. Overton, Jr., is president.

Lakeview Speedway, Inc., Lexington, N. C., has been chartered to deal in airplanes with authorized capital stock of $50,000.

Proposed as replacements for painted rooftops, these new beacons are capable of service with three degrees of intensity, and can be seen up to 20 miles away at night.

New Airport Markers Pioneered by Minnesota

A new system of continuously operating airport beacon markings, designed to aid cross country flyers and eliminate the use of town names painted on rooftops, is being pioneered by the Minnesota Department of Aeronautics. Two test beacons are at Flying Cloud Field, near Minneapolis, and Municipal Airport at Marshall, Minn.

The equipment is manufactured by the Line Material Company of East Stroudsburg, Pennsylvania.

L. L. Schroeder, State Commissioner of Aeronautics, regards the small airport beacons, for which he is seeking CAA approval, as a more satisfactory system of airport markers than the familiar painted rooftop system. Schroeder sees considerable danger in such markings because they invite pilots down to unsafe altitudes in order to read them. Under unfavorable weather conditions, he says, they could cause pilots to fly into obstructions. Schroeder proposes that the state's 90 publicly owned airports all have the new beacons.

With three degrees of intensity, the beacons are constructed like sealed beam lamps, similar to those in automobiles, thus making it a simple matter to repair them. They would revolve 24 hours a day. Those installed on airports equipped for night flying also would have a lamp directed upwards as a ceiling height indicator.

Installed cost per unit would range from $350 to $370, of which the state of Minnesota proposes to pay half. Cost of operation is put at $5 to $8 a year.

On a reasonably clear night, the beacons can be seen from the air for a distance of 15 to 20 miles and about 15 miles in the daytime. When they are located among other lights, the beacons can be picked out from the air eight to ten miles away in sunshine, and 15-20 miles away at night.

Bricker Named Auditor For Southwest Airmotive

Appointment of John C. Bricker as auditor for the Southwest Airmotive Company, Dallas, Texas, has been announced by company officials. Bricker was formerly office manager for Henry C. Beck Co., Dallas.

Bricker

Meanwhile, Southwest Airmotive sales division at Dallas has contracted with B. F. Goodrich Co. to be their distributor in Texas, New Mexico, Oklahoma, Arkansas, Louisiana and Mississippi. Now ready for distribution in SAC warehouses are products representing the complete Goodrich line. In addition, the SAC service division is prepared to install, repair and overhaul all Goodrich items.

County Air Mapping

Snohomish County commissioners at Everett, Wash., voted an emergency appropriation of $10,000 to have the county mapped from the air by Pacific Aerial Surveys, Inc., of Seattle.

It is felt that the use of aerial photographic maps will be of considerable aid to the county assessor and engineer. The assessor will use the photographs to locate logged off land and heretofore unlocated improvements for assessment purposes and the engineer to locate roads.

Neighboring King County made such a survey before the war and collected in taxes more than the initial expenditure by locating many buildings and homes that were not known to have existed. Pacific Aerial Surveys recommends new survey each ten years.

SEA–AIR RESCUE

Ditched Aeronca Chief, sighted through periscope of submerged U. S. Navy submarine Finback, is hoisted ashore at New York, Conn. Pilot was rescued when sub surfaced and picked him up. (International News photo.)

Moscow Report Lifts Curtain On Soviet Civil Aviation Growth

Civil airways, expanded five-fold in past 15 years, now total 93,00 miles; 1947 passenger and freight traffic expected to reach five times prewar figure.

Latest photos show interior and exterior of Soviet IL-12.

Sovfoto

BY ANDREW STEIGER

MOSCOW—Soviet air strength is coming of age. Now operating 93,000 miles of internal civil airways, the Soviet Union ranks among the world's two greatest air powers in civil air service, as well as military air might.

"Soviet air transport holds first place in the world for the length of air lines and the quantity of air freight carried, and second place for passenger traffic," it was recently stated by Air Marshal F. Astakhov, chief of the Soviet Civil Air Fleet Administration. He added that "Passenger traffic by 1950 should be 14 times greater than it was in 1940." He did not say what the 1940 figure was.

During the past fifteen years, Soviet civil airways have expanded nearly five times over, and are being extended. This year alone, about 7,500 miles of lines opened.

► **Exceeds Other Transport**—The mileage of Soviet airways is greater than that of any other form of internal transport in the Soviet Union, whether rail, road or waterway.

One main trunk airline extends from Moscow across Siberia to the Pacific, with stops at the main junctions of the Trans-Siberian railway. Another reaches across the Southern Urals from Moscow to Tashkent and Alma Ata. Trunklines reach from Moscow north to Leningrad, west to the capitals of the Baltic States, to Minsk and Kiev, and south to the Caucasus. A new airway is being opened to link Tbilisi with Odessa via the Black Sea ports Batumi, Sochi and Sevastopol.

Moscow, the heart of the Soviet civil airways system, is connected by air with the capitals of the 16 republics in the USSR. Planes taking off from Moscow reach the capitals of fourteen of these republics on the same day.

► **Expensive Trip**—The most expensive air trip one can take from Moscow is the flight to Anadyr on the Bering Strait opposite Alaska. The passenger ticket costs 3,880 rubles, the equivalent of five months' pay to the average citizen. For internal lines the luggage limitation is 55 lb. per passenger; 11 lb. free carriage. For international lines, the baggage limitation is 132 lb.; 33 lb. free.

Air passenger and freight traffic of Soviet airways this year is expected to reach a total five times greater than prewar level. Total passenger haul in 1947 is expected to top by 400,000 the 1946 mark. During the first nine months of 1946 the Soviet civil airways were reported to have transported 230,000 passengers and about 30,000,000 pounds of air freight.

