AVIATION WEEK

JULY 7, 1947

INCORPORATING AVIATION AND AVIATION NEWS

A McGRAW-HILL PUBLICATION

SEE PAGE 81

VICKERS HYDRAULIC EQUIPMENT ON

CONVAIR-240

R v. 47' July — Sept. 1947

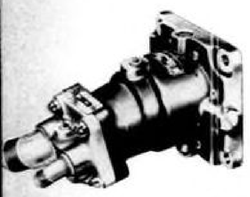
Vickers
Series AA-34500
Unloading Valve.

Vickers
Series AA-12300
Balanced Piston Relief
Valve (2 Port).

Vickers
Series AA-14300
Accumulator.

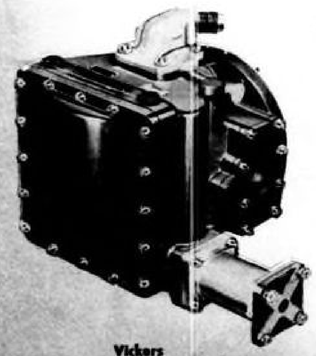
Vickers
Series MF-3906 Constant
Displacement Piston Type
Motor.

Vickers
Series AA-11300
Balanced Piston
Relief Valve
(4 Port).



Vickers Series PF-3911 Constant
Displacement Piston Type Pump.

Vickers Series PF-3915 Constant
Displacement Piston Type Pump.



Vickers
Series AA-33000 Piston Type Pump.
(Accurately controllable — infinitely
variable volume with reversing flow.)

The 3000 psi main hydraulic system and the independent supercharger system for cabin pressurization and air conditioning of the Convair-240 include the Vickers aircraft units illustrated here. Vickers has a complete line of aircraft hydraulic equipment to exactly meet the needs of individual applications. For detailed information, please write us your requirements.

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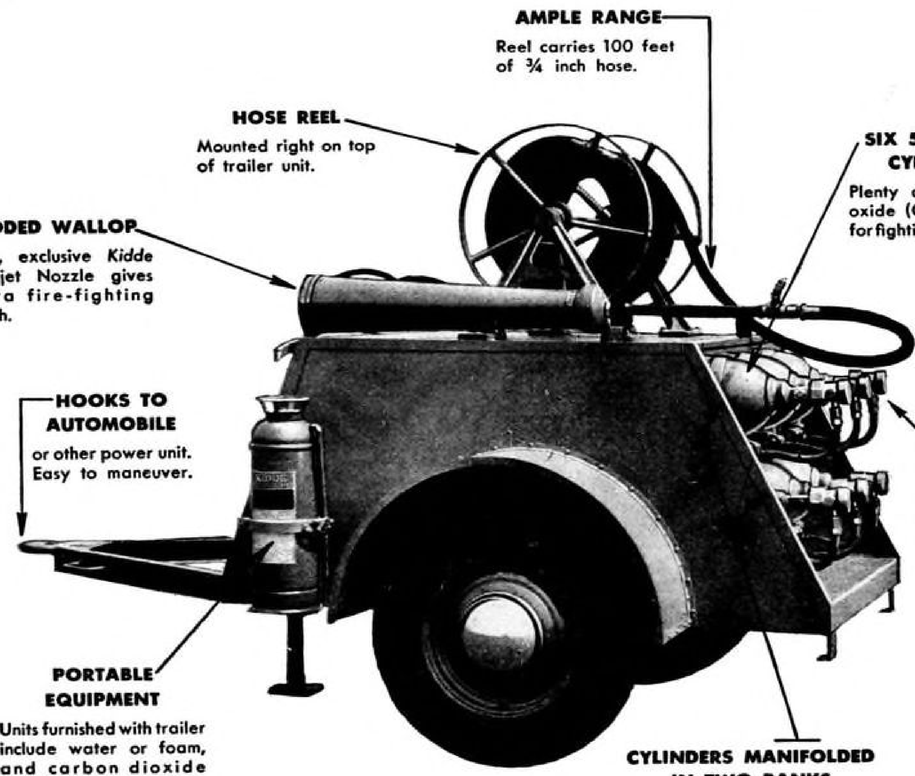
DIVISION OF THE SPERRY CORPORATION
DETROIT 32, MICHIGAN
ENGINEERS AND BUILDERS OF
OIL HYDRAULIC EQUIPMENT
SINCE 1921

Vickers Series [illegible]
Constant Displacement Piston Type Motor.

Vickers Series AA-[illegible]

A NEW, MORE POWERFUL FIRE-FIGHTING TRAILER!



AMPLE RANGE
Reel carries 100 feet of ¾ inch hose.

HOSE REEL
Mounted right on top of trailer unit.

SIX 50-POUND CYLINDERS
Plenty of carbon dioxide (CO_2) capacity for fighting severe fires.

ADDED WALLOP
New, exclusive *Kidde* Multijet Nozzle gives extra fire-fighting punch.

HOOKS TO AUTOMOBILE
or other power unit. Easy to maneuver.

FASTER ACTION
Kidde Vertical Flood Valve provides more rapid discharge of carbon dioxide.

PORTABLE EQUIPMENT
Units furnished with trailer include water or foam, and carbon dioxide portable extinguishers.

CYLINDERS MANIFOLDED IN TWO BANKS
150-pound discharge from each bank. No need to use both banks if one does the job.

THIS new, improved *Kidde* Trailer fits the fire-fighting requirements of both large and small airports. At large fields, it's a convenient supplement to crash trucks and other major equipment. For small fields, it's an economical way to thoroughgoing fire protection!

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AVIATION WEEK

Vol. 47 — No. 1

INCORPORATING AVIATION AND AVIATION NEWS

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THE AVIATION WEEK

SAFETY IN THE AIR—Although newspaper headlines had calmed down somewhat after proclaiming the latest series of air crashes, repercussions continued in the airlines. Big question: Can the carriers survive economic drains occasioned by severe safety regulations?

Speculation on future reports of the President's special investigating board was the top conversation in the industry. In addition to chopping take-off loads, the Board may:

1. Make a third cockpit crewman mandatory, a pilot-navigator, long demanded by pilot union chief Behncke.
2. Raise a hullabaloo over CAA practices and procedures.
3. Amend Part 04 of the CAR. Some previous revisions have not even gone into effect. This may be stage dressing, as DC-3s operate under 04, not the DC-4s which started the present storm.

LANDIS RUNS THE SHOW—CAB Chairman James Landis is running the presidential board. Most informed observers say he named its membership. While a popular quiz game among aircraft manufacturers is why none of their representatives was included, the industry's top policy-makers really are not deeply concerned. According to one version, Landis telephoned a manufacturers' spokesman to invite him to participate but, strangely, was unable to reach him and the matter was not followed up. Aircraft makers are convinced, however, that original design and construction are not involved.

LANDIS-INDUSTRY RIFT—There is growing evidence that the airlines and Landis are getting farther apart every day. Landis is adamant on the safety subject. So is the Air Line Pilots representative. The airlines want safety too, but they point out that in transportation you can make so many safety regulations you will never operate a schedule. The only wreck-proof train, plane or bus is one that never moves. Airline management is deeply concerned over the economic aspects of over-stringent regulations which may be imposed by the Truman Board.

PERSONAL PLANE SHAKEUP—Next to airline safety, biggest conversation piece was Ryan's purchase of the Navion and Texas Engineering's acquisition of the Globe Swift and Johnson Rocket.

Because of the depressed personal plane market, there have been no optimistic evaluations of these moves. Both purchases have intriguing angles. Resuscitation of the Navion puts one of the lightplane's earliest practitioners back into the business. Although he has been away for a long time, Ryan is not a greenhorn.

First act of Temco after buying the Swift was to announce a big price cut. Main interest in this attaches to the fact that while everyone agrees personal planes are too expensive, few manufacturers have admitted, or will admit, that they can cut prices.

Don't forget that the Swift, with a 125hp engine and a retractable landing gear, now drops plump into the same general price class as the other all-metal ships on the market—Luscombe, Cessna and Ercoupe—two-placers with 85hp. Temco has a good production record. It has written off all development and tooling costs and took over a sizable inventory of completed planes. Meanwhile, Luscombe cut production; Piper deferred action on a preferred dividend.

The personal aircraft industry is in a revolution. Result will be fewer manufacturers, lower prices, and improved models to keep up with the competition.

MILITARY AIRCRAFT AND THE HILL—While sharing the general interest in the safety investigation, military aircraft manufacturers were keeping an eye on Capitol Hill last week. With the shape of this fiscal year's military and Naval appropriations now known, the industry can figure out—tentatively—about where they stand.

It's an uncomfortable spot. With money already obligated, plus fiscal '48 funds, the next 12 months should be no worse than the last. They should be a little better. But after that the outlook is dark.

Heavy aircraft makers are watching most carefully the national air policy legislation moving in the Senate. If this can be enacted in the waning days of this legislative session, it may exert a powerful influence on future appropriations. If an air policy bill fails to get by the "back-home" rush, some manufacturing people feel the last opportunity has passed.

WASHINGTON OBSERVERS PREDICT:

► The new world's speed record of 623.8mph may be broken in a few weeks by the same Lockheed P-80R that set the new mark. Pilot Albert Boyd found no compressibility trouble, and did not use full power from the Allison-built J-33 engine. Florida is being discussed as scene of the next attempt.