Flying from Moscow's two main airdromes, regular civil airway planes connect the Soviet capital with about 80 cities, including 15 outside the Soviet Union. In 1946, 30 planes daily were landing and taking off from the capital.

► **Moscow's Major Airport**—The civil airport at Vnukovo, 25 miles from Moscow, is the city's major airdrome both for internal and for international airlines.

Operating on a 40-minute express schedule, large comfortable motor busses ply between the Soviet capital and the airport. Every day Vnukovo now services more than 1,500 air travelers, among them many who arrive from and depart to foreign lands. Customs inspection is also carried out here for passengers arriving from abroad. Airfreight is dispatched and received at Vnukovo field.

Russians do not follow the American practice of using safety belts in taking off and landing. Nevertheless, chief of the Civil Air Fleet Astakhov stated recently that "judging by available statistics Soviet air transport ranks first in the world for safety of air travel."

All pilots of the civil air planes are skilled airmen, many with distinguished wartime service and some with phenomenally long civil service records. Among the pilots operating out of Vnukovo are several "million-milers."

► **Civil Aircraft**—The majority of the civil air fleet transport and passenger planes at present are Russian-produced DC-3s, but a new plane identified as the "IL-12" which has been developed by S. I. Ilyushin designer of the famous "Stormovik" bomber, seems earmarked to replace these planes on trunk lines. The "IL-12" which seats 27, is reported to develop a speed about 60 miles faster than the Douglas planes.

Successful test flights have been made on long distance swings out of Moscow. A larger passenger transport seating 70 persons has been developed by the noted Russian designer A. N. Tupolev. This plane was first shown publicly at the Aviation Day celebration Aug. 4.

The Aviation Day air show also disclosed a series of jet-propelled planes, designed by seven of the Soviet Union's leading aircraft designers—Yakovlev, Lavochkin, Mikoyan, Gurevich, Sukhov, Ilyushin and Tupolev. To judge from current comment in the Soviet press, jet-propulsion is a field with which Russian aeronautical engineers have long been familiar. "The modern airplane is the material expression of the latest achievement in Scientific thought," stated a recent *Pravda* editorial, adding: "Our native land which first gave the world the scientific theory of flight and then the theory of jet-propelled motion has made a great contribution to the rapid progress of aviation. The development of aviation techniques, the application of jet-propelled engines, the increase of speed, distance and altitude of aircraft flights, the utilization of radar—all set new tasks before those who design and build aircraft as well as those who fly in them."

► **Regional Airways**—For all main trunklines the Soviet aircraft industry, which during the war developed an output capacity of 40,000 planes per year, is to supply multi-seat fast transports. Light machines simple to pilot and to service are to be produced for the local airlines. Main trunklines link the major cities in the national network, while local airlines branch out from major centers to reach the small towns.

One of the problems still only partially solved by the civil air authorities is the paving of good roads and the establishment of good normal transport between the airports and the cities they serve. Whereas the city and airport communications in Moscow and other centers are satisfactory, it takes about as much time, for instance, to get from the Leningrad airport to the city by available surface transport as it does to travel by air from Moscow to Leningrad.

► **Multi-Purpose Use**—Apart from transport of passengers and air freight, planes of the Soviet civil air fleet perform an estimated 60 special functions.

Civil air pilots keep watch over high-tension power transmission lines to facilitate speedy repair work. Ranging the seas, they scout out schools of fish for the fishing fleet. In the Arctic ice patrol they search the pack for lanes, guiding ice-breaker convoys. In rural areas remote from rail and waterway they transport tractors, seed and farm implements, bring in young fish to stock farm ponds and carry incubated chicks to help build up poultry yards in war-devastated farms. For planting in the Ukraine, they transported seed for kok-sagyz rubber plants from Central Asia. In Central Asia civil airmen perform cowboy service driving herds of cattle to pasture.

Trains Are Favored

Survey Shows Slight Decline In Enthusiasm For Air Travel

Young people and recent users continue to be biggest boosters of plane transportation, according to study made for Association of American Railroads.

The growing trend in public preference for air travel which continued through the war years has been halted, and railroad transportation has gained slightly in passenger favor, according to results of a recent nationwide survey.

Air transportation is still increasing its appeal to persons under 30, the study disclosed. But the airlines apparently have a major problem in boosting their popularity among older people, lower income groups, residents of rural areas, women and large segments of the population in the South and Middle West.

► **Majority Favors Trains**—Of 2,583 persons interviewed by the Opinion Research Corp. for the Association of American Railroads, 51 percent said they would prefer to travel by train if fares are equal. Forty-four percent expressed preference for air transportation, and 5 percent were undecided. Among the 2,583 respondents, 282 said they had used the airlines recently, and 2,301 said they had not.

In a similar study made last year, 49 percent of those interviewed preferred rail transportation, 46 percent air travel, and 5 percent were undecided. While the airlines lost 2 percentage points between 1946 and 1947, they held most of the impressive gains made between 1943 and 1946. During that period, public preference for rail travel dropped from 61 percent to 49 percent as air transportation increased in favor from 35 percent to 46 percent.

► **Air Travel Enthusiasts**—The research organization emphasized that despite their gain in favor with the public generally the railroads have not improved their standing with the two groups which have consistently been most enthusiastic about air travel—young people and persons who said they had made a commercial flight recently. In 1946, 62 percent of the interviewed persons under 30 years of age preferred air travel to rail transportation, while in 1947 the figure increased to 65 percent. Thirty-one percent of the younger age group now favor rail travel, and four percent expressed no opinion.

Among persons of all ages who had made a recent commercial plane flight, 81 percent favored air travel against 79 percent last year. Only 13 percent of the respondents who had flown recently favored railroad transportation in this year's survey, and 6 percent were undecided. But among those who had not flown recently, 55 percent preferred rail travel against 40 percent for air transportation while 5 percent stated that they were undecided.

► **Income Groups Studied**—While 65 percent of the interviews with persons under 30 years of age showed a preference for air travel over rail transportation, the figure dropped to 45 percent in the 30-44 age group and to 33 percent among people 45 years old and over. Whereas 47 percent of the respondents in the upper and middle income groups favored air travel against 48 percent for rail transportation, only 37 percent in the lower income bracket preferred air travel compared to 57 percent favoring rail transportation.

In cities of 100,000 population or over, 54 percent of those interviewed favored plane travel and 41 percent rail transportation. But in communities with between 25,000 and 100,000 population the percentage favoring air travel dropped to 51 percent. In towns of 2,500 to 25,000 population air preference was only 41 percent and in rural areas, 37 percent.

► **Women Less Favorable**—Of 1,468 men interviewed, 47 percent favored air travel if fares were equal and 47 percent rail transportation, with 6 percent undecided. Only 40 percent of the 1,115 women interviewed expressed preference for air transportation, against 56 percent for rail travel and 4 percent undecided.

Residents of the far West appear to be most enthusiastic about air transportation. Fifty-four percent of the persons in this area favor planes, 40 percent prefer rail travel, and 6 percent are undecided. In the East, 46 percent prefer plane travel (48 percent rail); Middle West, 44 percent plane (51 percent rail); and in the South, 30 percent plane (66 percent rail).

► **Safety Factor**—The public regards rail transportation as preferable to air travel in three major respects, according to the survey. These are safety, spaciousness of accommodations and dependability. Speed was given as the airlines' outstanding advantage, although the public also believes the air carriers offer a higher quality personal service than the railroads.

Asked which is the safest way to travel, by plane or train, 60 percent of the 2,583

FARMER'S SHOPPING TRIP

An Alaskan farmer who recently made extensive purchases of livestock and equipment in Seattle had his new possessions loaded aboard an Alaskan Airlines C-47 which he rode back to Anchorage. Included in the cargo were cows, calves, pigs, a tractor and other farm gear. Frequent strikes by longshoremen and seamen boomed airfreight business to Alaska last year, and new walkouts again are crippling surface transportation.

respondents favored the railroads against 13 percent for the airlines. Twenty percent said the two modes of transportation have about the same degree of safety, while about 7 percent were uncertain.

► **Groups Studied**—Among the 282 persons who had used the airlines recently, 33 percent felt trains are safer, 27 percent favored planes, 29 percent believed chances of mishap are about the same, and 11 percent were uncertain. In contrast, 63 percent of the 2,301 persons who had not used air transportation recently believe trains are safer, 11 percent favor planes, 19 percent said they are about the same, and 7 percent were uncertain.

Fifteen percent of the men believe the airlines are safer, 59 percent favor the railroads on this count, and 19 percent think both have about the same degree of safety. Only 9 percent of the women interviewed believe the airlines are safer, 61 percent said the railroads are safer, and 21 percent think they are about the same.

► **Opinion By Ages**—In the upper income group, 16 percent believe the airlines are safer than the railroads, but only 10 percent of the lower income group agree. Nineteen percent of all respondents under 30 years old think planes are safer than trains, against 14 percent in the 30 to 44-year-old group and 9 percent among persons over 44 years old.

Whereas only 9 percent of those interviewed in rural areas said air transportation is safer than rail travel, 16 percent of those living in cities of over 100,000 population took that view. In the South, 6 percent of the respondents think plane travel is safer than rail, in the East 12 percent, in the Middle West 15 percent and in the Far West 16 percent.

► **Recent Crashes Not Factor**—Since the survey was conducted in late April and early May, the results were not affected by the three DC-4 crashes which occurred in late May and early June.

Asked what they liked best about plane travel, 40 percent of the 2,583 persons interviewed mentioned speed, 7 percent cited comfort, 4 percent cleanliness, 3 percent better service, 2 percent said it was generally more enjoyable, and 1 percent mentioned convenience, scenery or free meals. While some persons cited more than one advantage, 56 percent (many of whom had never traveled by air) could think of no reason for using plane transportation.

► **Fine Points Listed**—When asked what they liked best about rail transportation, 35 percent of the respondents mentioned more space, 27 percent cited safety, 10 percent convenience, 9 percent scenery, 7 percent dependability and 2 percent said it was cheaper or that there is more companionship on trains. Twenty-four percent failed to cite an advantage for rail transportation.

Thirty-nine percent of the public believe trains are more comfortable than planes, the survey indicated, while 35 percent favor air travel on this score, 5 percent have no preference and 21 percent are undecided. Asked which is the most certain to get one to his destination at the expected time, 60 percent said trains, 24 percent airlines, 7 percent had no preference and 9 percent were undecided. Among those that had used the airlines recently, 51 percent believed the railroads are more dependable, 28 percent favored the airlines and 12 percent had no preference.

Airlines have more friendly and courteous employes, according to 36 percent of the persons interviewed; 9 percent said the railroads are better in this respect, 16 percent declared there is no difference and 39 percent were uncertain.

Pullman Plea

The Pullman Company has sought Interstate Commerce Commission authority to raise sleeping car fares up to 49 percent, but if the increase is granted it probably won't switch many passengers to air travel.

Largest increases proposed apply to short trips. No boosts were requested on sleeper tickets that now cost $17.70 or more, and present seat charges for both sleeping and parlor cars would be retained. Revenue from sale of Pullman accommodations and charter of cars declined from a wartime peak of $158,000,000 in 1944 to $127,000,000 in 1946.

Braniff Gets DC-6

Braniff Airways has received the first of six DC-6 sleeper planes to be used on the company's Latin American routes. Carrier hopes to inaugurate international operations this fall.