► Despite the flat statement of the British Minister of Civil Aviation that Britain would not buy more U. S. transports except those already on order, British Overseas Airways are likely to receive more Constellations.

► Export-Import Bank shortly will announce another manufacturer's participation loan for foreign purchase of U. S. transports.

► Unification of the armed services is almost certainty. Cutting off hearings in the House Armed Services Committee was the tip-off, according to merger proponents.

► Although CAA is getting its cumbersome airport aid machinery moving, insiders are convinced the regulations will still keep the pace to a crawl.

NEWS DIGEST

DOMESTIC

William A. M. Burden's resignation as Assistant Secretary of Commerce for air has been accepted by President Truman as of June 30. Pending appointment of a successor, Burden's duties will be divided between CAA administrator T. P. Wright and William C. Foster, Under Secretary of Commerce.

Western Air Lines will inaugurate its AM 63 route extension between San Francisco, Portland and Seattle around July 15.

Maj. Alexander P. de Seversky was awarded the Harmon International Trophy for his wartime contributions to the development of long range escort fighters and strategic bombardment theory.

Continental Air Lines has appointed Allen P. Shelley as director of engineering and maintenance to replace Stanley R. Shatto, who resigned effective July 15. Ronald C. Kinsey, who recently resigned as vice-president of Western Air Lines, has been named vice-president of Continental with offices in Washington.

House Armed Services Committee approved legislation authorizing a $254,696,000 Naval public works program including $34,000,000 for development of the Pt. Mugu, Cal., guided missile test range.

President Truman requested a supplemental appropriation of $1,336,000 to cover payment on an unanticipated volume of airmail carried during the last few months of the 1947 fiscal year.

Chan Gurney (R., S. D.) introduced legislation authorizing a War Department public works program estimated at $225,000,000 for the 1948 fiscal year. It includes numerous additional AAF facilities.

William Van Dusen, former public relations director of Pan American Airways has organized his own firm to specialize in industrial and advertising counselling. Offices will be at 250 Park Ave., New York City, and in Washington.

FINANCIAL

TWA broke into the black for the first time this year during May with a profit of about $100,000, according to President LaMotte T. Cohu.

Mid-Continent Airlines reported net profit of $6,512 and a 64.7 percent load factor in May against $38,453 profit and a 76.1 percent load factor for the same month last year.

Consolidated Vultee Aircraft Corp. reported a net loss of $769,287 for the six month period ending May 31, after an estimated credit of $1,708,206 resulting from tax carry back provisions.

Boeing Aircraft Co. announced a $10 a month salary increase for 3,000 non-union office and supervisory employees effective July 1.

Martin Memo

Published by The Glenn L. Martin Company
Baltimore 3, Maryland

On Leading Airlines Soon . . . Here, the ultramodern Martin 2-0-2 airliner is shown in flight during CAA certification tests. Speedy Martin luxury liners will soon be a familiar sight at airports the world over when they go into operation for these great airlines and cargo carriers: Capital (PCA) . . . Eastern . . . Chicago & Southern . . . United . . . Northwest . . . Delta . . . Panagra . . . Cruzeiro do Sul (Brazil) . . . Aeroposta (Argentina) . . . Nacional (Chile) . . . Mutual . . . Flying Tiger . . . Air Borne Cargo . . . U. S. . . . Willis.

Going Up . . . 235 Miles . . . Rocketry is one of the more advanced research projects of the Martin Company. Now under construction is the Neptune, first of ten experimental rockets, 45 feet long, capable of flights to 235 miles above the earth's surface. These huge rockets, being built by Martin for the Navy, are the first all-American long-range missiles of supersonic speeds.

As a Military Transport . . . The Martin 2-0-2 offers many advantages. It cruises 100 m.p.h. faster than prewar twin-engine transports. It can carry 50 completely equipped troops or 15,000 pounds of cargo. Built-in features include new thermal anti-icing equipment . . . efficient van Zelm ailerons . . . tricycle landing gear . . . large cargo doors for easy loading and unloading.

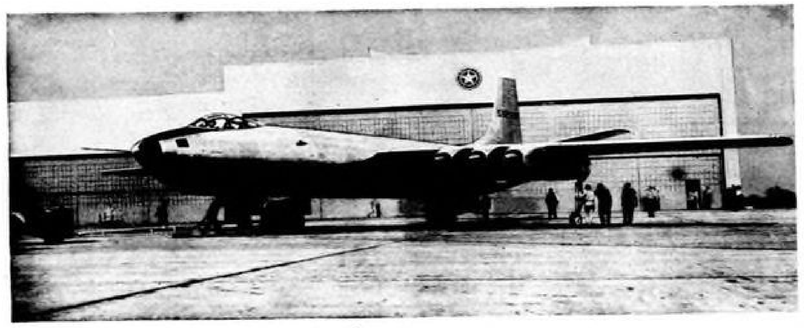
25,000 Flying Hours . . . During static tests, the Martin 2-0-2 was subjected to wrenching and straining equivalent to 25,000 hours of flying or 10 years of average service. Results of these rigorous tests are further proof of the superiority of the Martin 2-0-2's advanced design and construction.

Increased Profits for Airlines . . . The new twin-engine Martin 2-0-2 carries 36 to 40 passengers (or 15,000 pounds of airfreight in the cargo version) at speeds 100 m.p.h. faster than the planes they supplant. But more important is the fact that this modern transport needs only 19 passengers (by ATA formula) to break even. Thus, airline profits with the Martin 2-0-2 can be as high as 50% of the total passenger payload. That's one of the big reasons 15 leading airlines have ordered Martin transports.

Looking for Cold Weather . . . To thoroughly test a new thermal anti-icing system, now standard equipment on all Martin transports, a Martin 2-0-2 was sent to Minnesota. Flying in the cold layers of air north of Minneapolis, the engineers and CAA representatives were able to choose varying types of icing conditions for their experiments. The system which involves passing heated air through the wing and tail assembly proved successful . . . the experiments were acclaimed by aviation experts as a big step forward in all-weather flying.

"A Real Buy" Here's Why . . . Martin has orders for more new transports than any other manufacturer. Through quantity production Martin is able to spread the cost of Martin transports over a larger number of planes, giving purchasers these great new airliners at low cost.

Low-Cost Maintenance . . . These are not windows in the Martin 2-0-2. They are a few of the numerous accessory compartment openings which provide easy access to the 2-0-2's electrical and hydraulic systems. These built-in timesavers mean low maintenance and servicing costs. The openings shown above are in the bottom of the fuselage.



Newest Jet Bomber . . . The high-speed, long-range XB-48 was built by Martin for the Army Air Forces. Powered by six jet engines, it is the largest multi-jet conventional type plane yet constructed. The XB-48 also pioneers a new bicycle type landing gear developed by Martin for high-speed aircraft.

Martin
AIRCRAFT
Builders of Dependable Aircraft Since 1909

AVIATION WEEK
INCORPORATING AVIATION AND AVIATION NEWS

Air Safety Board Urges Cuts In Airline Maximum Weights

Sees inadequate safety margin in present requirements; revision of Civil Air Regulations will offset air carrier revenues.

The special Presidential Air Safety Inquiry Board was probing into the controversial fog surrounding the merits of landing aids last week after dealing a stiff blow to airline payloads in its initial recommendations to the president. CAB Chairman James M. Landis, who also heads the special board, indicated at a press conference that these recommendations would be implemented by CAB directives on the subject.

First board report indicated dissatisfaction with present margins of take-off safety and urged added operational weight restrictions that would cut air carrier payloads materially in many cases and ultimately result in sizeable revenue reductions.

Changes recommended in maximum take-off weight formula computations include:

- **Eliminating 300 ft. of runway** in calculating allowable gross weights for accelerate and stop distances to provide more time for pilots to decide whether to decide to stop or continue take-off after reaching the critical speed. Landis indicated that this change would knock from 3,000 to 4,000 lb. from gross weights.
- **Eliminating wind factor** on 4,000 ft. runways that now allows higher gross loads on take-off with increased wind velocity.
- **Adding temperature factor** to subtract 500 lb. from gross load for every 10 deg. rise over standard temperature with a similar increase for every 10 deg. under standard temperature. The board indicated it was aware that this factor did not make full allowance for the addition of weight with increase of temperature but felt that combined with other measures would provide sufficient safety margin. Landis said it was estimated that each additional degree of temperature over 59 deg. F. added 250 lb. to the weight of a DC-4. This would reduce payloads substantially, during the peak traffic loads of the summer season when airlines count heavily on large profits to tide them over the winter slump.
- **Revising Civil Air Regulations** to make mandatory inclusion of all runway gradient factors in take-off weight computations. CAR now permits gradients to be ignored unless they are "appreciable," it was noted.
- **Banning Landing** of four-engine transports on runways less than 4,000 ft. long without a minimum wind of 25 mph blowing within a quadrant of 45 degrees on either side of the plane's nose. The board considered closing all runways of less than 4,000 ft. length to four engine operations (estimated to be 15 percent of all runways now authorized for such use) but decided the additional hazards of that action would outweigh any safety achieved.

Other recommendations included provision of better wind information to pilots; requiring lighted windsocks at all commercial airports, standardized cockpit check lists on four eigine aircraft of the same type; early completion of a U. S. Coast and Geodetic Survey project to make accurate obstacle and terrain maps of major airports and redesign of the gust lock on DC-4.

► **New Gust Lock**—This last recommendation is already being implemented by the Douglas Aircraft Co. It has not yet been determined whether the gust-lock was on or off when a United Airlines DC-4 crashed off the end of a 3,533 ft. runway at LaGuardia Field last month.

All of the initial recommendations were based on a study of the LaGuardia crash which revealed that CAA had not checked airline maximum take-off weight computation formula as required by the Civil Air Regulations and that a difference in interpretation of CAR between CAB and United Air Lines, unchecked by CAA, resulted in a 3,000 lb. overload on the fatal crash. Landis pointed out that it has not yet been determined whether the overload was a primary cause of the accident.

► **Pilots Triumph**—The Board's recommendations represented a triumph of the Airlines Pilots Association over airline management represented by the Air Transport Association. ALPA fought addition of the wind factor in increasing take-off gross weights when it was introduced in 1941 and has long campaigned for a temperature factor as recommended by the board. To soothe airline protests over the new weight formula the board will hold a public hearing on the changes at which all interested parties may state their case. Both the Air Line Pilots' and ATA representatives have been supported by their own technical experts in the closed board sessions.

Meanwhile three other crash investigations continued to tax CAB Safety Bureau investigators. Hearings opened on the crash of a Capital Airlines (PCA) DC-4 near Leesburg, Va. that killed 50, and special investigators continued probe of a Pan American Constellation crash in Syria fatal to 15 of 36 aboard. Industry attention was centered on the Syrian accident since it was caused by at least one and possibly two engine fires on a Model 49 with fuel injection engine that had been approved for operation by CAB after a series of engine fires resulting in grounding of all Constellations last summer. Preliminary investigation of the Eastern Air Lines DC-4 accident near Bainbridge, Md., has been completed and a final report is in preparation.

CAA, which has been under heavy criticism during closed Board sessions for failure to adequately enforce CAR, revealed it has collected $19,500 in fines from airlines during the past year for safety volations. The CAA record showed 11 separate fines ranging from $100 to $9,500. Panagra paid the largest fine as a consolidated penalty for failure to maintain firefighting equipment; dispatching a plane when pilots did not have proper maps, and failure to maintain adequate maintenance record. United paid $5,000 for making a short cut off the airways on the Kemmerer-Rock Springs, Wyo. route.

DC-6 SHOWING

United Air Lines, which lost over $3,450,000 in the first quarter of 1947, will be in the black during the second quarter, according to President W. A. Patterson. Reporting that his company had 12 DC-6s in operation during the first week in June, Patterson said the planes will be an important factor in the better financial showing. UAL expects to receive eight DC-6s a month until 35 are on hand. The carrier's new DC-6 run to Hawaii is operating close to capacity, and on July 1 Washington-San Francisco DC-6 flights with one stop at Chicago will be inaugurated.

Senate Group Asks State Airport Channel

Urges legislation making funneling of Federal aid through local governments mandatory.

The issue of whether federal airport funds should be allocated to cities, or exclusively to states, was revived in Congress last week when the Senate Interstate and Foreign Commerce Committee reported out legislation making mandatory the funneling of federal aid through state governments.

During Congressional consideration of the 1946 Airport Development Act, the Senate voted such a stipulation. The House approved a provision giving the CAA Administrator discretion to allocate federal airport funds to states, cities, or other local political subdivisions. A year's Senate-House deadlock was broken by adoption of a compromise provision permitting federal allocations to cities—unless prohibited by state law.

► **State Laws**—Twenty-two states have enacted legislation prohibiting the federal-city relationship: Connecticut, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Jersey, New York, North Dakota, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, West Virginia, Wyoming.

Economy, the desirability of restoring the federal-state pattern in public works development, and the inability of cities to finance airports, the Senate Interstate and Foreign Commerce Committee declared, demand legislation precluding the federal-city relationship in the remaining 26 states. The committee pointed to economies which may be effected in CAA's administrative budget when the agency is required to deal with 48 states, instead of some 100,000 state, municipal and other local governments.

► **Supporters Listed**—Supporting the legislation placing the airport program on a federal-state basis at committee hearings were representatives of the U. S. Chamber of Commerce, the Council of State Governments, and the Governors' Conference. The American Municipal Association, the National Institute of Municipal Law Officers, and the U. S. Conference of Mayors opposed the measure, introduced by Sen. Owen Brewster (R., Me.).

In addition to preventing cities from direct dealing with CAA on airport projects, the Brewster Bill makes these non-controversial amendments to the 1946 Airport Act, most of which were recommended by CAA:

• Instead of specifying Class IV and V airports for Congressional approval, all airports accommodating commercial aircraft—even if they do not meet CAA's technical requirements for IV and V classification—are designated for congressional approval before federal funds can be allocated for their construction. The change means that several Class III airports, accommodating transport aircraft, will be limited to not more than 50 percent federal financing, with the amount of federal aid discretionary with the CAA Administrator. At present, CAA is required to finance 50 percent of the cost of Class I, II, and III airports, but the Administrator is given discretion as to the amount of federal aid, up to 50 percent of the total cost, to be allocated to Class IV and V airports.

• The Airport Act's sponsor financing requirements are eased. At present, CAA must obtain a sponsor's share of the cost of a project before approving it and committing federal funds to its development. Under the proposed revision, the CAA Administrator would be permitted to approve projects as soon as he is satisfied that sponsors' funds will be available as needed.

• Federal lands are made available for non-federal-aid airport projects. At present, federal land may be used only in connection with federal-aid projects.

• The amount of free-space to be allocated CAA for air traffic control is specified. CAA is to be given such space only at the particular airport federal funds helped finance. Under the Airport Act, CAA, by financing a single airport project in a state could demand free air traffic control space at an indefinite number of locations.

• The requirement for CAB certification that a proposed airport project is necessary for air commerce or in the interest of national defense is removed.

EMERGENCY FUEL RELEASE

Heretofore unpublished, this test flight photo of the Truculent Turtle shows plane's specially-designed giant fuel dump chute in operation. It is a 10-in. aluminum pipe carried on rollers within the fuselage. Extended, it is coupled to a three-way valve leading to nose, bomb bay, and aft fuselage tanks. The Turtle could dump 800 gal. in the first 20 seconds; 5,200 gal in six minutes.

Airport Disposal Bill Rewritten in Senate

Congressional efforts to speed disposal of surplus airports took a new form with the reporting to the floor of the Senate a greatly rewritten version of the bill introduced last winter by Senators Brien McMahon and Raymond Baldwin, Democrat and Republican, respectively, of Connecticut.

While the original bill had as one of its main purposes establishment of what in effect would have been a separate set of rules for disposal of airports, the draft coming from the Senate Armed Service Committee makes the measure an amendment to the Surplus Property Act and keeps all the authority granted by the amendment within the framework of that law.

► **Nearby Property at Stake**—Chiefly at stake in the writing of the original bill, and the Committee draft, is industrial property adjacent to airports. Purpose of the legislation is to enable War Assets Administration to lump such property with the airport in turning it over to a state or city, with assurance that the government will collect if the agency acquiring the airport later rents the industrial property to a manufacturer.

Under the McMahon-Baldwin bill, there was considerable doubt whether WAA would have any claim to the rental in event of such a transaction. Another aspect of the original bill, cleared up in the Committee proposal, is that it would have made CAA the final authority in determining the disposition of airport property. In the revised version, CAA has power to recommend, with WAA having the last word.

New Price Tags Set For Temco Swifts

New price tags for the two-place all-metal 125 hp. Swift personal plane are set at $3,750 for the de luxe model and $3,250 for the standard model, Robert McCulloch, President of Texas Engineering and Manufacturing Co., Dallas, has announced.

Temco will immediately resume production and delivery schedules on the Swift, as a result of purchase of manufacturing rights from the bankrupt Globe Aircraft Corp., recently, for $328,000.

► **$1,000 Cut**—The new price is more than $1,000 below the former Globe list price for the airplane and is expected to enable the Swift to compete successfully in the highly competitive two-place field. As the only 125 hp. allmetal two-place plane with retractable landing gear, and with a 140 mph. cruising speed, in the American market, the Swift at its new price offers serious competition to other two-placers with 85 hp. or less, with fixed landing gear, which are selling in the same general price range.

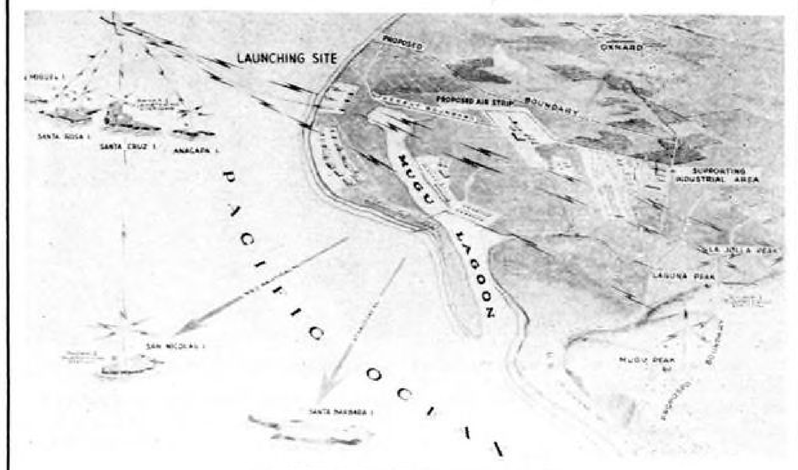
Movement of tools, raw materials, supplies and sub-assemblies from the Globe plant to the former North American Aviation war plant at Grand Prairie, Texas, leased by Temco, is already in progress, following approval of the sale of most Globe assets to Temco, approved by the U. S. referee in bankruptcy.