UAL Eyes Inland's Link to Twin Cities

United Air Lines, which last week was slated to begin operations over the Denver-Los Angeles route recently acquired from Western Air Lines (AVIATION WEEK, Sept. 1), is seeking means to reinstitute the one-carrier through service between Minneapolis-St. Paul and Los Angeles formerly furnished by WAL and its subsidiary, Inland Air Lines.

W. A. Patterson, UAL president, has announced willingness to achieve the through service by either of two methods—purchase of Inland's Twin Cities-Denver route or working out an arrangement with Mid-Continent Airlines to fly over its system from Omaha to Minneapolis-St. Paul.

During the hearing before CAB on UAL's acquisition of Western's Denver-Los Angeles link, Patterson stated his company would purchase the Inland route to the Twin Cities if CAB would set the price and approve the deal. In a recent letter to J. W. Miller, Mid-Continent president, Patterson re-emphasized his interest in negotiating for Omaha-Twin Cities flying rights as an alternative should he not be able to acquire the Inland route.

Tigers' Work Extended

The Flying Tiger Line's contract with the Army Air Transport Command for trans-Pacific operations has been extended to Dec. 1, according to Robert W. Prescott, president. Since commencement of flights on Jan. 15, 1947, the Tigers have recorded nine million plane miles, 124 million passenger miles and 33 million ton miles. The carrier operates ATC C-54s with crews numbering six men which make the daily service trips to Tokyo.

REJECT "LOW CEILING" ON HEMLINES

Putting the taboo on anti-"CAVU" fashion trend, American Airlines stewardesses have vetoed half-calf skirt length and will maintain altitude no lower than two inches below knee—depending on individual height. Claim is shorter uniform looks smarter and is more comfortable. Glance at comparative photos (style back in '30s seen at right) probably shows why passengers aren't squawking.

Equipment Interchange Agreement Endorsed

Approval of an agreement by which TWA and Delta Air Lines would interchange equipment at Cincinnati, Ohio, has been recommended to CAB by Examiner Herbert K. Bryan. The proposed operation would provide new one-plane service between Detroit, Toledo and Dayton, served by TWA on AM 58; and Atlanta, Miami and other points in the South and Southeast served by Delta's AM 24 and 54.

Both carriers agreed to lease to the other whatever planes might reasonably be required to complete through schedules. Although the pact provides for leasing of equipment by each party, at the outset it is planned that only Delta's aircraft will be used, with TWA crews taking over Delta planes at Cincinnati for the northward run to Dayton, Toledo and Detroit.

ICAO Council Holding Session In Montreal

Second council session of the International Civil Aviation Organization was slated to open last week in Montreal with the 21-nation group to receive progress reports on ICAO's campaign to cut down the red tape of customs and immigration which hampers international airlines.

The council also will examine the comments of member states on the desirability and practicability of international ownership of all trunk airlines. It will discuss the special problems of nonscheduled international operations.

Other items on the agenda include a study of ICAO's machinery for collection and dissemination of air transport statistics; problems of double taxation, insurance, international airmail rates and standardization of airport charges; and consideration of requests from various nations for financial and technical help in establishing and operating navigation facilities necessary for international air transport.

Pan American to Open New Route to Tokyo

Pan American Airways will inaugurate a new trans-Pacific service on Sept. 25 when it begins weekly flights to Tokyo and other major cities on the Asiatic mainland.

DC-4s equipped with sleeperettes (AVIATION WEEK, July 14) will fly the central Pacific route via Honolulu and Wake Island to Tokyo, then on to Shanghai, Hong Kong, Bangkok and Calcutta, where connections can be made with PAA's Atlantic services. First eastbound flight over the new link is slated to leave Calcutta for Tokyo and San Francisco on Sept. 30. Pan American has been operating a weekly trip to Bangkok and Calcutta via Manila since June.

FAST FUELING

An underwing fueling system which will cut Boeing Stratocruiser gas servicing time by more than 60 percent is being made available for the new double-deck transport and will be used in the planes ordered by American Overseas Airlines and Northwest Airlines. The Stratocruiser can be fueled completely with 7,620 gal. of gas in less than 15 minutes with the underwing installation, Boeing states. An engineer is shown attaching a non-spilling nozzle to a specially-designed fuel cell valve on a test rig. Smaller hoses shown on wing are part of test equipment and lead to manometer board.

California Eastern Elects Barrie Vice President

Election of Allan A. Barrie as vice president in charge of operations has been announced by California Eastern Airways, transcontinental airfreight line based at Oakland, Calif.

A former vice president of Western Air Lines, Barrie joined the cargo carrier a year ago and has served as executive assistant to President J. J. O'Brien and as operations manager. During the war he was assistant chief of staff of the Army Air Transport Command's Ferrying division.

Other personnel developments:

• **Air Express International Agency, Inc.**—William V. McTaggart has joined the staff and will assist in developing the company's foreign and domestic cargo forwarding business. He was formerly with Railway Express Agency's Air Express division, Trans Caribbean Air Cargo Lines and Latin American Airways.

• **American**—Edward Doherty, Jr., formerly with TWA and Capital Airlines (PCA) has been appointed to the carrier's public relations staff in New York. Robert L. Smith has become cargo sales representative in the New York City women's garment district.

• **Northeast**—Charles H. McKenney, formerly with American Airlines, has been named passenger sales manager.

• **Railway Express Agency**—James B. Finnin has become manager of Air Express for REA's eastern departments, succeeding R. G. McLain.

SHORTLINES

► **American**—Is now represented in Central America by TACA through a recent agreement providing for exchange of both passenger and cargo traffic. The pact provides connecting service for American to Central and South American points.

► **American Overseas**—Daily nonstop trans-Atlantic service from New York to Shannon, Eire, was slated to be resumed last week. All AOA flights stopped at Gander, Newfoundland, during the summer months.