Temco manufactured approximately 330 Swifts for Globe at the Grand Prairie plant, under sub-contract, and maintained the Grand Prairie Swift production line intact after cancellation of the sub-contract, forced by bankruptcy of Globe. This will make possible immediate resumption of production, and the company is prepared to make immediate deliveries on either model of the 125 hp. airplane.

Company announcement did not refer to the 85 hp. Swift, the first model of the plane to be built, which apparently has been abandoned in favor of the higher horsepower plane.

► **Firm Enthusiastic**—"We believe it is the finest plane in the two-place field, since it combines performance with exceptional utility," McCulloch, and H. L. Howard, Executive Vice-President, said in the announcement. "It already has gained international recognition as an excellent cross-country performer which benefits business man and sportsman alike. We wish to assure all Swift dealers, customers and prospective customers that the Swift is in the personal aircraft field to stay. Temco is placing its full resources behind the continued production of the Swift and is now ready to undertake the servicing of these airplanes to any extent necessary."

Temco was organized late in 1945.



NAVY MISSILE CENTER

Sketch of Navy's experimental guided missile test station at Ft. Mugu, north of Los Angeles, showing planned installation of radar tracking and telemetering equipment for long range guided missile tests. Fate of the center will be decided in naval appropriation bills currently before Congress.

Reynolds Plans New Round-World Flight

Another 'round-the-world flight, following a 30,000-mi. route crossing both North and South Poles, will be started about Aug. 1, according to Milton Reynolds, present holder of the world-girdling record. Expected to be used is a converted Convair B-24 bomber, in command of Bill Odom, who piloted the Douglas A-26 Reynolds Bombshell on its record-breaking hop.

Scientific data are to be obtained by ten technical experts expected to comprise crew and passengers on the new flight. Data will be made available to the government and civilian scientific agencies, who will loan equipment for the journey. Radar will be carried, particularly for use over the South Polar regions.

Lysdale Heads Group

Jack Lysdale, Minneapolis, was elected president of Minnesota Aviation Trades Association at the recent Minneapolis meeting, held to discuss aviation insurance and flight school problems. Other officers chosen: Ed Croft, Rochester, vice-president; Lyle S. McKown, Minneapolis, secretary-treasurer; George Hawkins, Marshall, newly elected to board of directors; Clarence W. Hinck, Minneapolis, and Croft were re-elected to the board.

Dutch Lines Merge

Merger of KNILM (Royal Netherlands Indies Airlines) with KLM (Royal Dutch Airlines) has been announced by Albert Plesman, KLM president.

Wiggins Airways Suspends Investments

The lone feeder system certificated for the New England area by CAB more than a year ago is inherently uneconomical and cannot be activated without excessive mail payments unless substantial changes are made in the route structure, Wiggins Airways has informed the Board.

Wiggins said it had incurred $115,000 in pre-operational expenses by the middle of February, 1947, and that in view of its inability to obtain public or private financing for the feeder system as presently set up it had suspended further investments in the carrier. The Norwood, Mass., company declared that AM 79, extending between Boston and Albany, was a marginal route when certificated in June, 1946, and indicated that Board action last March suspending operations on one of the segments because of inadequate airports made the system sub-marginal. Wiggins asked the Board for immediate hearing on its request to extend AM 79 to New York City and other points and on its plea to prolong the life of the certificate. Without amendment, the three-year temporary franchise expires December, 1949.

Competition Sought

Hawaii legislature has asked CAB to hold immediate hearings on certification of a second Inter-Island passenger service to compete with Hawaiian Airlines. At the same time, $532,000 was appropriated for airport construction, bringing the territorial fund to about $1,750,000, including Federal aid.

Tennessee Operators Use New Ground School Plan

Tennessee Flight Operators Association has developed a new type of ground school operation for the GI flight training programs designed to cut ground school time in half and iron out problems which have been confronting flight operators throughout the country. Flight operators in Tennessee are drawing up their new yearly contracts.

Approved by Veterans Administration and the Tennessee State Department of Education, the system is a home-study course with a text called "Graphic Flight." Graphic Flight is a series of seven books covering the ground school subjects in a new illustrative manner. Meteorology has been redesignated "Moving Weather," a text supplemented by a three-dimensional device which moves across the map.

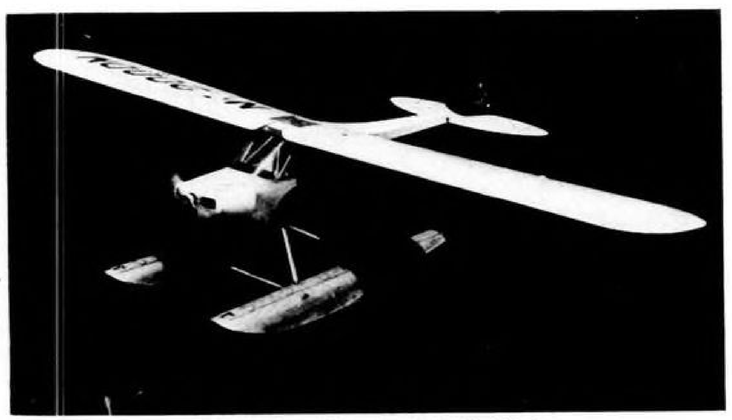
Under the old ground school program the course for private license required from 30-35 classroom hours; under the new, from 9-15 hours. A commercial license required from 105-110 classroom hours under the old system; under the new, from 25-44. This system may be worked in a flexible manner in order to allow CAA-approved schools to operate the home study course without losing their rating.

Buford Ledbetter, president of the Tennessee Flight Operators Association, developed the home study course and wrote the Graphic Flight series. The rate of 70 cents per student hour in many cases was insufficient for operators to secure competent instructors and necessary teaching facilities, and many students were enrolled in the commercial ground school though all they actually desired was a private license.

HELICOPTER WHIRL TEST TOWER—First photo of new 40 ft. NACA helicopter test tower at Langley Field, Va. shows three-blade Sikorsky R-6 rotor mounted on the tower for preliminary calibration tests of the tower. Motor-driven shaft will turn rotors as large as 60 ft. diameter. Tip speed problems, aerodynamics, flutter and vibration will be analyzed with the use of this new research facility. (Details on Page 21)

Plane-to-Ground Service

Plane-to-ground radio telegraph service for trans-Atlantic passengers will be started as soon as CAA approval is obtained, American Overseas Airlines said. The line has obtained an FCC license to transmit public messages from in-flight planes to the ground. It said it was the first airline to apply for such a license. The new service will be provided over the North Atlantic at rates available to steamship passengers for ship-to-shore telegraph. Messages can be sent en route.



CUB SPECIAL FLOATPLANE

CAA approval has just been obtained on floatplane version of new 65-hp. Piper Cub Special PA-11 equipped with Edo Model 1400 all-metal floats. Performance of two-place tandem floatplane, with McCauley metal propeller includes a 360-fpm. rate of climb, 92-mph. top speed and 80-mph. cruising speed. Tests showed plane airborne in a 40 sec. water run, with 1350 lb. gross weight. Floats are of new simplified Edo design with retractable water rudder, padded bow bumpers, and other features for simplified field maintenance.

Airfreight Forwarders Form Permanent Group

The Airfreight Forwarder Association, created as a temporary organization last winter (AVIATION NEWS, Feb. 24), has been established on a permanent basis and has moved to strengthen its ties with uncertificated all-cargo airlines.

Meeting in Washington recently, AFA named a new slate of officers and appointed an executive committee to ask CAB for immediate issuance of temporary authority permitting selected independent airfreight forwarders (not connected with surface interests) to operate as indirect common carriers. AFA contends that CAB can determine which companies are qualified for the temporary authority from the record of the Board's current airfreight forwarder hearing.

Representatives of four members of the Independent Airfreight Association—Slick Airways, U. S. Airlines, California Eastern Airways and the Flying Tiger Line—met with the forwarders and assured them of their support. New AFA officers: Allen Dean, National Airfreight Forwarders, Detroit, president; A. N. Wiley, Air Express International, New York, first vice president; W. L. Thompson, Mercury Airfreight Corp., Los Angeles, second vice president; F. V. Gandola, Airborne Coordinators, Cleveland, secretary; and P. A. Bernacki, Peter A. Bernacki Co., Philadelphia, treasurer.

British Planning New Trunk Services to Orient

(McGraw-Hill World News)

Melbourne—British experts are in Australia exchanging technical data with officials of the Commonwealth Department of Civil Aviation in a survey of trunk air route services between the U. K. and Japan and Australia.

The British Government hopes soon to extend its flying boat service past Hong Kong to Tokyo, and BOAC intends to start a new "South China Sea Circular Route" this year from Hong Kong to Manila, Borneo or Sarawak, Singapore, Bangkok, Hanoi and back to Hong Kong.

G. Warcup, head of the Overseas Airfield branch of the British Ministry of Civil Aviation said the Bristol Brabazon I probably will be reserved for the North Atlantic run with Tudor IIs used on the Australian route.

Autogiro Patents

Under a new licensing arrangement with the Autogiro Co. of America, United Aircraft Corp. acquires rights to use more than 200 Autogiro-held patents in general production of its Sikorsky helicopters. The wartime licensing agreement between the two companies covered only government procurement.