► **Braniff**—Carried 50,642 revenue passengers in July, 1,500 more than in June. Revenue passenger miles increased from 16,835,448 in June to 16,958,388 in July. All categories of cargo were up for July, with airfreight showing the largest jump—49 percent over June volume...Company is now making reservations at the Stevens, Palmer House and Sherman hotels for Chicago-bound passengers. Under the plan a passenger requests his hotel space simultaneously with his airline reservation.

► **Capital**—Flew 7,738,742 lb. of airfreight in the twelve months ended July 31—its first year of freight operations. During the first quarter of the period, the carrier flew 908,301 lb. against 2,623,751 lb. in the quarter ended July 31, a 160 percent gain in volume ...Company has announced installation of a new system-wide set-up which permits immediate confirmation of reservations even when return, connecting or stop-over passage is involved.

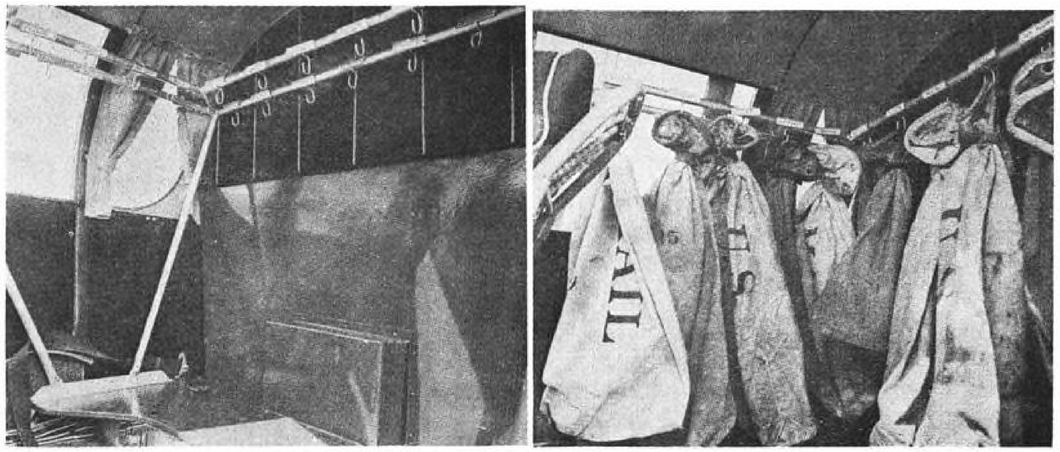
► **Eastern**—Reports it is offering the most frequent service ever flown between two cities in the world by one airline on its New York-Washington run. Company this month increased New York-Washington schedules to 32 roundtrips daily Monday through Friday and 29 daily on Saturdays and Sundays...Interline reservations agreement has been signed with Scandinavian Airlines System.

► **Mid-Continent**—Reports net profit for July of $1,395 against a $35,507 net profit in same month last year. Operating revenues of $519,836 in July were up 2 percent over preceding month and 9 percent over July, 1946. Passenger load factor was 56 percent in July, 1947, against 72 percent in July, 1946.

► **National**—Earned $372,697 net profit during fiscal year ended June 30, compared with $226,538 net profit in the previous fiscal year. Total operating revenue of $11,077,492 nearly doubled the $5,833,421 operating revenue for the preceding year, and revenue passenger mileage was up 80 percent ...Company was slated to extend DC-4 service to Tallahassee, Fla., and Mobile, Ala.

► **Northwest**—Has established a traffic office in San Francisco to tap California cargo business moving to the Orient.

► **Trans-Texas Airways**—Has contracted with Dallas Aero Service for all maintenance service on the company's planes.



UNITED PROPOSED HELICOPTER MAIL RACK

Two views of United Air Lines' helicopter mail rack shows interior arrangement of craft before and after mail is loaded. The rack was designed and built by UAL's engineering department to answer the need for fast handling of mail pouches in helicopter mail service. Photos are part of United's exhibit before the CAB in reference to proposed helicopter mail service in the Chicago area. The carrier, which recently purchased a Sikorsky S-51, has applied for four helicopter mail routes. Further hearings will be held.

Domestic Carriers Still Far In Red

Only three of 16 certificated trunklines show profit for first half of 1947.

Showing an aggregate operating deficit of almost $16,000,000 at the half-way mark, the nation's 16 certificated trunklines apparently are headed for their second consecutive year of record losses.

Only three domestic carriers—Eastern, Inland and National—were in the black for the six months ended June 30 as second quarter operating profits failed to wipe out more than a small fraction of the $18,746,000 deficit suffered in the first three months of 1947. Seven lines showed a profit during the second quarter of this year compared with two in the first quarter.

▶ **1946 Results**—During the second quarter of 1946 the 16 domestic trunklines earned over $5,000,000. This was sufficient to wipe out the first quarter operating deficit and replace it with a profit of almost $900,000 for the six-month period.

The three U. S. flag carriers on the North Atlantic run were all in the black during the second quarter of this year, but two of them —TWA and American Overseas Airlines— had operating losses of $1,536,000 and $1,680,000, respectively for the six months ended June 30. Pan American Airways' Atlantic division was well in the black for the first half of 1947.

Five of the six feederlines active during part or all of the first six months of this year showed operating deficits for the period, although second quarter losses were considerably below those of the first quarter. Southwest Airways had a $444,000 operating loss for the six months ended June 30; Empire Air Lines $208,000; Florida Airways $118,000 loss); Braniff, $270,000 loss ($852,000 Challenger Airlines $60,000. Pioneer Air Lines had a $69,000 operating profit in the same period.

▶ **Breakdown Given**—Second quarter operating results for the 16 domestic trunklines, with six-month figures in parentheses, are: American, $1,404,000 profit ($3,279,000 loss); Braniff, $270,000 loss ($852,000 loss); Chicago & Southern, $80,000 loss ($604,000 loss); Colonial, $137,000 loss ($548,000 loss); Continental, $66,000 loss ($323,000 loss); Delta, $169,000 profit ($110,000 loss); Eastern, estimated $1,980,000 profit (estimated $3,650,000 profit); Inland, $92,000 profit ($25,000 profit).

Mid-Continent, $7,000 loss ($106,000 loss); National, $241,000 loss ($105,000 profit); Northeast, $285,000 loss ($785,000 loss); Northwest, $56,000 loss ($2,182,000 loss); PCA, $31,000 loss ($2,246,000 loss); TWA, $23,000 profit ($3,414,000 loss); United, $254,000 profit ($4,877,000 loss); Western, $263,000 profit ($405,000 loss).

ICAO Weather Study

Preventive measures against aircraft accidents due to temperature accountability will be discussed by a specially formed group of aeronautical experts at an International Civil Aviation Organization meeting in Paris on Sept. 23. The importance of changes in atmospheric temperature and pressure on aircraft performance, underlined by recent airline mishaps, will be only one topic covered by the ICAO group when they consider action to increase the safety of airline flying under extreme weather conditions.

CAB SCHEDULE

Sept. 8. Oral argument in Arizona-New Mexico area case. (Docket 968 et al.)
Sept. 10. Hearing on CAB's investigation of TWA-Hughes Tool Co. relationships. (Docket 2796.)
Sept. 15. Hearing in Chicago Helicopter service case. (Docket 2384 et al.)
Sept. 15. Hearing on Southwest Airways' request for certificate amendment to permit beginning and/or ending trips at points short of terminals. (Docket 2861.)
Sept. 30. Oral argument in Northeast Airlines mail rate case. (Dockets 1932 and 1890.)
Oct. 7. Hearing involving additional Florida area service. (Docket 1668 et al.)
Oct. 20. Hearing on Resort Airlines' application to conduct all-expense "sky cruise" operations. Postponed from Oct. 6. (Docket 2377 et al.)
Oct. 20. Hearing on Pan American Airways' application for route consolidations and extensions in Latin America. (Docket 2811.)
Nov. 15. Hearing on board's investigation of consolidated airfreight tariff agreement. (Docket 2719.)
Nov. 24. Hearing on Mid-Continent's application for alternate Kansas City-New Orleans route. (Docket 1956.)
Dec. 8. Hearing on Mid-Continent's proposed service between Minot, N. D., and Regina, Saskatchewan. (Docket 628.)

Aerovias Brasil Granted New Route Into U. S.

Additional competition over routes between the U. S. and Latin America was authorized by CAB recently with the issuance of a foreign air carrier permit to Aerovias Brasil (Empresa de Transportes Aerovias Brasil, S. A.).

The carrier will be permitted to operate between Brazil and the co-terminals Miami and New Orleans via Paramaribo, Dutch Guiana; Georgetown, British Guiana; Port of Spain, Trinidad; Caracas, Venezuela; Ciudad Trujillo, Dominican Republic; and Camaguey and Havana, Cuba. It will not carry local traffic between the U. S. and Cuba.

NWA in Sea-Air Pact With Steamship Line

Northwest Airlines and American President Lines have completed arrangements providing maximum sea-air cooperation for the convenience of overseas travelers wishing to use both modes of transportation.

Under terms of the agreement filed with CAB for approval, offices and agents of both NWA and APL throughout the world will sell tickets for either air or surface travel or a combination of both. American President Lines operates mainly in the Pacific but also to other points on the world, while Northwest recently opened its new route to the Orient.

The two companies will accept each other's exchange orders, file joint air and sea fare tariffs with CAB and the Maritime Commission, and adjust commissions to a schedule profitable to both carriers. Round-trip overseas tickets will be offered at a 10 percent discount.

Commenting on the agreement, the Sea-Air Committee, vociferous advocate of a government policy which would permit steamship companies to control airlines, said it was a "gratifying step in the right direction."

New West Coast Link

West Coast Airlines was slated to begin service last week on its northern feeder link from Seattle to Bellingham, Wash., via Everett, Mt. Vernon and Anacortes.

SMORGASBORD

Scandinavian Airlines System is doing what comes naturally on its trans-Atlantic run out of New York. SAS hostesses now serve smorgasbord shortly after takeoff, and passengers can make a complete meal out of the delicacies or merely sample the assortment as an appetizer to the hot luncheon. Sample SAS smorgasbord: herring with sour cream, "Kalassill," Scandinavian caviar, smoked caviar, Scandinavian sardels, shrimp salad, lobster, ecrevisse, "Fagelbo," "gravlax," smoked eel, Westphalian ham, headcheese, liver paste, rolled veal, goat cheese and Old Swedish cheese. Note cabin altimeter for passengers in upper left.

Airport Activity Studied by CAA

New York's LaGuardia Field, Chicago Municipal Airport and Washington National Airport continue to hold top positions in handling scheduled air carrier operations, according to latest CAA statistics covering June, 1947.

Total landings and takeoffs by scheduled airline planes at LaGuardia during June numbered 12,942, against 11,528 in May and 12,300 in May, 1946. Scheduled airline operations at Chicago Municipal Airport aggregated 11,218 in June and at Washington National, 9,809.

Other airports with more than 4,000 landings and departures by scheduled airline planes during June were: Miami 6,701; Los Angeles 6,390; Pittsburgh 6,100; Detroit (Willow Run) 5,927; San Francisco 5,722; Cleveland 5,328; Dallas 5,302; Boston 5,230; Kansas City, Mo., 5,130; Philadelphia 5,060; St. Louis 4,453; Newark 4,073; Atlanta 4,060 and Jacksonville 4,020.