AAF Is Pondering New Bomber Rules

New heavy, long-range equipment calls for strategy re-evaluation.

Recent completion of the first production B-36 at the Consolidated Vultee Ft. Worth plant, and the fact that 99 sister ships are coming off the line at a planned rate of one a week, is being accompanied by a complete AAF re-evaluation of the bombing strategy which proved so successful in World War II, but which this very heavy, very long range bomber makes obsolete when it goes into service.

On short range missions the six-engine B-36 can carry 72,000 lbs. of bombs, but still more important, it can carry 10,000 lbs. of bombs, or an atomic bomb for a strike 4,000 miles from home, with enough gas for a trip home.

Commanding Gen. Roger Ramey of the Eighth Air Force, which will be the first force to be equipped with a B-36s, points out that the U. S. is already equipped with a few atomic bomb groups, and that with B-36s to carry the atom bombs, a retaliatory strike against an aggressive act will be made possible that would be "terrible to contemplate."

General Ramey forecasts the following trends in bombing strategy with the advent of the B-36 to service:

► **Need for advanced bases** with huge amounts of waterborne supplies, and island hopping advances using carrier forces with short range planes in enemy waters largely will be eliminated, since the long-range bombers can strike from the North American continent, anywhere in "that part of the world where aggression against us could start."

► **The new bombers** will have enough range to make attacks by indirect approach, widely skirting expected zones of approach so that any aggressor nation expecting B-36 retaliation would have to maintain a warning net around its entire boundary, an almost impossible task.

► **With present power,** B-36 top speed is quoted at over 300 mph. at 30,000 ft. and it is estimated that use of turbo-jet engines in the B-36 would raise this speed to around 400 mph., near critical compressibility for its structure. Successful fighter attackers would have to have 25 percent more speed, which would put them up in the critical compressibility regions. Until new fighter tactics are evolved, the faster bombers will be safer from fighters than were the World War II bombers.

► **Defensive armament** of the B-36 will include eight turrets each with two 20 mm. cannon plus high-speed "parasite" fighters carried by the bombers. (McDonnell Aircraft's XP-85, previously described and sketched in AVIATION NEWS. These tiny jet fighters will be dropped by the big planes in the event of attack, and are designed to be picked up again by the mother planes at the end of combat. The parasites are needed because the very long range of the B-36 precluded the use of escort fighters.)

► **The AAF is not discounting** the role of guided missiles and proximity fuses in the next war. Radar counter measures against such weapons must be considered. But General Ramey does not consider that the B-36 has been obsoleted by "push-button warfare." Until further development of push-button warfare, he expects the B-36, the B-50, and other aircraft now getting into the air will comprise the principal U. S. striking force.

► **There is no place** in the world that can't be bombed by the B-36 if shuttle bombing technique is used.

► **Value of the B-36** and other new bombers depends on their availability in quantity when any nation first attacks us.

NEWEST CORSAIR

First photo of Vought F4U-5 Corsair, now in production for Navy. Only outward appearance change from predecessor F4U-4 is two air intake grills on lower leading edge of cowl, replacing single one at bottom of earlier models. Extensive changes have been made within fuselage, including completely new cockpit interior. Powered by new P & W R-2800-E engine turning new Hamilton Standard prop, craft is called "fastest, most powerful propeller-driven single engine fighter in world."

Nearly 1/3 U. S. Planes Surplus Sold by WAA

Nearly one-third of all planes registered in the U. S. are surplus aircraft disposed of by War Assets Administration, which in a little more than two years has practically sold out of airplanes. Of approximately 65,000 planes turned over to WAA, about 35,000 have been sold for civilian use, with the balance sold for scrap.

Reported acquisition cost of the $65,000 planes was more than $5,000,000,000. On planes sold for civilian use, return to the Government was about 8 percent. The 30,000 planes sold for scrap yielded an average of 1½ cents a pound.

Planes sold civilian use by WAA: liaison, 3,775; utility cargo, 900; light transports, 2,900; medium transports, 1,300; heavy transports, 450; primary trainers, 11,915; basic trainers, 8,670; advanced trainers, 4,775. WAA's surplus plane stock now consists of about 625 C-46's, plus 200 DC-3's and DC-4's on lease to airlines.

Airport Aid Offers Made to Nine Cities

CAA's Federal-aid airport program, after getting off to a slow start with the first grant-in-aid offered to Twin Falls, Idaho, a year after passage of the act, by last week had offers of grants-in-aid out to nine cities, and was ready to go with a batch more.

Largest offer yet is to Chicago, $879,000 for the Class I downtown airpark on Northerly Island. The city will put up an equal amount. CAA stated the high cost for such a small field is due to the filling, and erection of bulkheads necessary to construct the field.

Other projects on which CAA has offered grants-in-aid:

- **Butler, Ga.**—Federal, $1,250, sponsor, $3,750; acquire land; Class II.
- **Camilla, Ga.**—Federal, $18,500, sponsor, $24,700; acquire land, construct Class II field.
- **Plainview, Tex.**—Federal, $75,000, sponsor, $75,000; pave runway, taxiway, aprons, construct administration building; Class II.
- **Green Bay, Wisc.**—Federal, $522,000, sponsor, $475,000; construct Class III field.
- **Harrisburg, Pa.**—Federal, $225,063, sponsor, $300,000; expand administration building, and other work; Class III field.
- **Bastrop, La.**—Federal, $76,765, sponsor, $72,538; acquire land, construct Class I field with two strips.
- **Anadarko, Okla.**—Federal, $18,088, sponsor, $52,140; acquire land, improve Class I field to Class II.

Industry Personnel Changes Reported

Continental Motors Corp. elected Thura Engstrom vice-president and factory manager of the Muskegon Division. He steps up from acting factory manager, after a 27-year career with Continental.

In other personnel actions:

► **Stewart-Warner Corp.** announced resignation of Lynn A. Williams, Jr., as vice-president in charge of the South Wind Division, manufacturer of aircraft heating systems. E. A. Hiter, senior vice-president, takes over supervision of the Division in addition to his other duties.

► **Republic Aviation Corp.** named Dickson Mullin Seabee factory representative for the West Coast. His aviation background includes affiliation with Beech Aircraft as service test pilot and with Taylorcraft as factory representative. He served as a Navy fighter pilot during the war.

► **Curtiss-Wright Corp.**'s Airplane Division at Columbus appointed J. E. Winchester to the engineering sales staff. He formerly was chief engineer of Slick Airways.

► **Pacific Division,** Bendix Aviation Corp. named R. C. Fuller assistant general manager, succeeding Mel Burns who resigned. Fuller has been general manager of Bendix West Coast. He formerly was sales manager of Pacific Division.

► **Aluminum Co. of America** announced retirement of George J. Stanley, vice-president and general sales manager. He will be succeeded by Ralph V. Davies, who has been an assistant general sales manager and who now will be a vice-president. Two other assistant general sales managers, Robert B. McKee and Donovan Wilmot, have also been promoted to vice-presidencies.

► **Boeing Aircraft Co.** named Norman Allen an assistant to the president to succeed O. W. Tupper, who has resigned. Allen, no relation to Boeing's president, William M. Allen, has been office manager of the accounting division.

► **Sherman Fairchild & Associates** appointed Martin V. Kiebert, Jr., a member of the firm. A radio and communications engineer, Kiebert will be a consultant to clients on aircraft telemetering, instrumentation, stabilization, servo mechanisms and remote control.

Aerial Fire Patrol

Marking the first time in the nation that air patrol actually will supplant large crews in a high fire danger area, use of planes in forest fire detection work on the Coeur D'Alene National Forest in Idaho will be inaugurated this summer, reducing about two-thirds the number of lookouts generally used during the fire season. The air arm will give the first 100 percent coverage compared to 69 percent previously.

Army Buys Lightplanes

Off-the-shelf purchases by the U. S. Army of two- and four-place civilian planes for Army Ground Force uses of liaison, communication and personnel transport, resulted in two contracts:

North American Aviation, Inc., Inglewood, Cal., for 62 four-place Navions, 30% spare parts, technical data, $510,962.

Aeronca Aircraft Corp., Middleton, Ohio, for 439 two-place Champions, standard except for Plexiglas roof and 85-hp. fuel injection Continental engine, $1,649 per plane plus 30% spare parts and technical information.

Navions are standard except for radio installation, jettisonable door and a few minor installations.

Both planes were demonstrated at Ft. Bragg, N. C., in competition with other "stock model" lightplanes in rough field landings and takeoffs simulating combat conditions. Planes were chosen on a basis of lowest bids of planes meeting the minimum requirements.

WAA to Liquidate Surplus Components

A program planned to liquidate all remaining surplus aircraft components by July 1948, with the 75 agents in the industry playing a major part, has been announced by War Assets Administration. Tentative target dates of Sept. 1 and Dec. 1 have been set for closing the sales-storage depots at Torrance, Cal., and Cleveland, respectively.

As of May, latest month for which figures are available, aircraft components originally costing $167,586,600 had been sold for $61,046,000, with agents accounting for material with an original cost of $66,317,718. This leaves in stock components that cost the government $775,329,000.

Inventories now in the hands of WAA agents will be screened, beginning immediately, and material segregated into three categories: as scrap; slow-moving or doubtful items, and saleable merchandise. Agents will be directed to sell the material in the first two categories at once under competitive bids, with supervision exercised by the regional chiefs of WAA's Aircraft and Electronics Division.