At LaGuardia, Chicago and Washington, scheduled air carrier operations made up the bulk of all landings and departures, but this was not the case at a majority of the 123 airports with traffic control towers operated by CAA. For all points, 1,744,188 operations were listed, of which only 248,817 (or less than 15 percent) were by scheduled air carriers; 175,565 by military aircraft; and 1,319,806 by civil aircraft (private flyers, flight schools, charter operatores, nonscheduled airlines, etc.).

CNRRA Air Transport Pushes Cargo Operations

CNRRA Air Transport, Chinese relief airline, has flown 850,000 freight ton miles during its first five months of operation. Headed by Maj. Gen. C. L. Chennault, former 14th Air Force and Flying Tiger commander, the carrier now uses 17 C-46 and 5 C-47 transports over a nonscheduled network linking the principal ports of Shanghai and Canton with the interior.

Relief supplies constituted 46 percent of the total cargo transported. Commercial goods accounted for 29 percent, mail 15 percent and special government missions 10 percent. Included in the cargo flown were medical supplies, food, vegetable seeds, Chinese currency, textiles, hides, hog bristles, tobacco and silver bullion.

CAT is financed by an UNRRA loan and operates under an agreement with the Chinese government that gives relief supplies top priority and permits use of backhaul and non-priority capacity for commercial cargo. Plan is for CAT to be self-liquidating and pay back the UNRRA loan from operational profits.

Initial operations have indicated large commercial cargo potential in the interior that is currently unable to reach coastal markets because of a lack of transportation.

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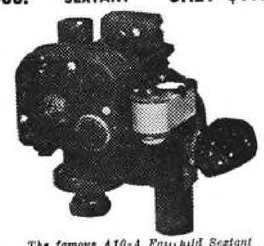

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AVIATION WEEK—September 8, 1947

SEARCHLIGHT SECTION

(Classified Advertising)

EDITORIAL

We Prefer U. S. Airlines

Despite the addition of huge luxury liners like England's two queens to the steamship lanes, trans-Atlantic air services by the three American international carriers continue to improve.

American Overseas and Pan American are starting daily non-stop flights from New York to the British Isles. No foreign company is even approaching this standard. In schedule frequency, operating and maintenance efficiency, crew selection and training, airway aids and communications standards, and bad weather approach and landing systems, U. S. airlines are well ahead of their foreign competitors.

But because the U. S. companies still are plagued by complications in passenger treatment, the foreign carriers are wooing substantial numbers of American passengers.

AVIATION WEEK July 28 observed that foreign operated airlines over the Atlantic are "making up in frills and creature comfort for what they lack in operating efficiency." We also wrote that "the American public doesn't inquire too much about technicalities which are not mentioned in the ads."

These references aroused vigorous protests, naturally, and the truthfulness of the statements on inferior operations was challenged.

It so happens, however, that on Aug. 19 a well known U. S. air transport official, highly respected by the industry for his knowledge of the subject, sent a letter to several other executives, mainly with U. S.-owned international airlines, acknowledging his belief that standards of foreign air transport companies generally are inferior to those of our own international lines.

The letter is so important to the traveling public, as well as to air transport officials who did not see it, that we quote a substantial portion of it:

"Fundamentally, in international operations we are faced with a very serious problem which in my estimation will be more keenly felt competitively by the summer of 1948 but is becoming more and more apparent today. The consensus of opinion leads me to believe that our passenger service aboard aircraft, as well as the handling of passengers at terminals, does not compare with the same service being given by the foreign flag international carriers. This includes ticketing, handling of baggage, service aboard aircraft, including preparation and dispensing of meals and the various other little niceties which we term service. . .

"Regardless of the service delivered by the international foreign carriers, I as an individual would not ride on any of their lines with the probable exception of one on which I would accept passage if necessity dictated. This is based upon my knowledge of the training of pilots, maintenance, and the safety level, but I am not John Q. Public. He sees only the service and, from all outward appearance, the foreign international carriers are flying the same equipment and the outside of the airplane is just as clean and in some instances cleaner than our aircraft.

"Consequently, he tells his friends of the wonderful service and food provided aboard the foreign carriers, in comparison to the poor service and poor food afforded by the U. S. international carriers. This problem is not a fictitious one, nor is it an unrealistic problem, but is a very vital one and we only have to turn the pages of history back to a parallel case of the American passenger shipping industry prior to World War II, in comparison to the ships operated by the French, British, Dutch, Germans, Swedes, and Norwegians. The safety code observed aboard the foreign ships was much inferior to the safety observed aboard the American ships, but regardless of this fact the American public as a whole traveled aboard the foreign ships because they were afforded better service, better food, and better recreational facilities.

"Competition is most evident this year. This is particularly true over the Atlantic but is becoming more evident in the South Atlantic and in the Pacific.