The balance of the inventory, classed as saleable, will be offered to the agent at cash. He can either obtain outside financing, or WAA will extend credit over a period not exceeding three years. If the agent turns down the offer, the inventory will be disposed of by competitive bid.

WAA's present arrangement with agents is to ship merchandise on consignment, with the government paying shipping costs. It is expected that by Oct. 1, agents will have inspected all surplus aeronautical material and filed their requisitions with WAA. Agents filing requisitions after Oct. 1 will pay shipping costs on the material. Under present plant, WAA will stop making allocations to agents on Jan. 1, 1948.

John H. Carey, WAA deputy administrator for aircraft and electronics disposal, said that if the speed-up policies and procedures are followed without major deviations, WAA "will be entirely out of the aircraft components parts business before July 1, 1948."

FLYING SADDLE BAGS

Bell Aircraft's special airmail helicopter, apparently an adaptation of the Model 47, with mail compartments on both sides of the fuselage. Each compartment has hooks for mail bags and capacity of the two together is about 500 lb. of mail. The "Airmailer," as Bell calls the new model, comes with open or enclosed cockpit.

AVIATION WORLD NEWS

British Turbine Craft Several Years Away

Jet expert claims eventual airline replacement of piston engine.

At least five years will elapse before British prototype turbine-powered aircraft will fly the air routes, F. R. Banks, widely known engine authority, told a meeting of engineers in New York.

A wartime air commodore and director of engine development, now director of Power Jets (R & D) Ltd., Banks outlined the British viewpoint on future aircraft propulsion before a joint meeting of the Society of Automotive Engineers, Institute of the Aeronautical Sciences, and American Society of Mechanical Engineers.

► **Piston Engine End Forecast**—Holding that even after this five year period some additional years will be required to accumulate sufficient numbers of turbine-driven craft and operating experience, his incidental forecast is that the termination of the overall period—about ten years hence—will mark the end of the high duty reciprocating aviation engine.

All future British plane projects—except for some small feeder or taxi types—will have turbojet or turboprop installations. Since no new piston engines are expected to be built by British manufacturers, ruled out is the probability of developing compound installations to attain increased power or fuel economy.

Any turbine-powered commercial-route flights, trans-Atlantic or even inter-city, before the lapse of five years will in all probability be purely experimental, without passengers.

► **Turboprop, Jet Uses**—Although British planning includes adoption of turbojet propulsion for both military and commercial craft, Banks disclosed that the turboprop is being developed mainly for airline operation. At present, more turboprop than turbojet units are coming off Britain's production lines.

Contrary to the popular conception of turbojet feasibility, he declared that this type of power would be used in short as well as long range craft, for example, in normal inter-city airline operation. Double the trips could be realized by halving present block-to-block times in cleanly designed craft incorporating considerable weight-saving. Ranges in excess of 3,000 mi. (4,000 in still air) are not foreseen for jet planes, and turboprops probably will be used for this purpose, although those presently under development in England are intended for planes of moderate range and altitude, with cruising speed of about 300 mph. It is believed that propeller efficiencies of 80 percent up to 550-mph. speeds could be attained in prop-turbine combinations.

► **Overhaul Periods Lengthened**—Present perfection of some British military turbojets enables overhaul periods to be stretched to 240 hr., with only an intervening visual inspection of the combustion chambers necessary at the 100-hr. mark. The 240-hr. achievement is attributed largely to even burning in the combustion chambers, thus avoiding earlier teardown necessitated by a "hot blade" caused by irregular burning.

It is felt that at least 300 hr. before overhaul should be attained before commercial jet operation is considered feasible.

► **Operating Problems**—Elimination of hazard to passengers will be an important factor in very high speed commercial turbine-craft flight, Banks said, even at 40,000 fts., "bumps" from rough air being a serious danger. This problem is far from solution.

Also, angle of descent of high speed craft would necessarily be flat, unless some air-braking means were employed. Pilot would have to start descent at a very low rate as soon as he had reached altitude—impractical for short trips. Reverse piping to deliver the jet stream in flight direction may permit a steeper glide path.

► **Speeds and Fuels**—It is expected to be about seven years before jet craft will consistently fly at speeds approximating mach .85 (about 650 mph. at sea level). Present safeguards and airport facilities probably must be refined before this high speed operation is feasible.

Research remains to be done also in the development of fuel for commercial turbine-powered craft. Less volatile fuels than the present military types will be dictated by safety consideration. Presently available "non-flammable" fuel oil freezes at about 0 deg. C., whereas for commercial craft operation a freezing temperature of about minus 40 deg. C. would be required.

Export Subsidiary

United Aircraft Corp. has organized a subsidiary, United Aircraft Export Corp., to handle foreign sales of all four United divisions, Pratt & Whitney, Hamilton Standard, Chance Vought and Sikorsky. The Export Corporation began operations last week with the discontinuance of United's Export Department.

Joseph M. Barr, who has been manager of the Export Department since 1944, has been elected president of the new corporation. Vice-president is E. K. Hubbard II; treasurer is James J. O'Shea; secretary is Paul Becker. Main offices of the corporation will be at the parent company's offices in East Hartford.

Mosquito Produced In 3 New Versions

(*Mc-Graw-Hill World News*)

London—Three new versions of the famed Mosquito and two new variants of the Hornet have been disclosed by De Havilland Aircraft Co. Ltd.

The Mosquito, one of a very few types of British warplanes still being made, has added three more variants. The Mark 37 Sea Mosquito replaces the Mark 33, which was the first twin-engined aircraft to operate regularly from carriers, and has a new type of radar scanner in its nose. So has the new Mark 38 night fighter. Both retain performance of their predecessors.

A departure is the Mark 39, adapted for target-towing, which carries a crew of three for its specialized function. Besides towing targets, the plane can be operated as a live target, at which other gunners may fire with live ammunition but with sights which have been given a fixed deflection. The bursts are recorded on film by a cameraman carried in the extended transparent nose of the target aircraft.

The two new Hornets are the Mark 3 long-range fighter, which has been given greater fuel capacity than the Mark 1, and the Mark 21 night-fighter Sea Hornet which incorporates a second cockpit for a navigator-radar operator behind the pilot's. This plane can be used alternatively for reconnaissance or for strike-navigator as leader of a formation of single-seat Hornets.

Fox Moth Price Reduced

The price of the De Havilland Fox Moth made by De Havilland Aircraft of Canada, has been reduced $1,000 to $5,450 as the result of improved manufacturing efficiency. The company reports that the Fox Moth landplane can now be changed over to a seaplane on 24 hours notice due to an increase of the stock of floats.

Canadian Tax Lifted

Canada's 15 percent travel tax has been removed from air services to those remote parts of the Dominion which have no practical means of surface transportation. The exemption is designed primarily to assist mining men and others traveling on business to the sparsely settled northern areas.

NACA Reveals New Results Of Supersonic Research Program

First full year effort on basic high speed problems indicates new design concepts and construction methods necessary; flight tests to begin in July.

By ROBERT HOTZ

The shape of supersonic things to come is now more distinct as a result of recently revealed data gathered in the first full year of basic high speed research by the National Advisory Committee for Aeronautics. NACA's return to basic research in spearheading the United States' effort to achieve supersonic flight marks a clean break with its wartime policy of concentrating on improving designs and tactical type aircraft already in existence.

Importance of this fundamental research program is indicated by the $12,000,000 increase of NACA's 1948 budget by an economy minded Congress that has drastically slashed funds for virtually every other government agency seeking an appropriation. NACA will get $43,449,000 for 1948, the bulk of which will be spent on supersonic research. The fiscal year just concluded saw NACA spend $30,713,000 primarily on the research program that has yielded the first usable data on the critical transonic range.

▶ **Tardy Entrance**—Although NACA and the United States made a tardy entrance into the supersonic research race, there is evidence that in the last year some of the other competitors have been unable to match the NACA pace.

Facilities now under construction indicate that this gap may be widened considerably during the coming year. Although the joint AAF–NAVY, NACA, JRDB plan for a billion dollar supersonic research center has been shelved in view of the chill economy winds blowing from Capitol Hill, work is well underway on a 6x8 ft. supersonic tunnel at Cleveland; a 4x6 supersonic tunnel at Langley and another freon gas free flight supersonic tunnel at Ames. The 16 ft. wind tunnel at Langley is being stepped up to 60,000 hp. to bring it up to transonic speeds.

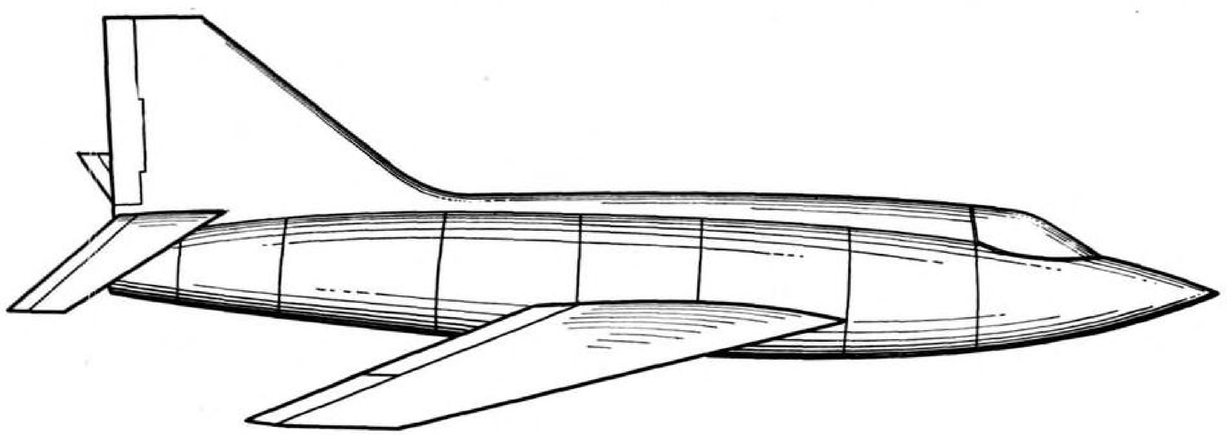
▶ **New Tests to Begin**—The NACA supersonic research has been conducted by three methods—wind tunnels including a free flight tunnel filled with freon gas that permits speeds up to Mach 4; rocket powered, remotely controlled free flight scale models and wing flow tests in which models are mounted at the point of fastest air flow on P-51 wings so that they experience transonic air flow while the aircraft to which they are attached is still flying at subsonic speeds. A fourth method—flight tests of full scale piloted research aircraft—will begin this month.

Indications are strong that some form of swept back wings will be required to negotiate the turbulent reaches of the transonic range. Indications are equally strong that once transonic control and stability problems are well in hand there will be a return to straight edge wings on aircraft designed primarily for supersonic speeds. Although the bulk of NACA wind tunnel and flight research has been concerned with characteristics of swept back wings, the Ackeret wing and other thin, straight edge types are now under investigation at supersonic speeds.

▶ **Wing Plan Problems**—Biggest problem with wing plan forms seems to be the fact that supersonic aircraft will have to be able to negotiate sub and transonic ranges before and after it operates at supersonic speeds. Intense effort is now being devoted to improving lift and stall characteristics of various types of wings that have demonstrated efficiency at high speeds but lack stability and make control difficult at subsonic speeds required for take-off and landing. Application of boundry layer air flow control through suction slots in the wings and use of various types of leading edge wing flaps and combinations of wing slots, vanes and spoilers are being investigated to improve low speed lift of high speed wings.

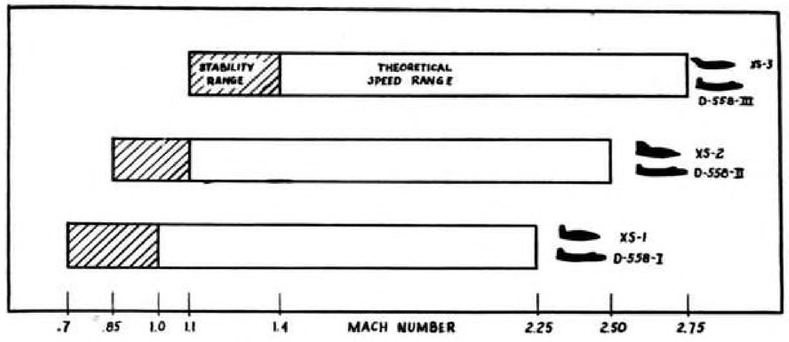
All possible wing plans have been investigated—various degrees of sweepback up to 85 percent; sweep forward; combination of forward and backward sweep on the same aircraft; triangular Delta wings and the trapezoidal shapes of the Ackeret type wing. Preliminary conclusions indicated better low speed performance from swept forward wings but that plan form was discarded when it became apparent that the high speed problems of swept forward wings would be more difficult than the low speed problems of swept back wings.

Delta wings with sweepback of less than



FIRST ILLUSTRATION OF BELL'S XS-2 TRANSONIC RESEARCH PLANE

Designed to explore stability and control problems between Mach number .85 and 1.1, craft has theoretical speed range up to Mach 2.5. Differing radically from XS-1, first high speed research craft, XS-2 has sweptback wings with negative dihedral; circular arc air foil; and sweptback tail surfaces. Like XS-1, it is rocket powered.



NACA'S 3-PHASE FLIGHT RESEARCH PROGRAM

Chart showing how NACA flight research program is planned to explore transonic zone to acquire stability and control data necessary for supersonic flight. Research will be conducted in three phases with two types of aircraft, one with rocket power, the other with turbojet power. Ranges of each pair of research planes will overlap to insure complete coverage of transonic zone where stability and control are critical problems.

65 degrees exhibited good high speed flight characteristic but with from 65 to 83 degrees sweepback, severe instability develops. At 83 degrees of sweepback the model, which looks very much like the folded paper airplanes that schoolboys make, rolled over and over. Although the Germans did considerable work with Delta wings they were never able to control them in flight or landing and take-off. NACA has successfully flown and controlled a model with 63 degrees sweepback and aspect ratio of two in its free flight tunnel at Langley Field. Landings and take-offs are made at a 30 degree angle.

▶ **Sweepback Effects**—Other effects of swept back wings include alleviation of gust loads by 40 percent with a 45 degree sweepback, an important factor in design of high speed transports; better spin recovery, and a bad tendency toward tip stall. Spinning characteristic of high speed planes seem to be universally bad in their present form due to the fact that the bulk of the aircraft load must be carried along the fuselage. High speed wings are too thin to carry fuel and armament loads as they do in conventional fighters. Spin tests on all high speed jet fighters from the P-80 through XF6U revealed unstable spin characteristics with the XF6U tumbling into an inverted spin after several turns.

The tip stall problem is being attacked by experiments with small vanes on the leading edge of wings to block the outward flow of the boundary layer air. Increased stability has been obtained by setting the wings at a 5 degree angle above the normal flight path of the aircraft.

▶ **Airfoil Types**—Three types of airfoils have been under intensive study in the high speed research program. One is NACA's own high speed airfoil series. The other two are the double wedge or diamond shaped airfoil and the circular arc. The circular arc is a modification of the diamond shaped airfoil in which both upper and lower surfaces of the airfoil are equal segments of an arc of the same circle. The Bell XS-2 will use a circular arc airfoil. It was originally planned to give the double wedge airfoil its initial flight test on the Douglas XS-3.

Experiments with various types of swept-back propellors have indicated that there is little hope at present for these types of propellors to equal the efficiency of jet power above 500 mph. A needle nose diffuser for jet air intakes on high speed aircraft has been developed to minimize turbulence from shock waves in the air intake. This type of nose seems particularly good for military aircraft since it permits mounting of guns and radar equipment in the nose diffuser.

▶ **Flight Tests**—The research flight test program, which began with a pair of specially modified Bell P-39's with swept back wings exploring landing and take-off problems of this type wing, will begin exploration of the transonic zone in piloted aircraft this month as NACA takes delivery on the XS-1. An AAF contract with Bell Aircraft Corp. to do high speed testing of the XS-1 still is pending but indications are that AAF probably will do the testing with military pilots to save money. Flight test program is to be conducted in three phases with one XS model and one D-558 type in each phase.

NACA technicians are altering the XS-1 instruments preparatory to flight. The D-558 Mark I is still being readied for acceptance tests by Douglas test pilot Gene May. Landing gear performance is still not completely satisfactory.

▶ **Lower Fringes**—First phase to be done by the XS-1 and the D-558 Mark I will explore the lower fringes of the transonic zone. Phase Two involves the Bell XS-2 and the D-558 Mark II both with swept back wings and lower aspect ratios than first phase planes. Douglas will build both third phase planes—the D-558 Mark III which will have extremely low aspect ratio stub wings and the XS-3 for which a design contract was given to Douglas last week. Phase Two will explore through the transonic zone into the fringes of the supersonic while Phase Three will be primarily supersonic. The Northrop XS-4 is designed principally to explore characteristics of tailless aircraft at high subsonic speeds.

According to Milton Ames, NACA Coordinator of Aerodynamic Research, the NACA flight test program for Phase One will take at least six months.

Helicopter Testing Towers Stress Blades

NACA and British research facilities offer hope for new study in rotary wing research

Rapid strides in helicopter design and development progress may be made possible by special helicopter testing towers now being perfected in both the U. S. and England.

Although the two towers vary widely in purpose and detail design, they are built on similar principles. Both will permit the testing of helicopter rotors out of range of "ground effect," which, because of the air moving down through the rotor and rebounding from the earth, produces complex airflow patterns. These patterns greatly impair data obtained in actual helicopter flight tests.

▶ **Langley Tower**—The U. S. tower was designed and built by the National Advisory Committee for Aeronautics at its Langley, Va., laboratory to perform fundamental research on helicopter rotor aerodynamics in order to simplify complex mathematical theories presently employed.

The tower, recently taken off the top secret list, has been in operation since October, 1946, stands 40 ft. high and is powered by a 1,500 hp. Packard marine engine, geared to turn the rotor at from 80 to 400 rpm., well above and below normal operating range of conventional helicopters.

The drive shaft is instrumented to provide data on thrust, torque, side force, pitch angle, cyclic pitch, drag angle, coning angle and vibration.

▶ **Use Winds**—The tower is located in a clear area permitting the use of ground winds of up to 20 mph. as a useful research condition. A special research use of the tower is the measurement of lift and the power required in a rotor at high tip speeds and angles of attack near stalling, which cannot be safely measured in flight tests of helicopters.