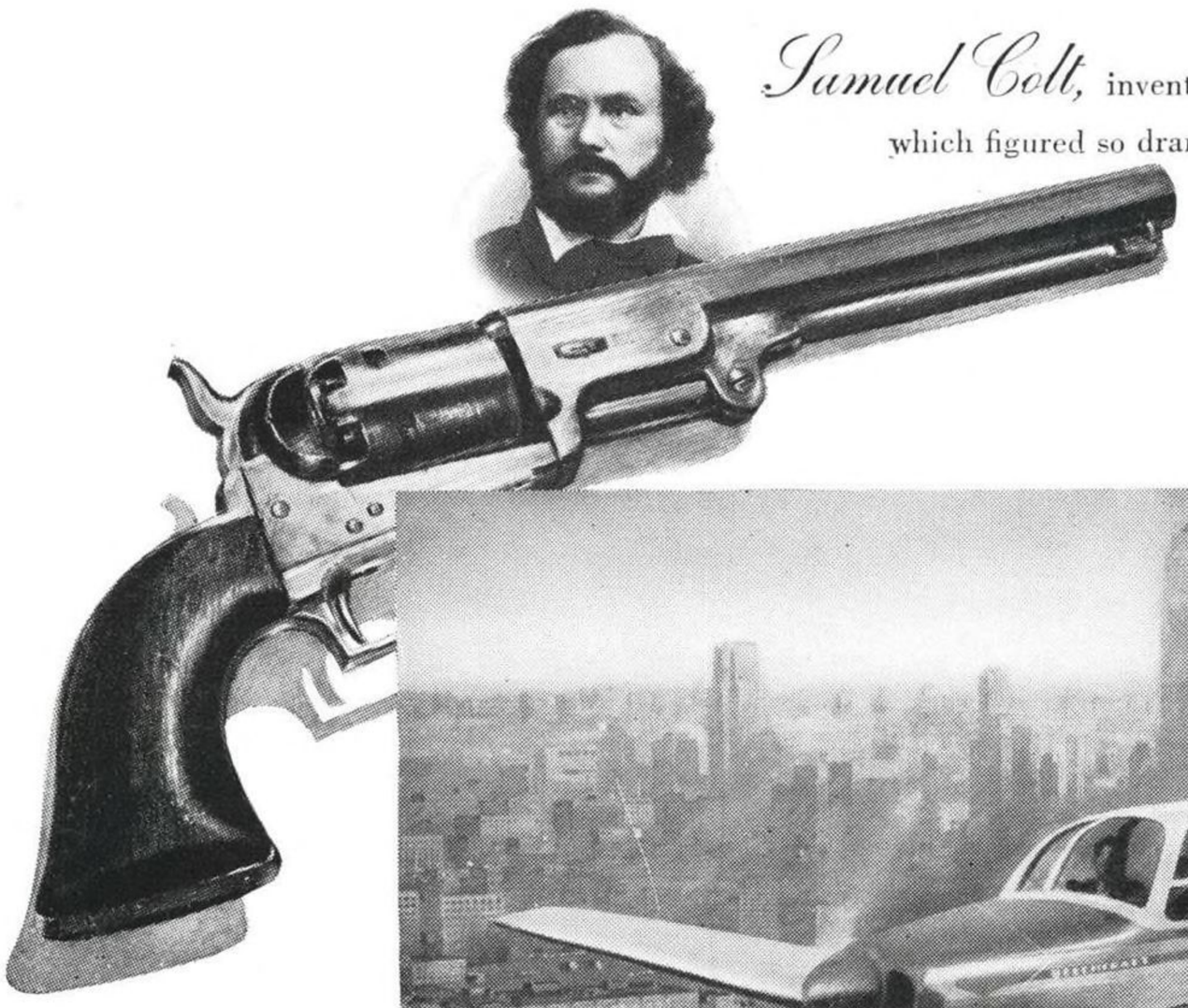
"Once the impression is created that U. S. international carriers afford the public poor service in comparison to the foreign operated international carriers, it is going to be exceedingly difficult to dispel this impression, regardless of advertising. Consequently, it is much easier to attempt to improve the service today in order to hold the market than to lose the market and attempt to regain it."

This is a man speaking from a wealth of experience, not only in the United States. He is primarily interested in arousing fellow air transport executives to the need of re-evaluating personal service to the passenger. Machine-minded Americans are keenly conscious of the need for mechanical and operational perfection, but in the transportation field they have usually under-rated the business value of personal service and comfort.

We have every confidence in the ability of U. S. airlines to continue to excel the foreigners operations-wise, and to match their standards of comfort and service.

As the letter writer points out, however, until our airlines do raise their standard of creature comfort, we shall see hundreds of Americans flocking to foreign owned airliners in preference to our own, which—if these luxury-loving travelers only knew it—are built, operated, and maintained under the highest standards in the world, by the most skilful personnel in the world.

ROBERT H. WOOD



Samuel Colt, inventor of the revolver—the great "equalizer" which figured so dramatically in our conquest of the West

Top Speed, 184 mph; Cruising Speed, 172 mph; Range, 750 miles

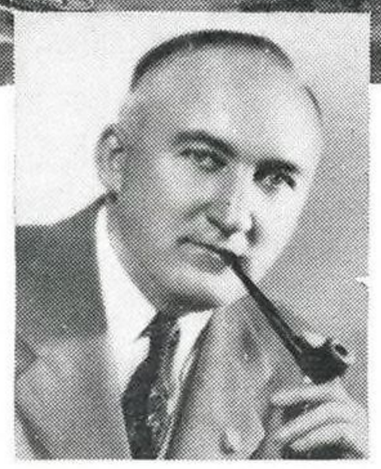
A Great New "Equalizer" for the Business frontier... the BONANZA

ONE INDIAN on a horse could send a dozen arrows at a Texas Ranger before the Ranger could dismount to use his long rifle. But to this unequal duel came Samuel Colt's "equalizer"—the six shooter—which stopped the Rangers' enemies in their tracks.

To today's business frontier comes an equally potent "equalizer"—the Bonanza, an airplane built for business, giving town and city businessman alike new mobility and range.

The four-place Bonanza is a fast airplane, cruising at 172 mph, but does it with the economy of 165 hp at a cost as low as one cent per passenger mile! Add the Bonanza's limousine-like luxury, its quietness, and its easy maneuverability in and out of the smallest fields—and you have air transportation that is tailored to fit the businessman's needs!

The Bonanza comes fully equipped—two-way radio, landing lights, instruments, heater, electric retractable landing gear, flaps, controllable propeller and other refinements. Your Beechcraft distributor will be glad to demonstrate it—and to discuss its adaptability to your transportation needs. We are still filling a large backlog of orders. Additional ones will be filled in sequence.



Walter H. Beech, pioneer in aeronautics, who produced the Beechcraft Bonanza as a modern "equalizer" in business transportation.

Beech Aircraft

CORPORATION WICHITA, KANSAS, U. S. A.