The British tower is being built by the Bristol Aeroplane Co. as an experimental and development unit for the testing of specific rotor designs for projected Bristol helicopters. As such it is far less elaborate and scientifically useful than the U. S. tower. The Bristol tower is 50 ft. high and is powered by 500-volt d. c. electric motor capable of producing 1,000 hp. at a motor speed of 700 rpm. To permit rotors to be tested to destruction, the tower is surrounded by a heavy torpedo safety net supported by nine heavy girders.

The tower is flexibly mounted and supported by six guy-ropes anchored into concrete foundations.

▶ **Tower Oscillation**—Purpose of this system is to impart to the rotor the same highly undesirable oscillations found in present helicopters, thereby providing a more accurate set of test conditions during operation of the tower. Slackening of the ropes will permit the tower to oscillate in harmony with any one of many frequencies, most of which must be damped out by fast and accurate manipulation of the various rope tensions.

New Canadair Four Is Hybrid DC-4, DC-6

Company expects successor to DC-4M-1 to fly soon, with first deliveries due in August.

Canada's newest bid for the Empire transport market, a 40-passenger DC-4, C-54 and DC-6 hybrid powered by improved Rolls-Royce British engines, is scheduled to take the air for the first time shortly under the designation DC-4M-4, Canadair Four.

Produced by Canadair Ltd., of Montreal, the plane is the successor to the DC-4M-1, a conventional DC-4 with Rolls-Royce Merlin engines. Initial deliveries are being promised for August, with full-scale output expected by November. Only announced customer at the moment is Trans-Canada Air Lines, now flying six DC-4M-1 planes originally built for Royal Canadian Air Force and loaned to TCA.

► **TCA Transport**—TCA's permanent long-range transport will be the Canadair Four, built with a shrewd blending of U. S. and British design features and knowledge calculated to appeal to other members of the British Commonwealth.

Canadair Ltd. was built and operated during the war by the Canadian Government, which a few months ago sold the plant to the Electric Boat Co., a U. S. manufacturer. While still owned by the Government, Canadair entered into a licensing agreement with Douglas Aircraft Co., under which the Canadian firm may build Douglas-type planes for sale in Canada and the United Kingdom. It will have to obtain special permission from Douglas to sell elsewhere.

► **Export Problem**—It is possible to foresee a set of circumstances under which Douglas would grant that permission should an Empire country state it would buy the Canadair Four, but not a U. S.-made Douglas. It is highly unlikely that the U. S. firm would refuse permission for the sale. The possibility of that situation arising is increased by close Empire trade relations and the dollar shortage prevalent in all countries.

Whether export considerations have entered into Canadair's calculations or not, the company is emphasizing the fact that content of the Canadair Four is 50 percent British Empire. A large part of this undoubtedly is the engine installation.

► **Rolls-Royce Engines**—Engines are Rolls-Royce Merlin 620's with .42 reduction gear. They drive Curtiss Electric three-bladed, full feathering reversible-pitch propellers. These engines are rated slightly lower than the 620's used in the DC-4M-1 which utilized a .471 reduction gear to drive four-bladed Hamilton Standard Hydromatic props.

With the 620 engines, rated at both take-off and for normal use considerably below the Pratt & Whitney R-2800 engines in the DC-6, Canadair claims a higher useful load and higher cruising speed than specified for the DC-6. The reason lies in the more or less familiar claim that a liquid-cooled engine can operate continuously much closer to maximum normal rating than can a higher-powered air-cooled engine.

► **80,000 Lb. Gross.**—The Canadair Four has a gross take-off weight of 80,000 lb. as against 81,462 lb. for the DC-6. Manufacturer's weight empty of the Canadair Four is 45,456 lb., leaving a useful load of 34,544. DC-6 manufacturer's weight empty is 48,151, and useful load 33,311. (DC-6 can operate at both higher useful load and maximum weight.)

The 620 Merlins are rated for take-off at 1,725 hp., against a dry rating of 2,100 hp. for the R-2800, or a wet rating of 2,400 hp. at take-off. Normal rating of the Merlins is 1,285 hp., and for the R-2800, 1,800 hp. Using maximum cruise power of 1,160 hp. per engine, the Canadair Four has a claimed speed at 23,000 ft. of 317 mph. At maximum cruise power, the DC-6 at 19,000 ft. and 84,000 lb. gross has a speed of 301 mph. At 60 percent of maximum continuous power, about 1,100 hp., the DC-6 at 23,000 ft. and 81,500 lb. gross weight has a speed of 300 mph.

► **Engine Plan**—Apparent plan of the Canadair Four's builders is to make it possible to operate the airplane at the maximum cruise power of 1,160 hp. per engine, about 90 percent of normal rated power, thus achieving the speed specified. Working in their favor is wartime experience indicating it is possible to operate liquid-cooled engines at near maximum power for extended periods of time, and the fact that the DC-4M-4 engines are so much lighter than the DC-6 engines.

Briefing Production News

► **Northrop Aircraft, Inc.** reports net sales of $8,063,111 for the period ending April 30, the third quarter of its fiscal year. Net sales for the nine months of the fiscal year total $24,641,278.

► **Boeing Aircraft Co.** has signed final papers with AAF terminating its B-29 production program, six years after the initial contract was granted. As amended, this called for 6,289 B-29's, of which 2,763 plus spares, were completed.

► **Curtiss-Wright Corp.'s** Airplane Division at Columbus has begun deliveries of the 10 modified B-17's for AAF ditching experiments which have begun off the Florida coast. Planes are radio-controlled, with special cameras recording results.

► **Bell Aircraft Corp.**, scheduled to shutdown for a two-week plant-wide vacation beginning July 26, is urging shippers not to send materials which will arrive after July 22. Bell has delivered more than 80 helicopters since the first of the year, according to Secretary Leston P. Faneuf.

► **Minneapolis-Honeywell Regulator Co.** has opened a southwest district office in Fort Worth for its Aeronautical Division, with Claude H. Smith in charge. M-H also has established a Mexican subsidiary, Honeywell-Brown, S. A., with headquarters in Mexico City on Calle De Ramon Guzman. Manager is Virgil H. Hiermeier.

► **Boeing Airplane Co.'s** Wichita division is at work on a new Navy contract for $400,000 worth of spare parts for N2S Kaydet trainers.

► **United Aircraft Corp.** has signed a new licensing agreement with Autogiro Co. of America under which it acquires the privilege of using more than 200 patents in all its production of Sikorsky Helicopters. United had a wartime license which covered only government procurement.

► **Curtiss-Wright Corp.'s** Propeller Division has bought from War Assets Adminsitration a 19-acre plant containing 220,000 sq. ft. of floor space. The new plant, adjacent to the main facility at Caldwell, N. J., cost C-W $2,900,000 and gives the Propeller Division a total of 750,000 sq. ft. The Division has signed a new contract with its I. A. M. union for a wage increase of 8 cents an hour retroactive to May 15, 1947, and an additional 2 cents effective Dec. 1, covering 2,050 employees.

► **Glenn L. Martin Co.** has completed sufficient tooling for the modified wing and tail structure of the 2-0-2 to resume production upon receipt of CAA certification.

► **Fairchild Engine & Airplane Corp.'s** Duramold Division is closing its Jamestown, N. Y., plant and moving operations to the airplane plant at Hagerstown, Md., and the Pilotless Planes Division at Farmingdale, N. Y.

► **Allis-Chalmers Manufacturing Co.** has formed a new turbo-power development department which will deal chiefly with engines for ships, locomotives and stationary power plants. It is headed by R. C. Allen, former head of A-C's steam turbine work.

► **Brown Instrument Co.**, a subsidiary of Minneapolis-Honeywell, has announced it will stick to a firm price basis and that it has eliminated the labor-material escalator clause in its sales contracts.

► **E. I. Du Pont de Nemours & Co.** has trade marked the name "Strux" for its cellular cellulose acetate plastic used as a core in many laminated materials for aircraft purposes.

► **Pacific Airmotive Corp.** has moved into its new headquarters and overhaul base adjacent to Lockheed Air Terminal, Burbank, Calif. The $2,000,000 plant covers 180,000 sq. ft.

► **Breeze Corporations, Inc.** plants and offices will be closed July 28-Aug. 11 for vacations. Materials should not reach plants later than noon July 25, or before Aug. 11.

Admiral Rosendahl Heads Airship Study

$70,000,000 sought for operation of seven giant dirigibles on overseas passenger route.

By BLAINE STUBBLEFIELD

There's always a chance the U. S. will try commercial rigid airships while the indefatigable Rear Admiral C. E. Rosendahl (ret.) fights for it. Commanding a new drive, in civies and unmuzzled by the Navy, he's out for lighter-than-air as a desirable intermediate between fast airplanes and slow surface ships.

Three scores for his side from the outset: (1) Russian development of rigid airships which, among other things, are browsing in North Polar regions; (2) A report by the Air Coordinating Committee, which straddles but concludes ". . . the engineering and technical foundation for the construction of safe and successful lighter-than-air exists;" (3) Goodyear Aircraft Corporation is strongly supporting him, though it declines to be identified with any promotion.

The Rosendahl group is working on a three-way campaign:

► **First,** it has organized some private capital which is financing a serious study of technical and economic possibilities and risks. If the study is favorable, the capitalists will back a project and hope for government assistance.

This group's tentative aim is to pledge $70,000,000 for eventual construction and operation of seven 10,000,000 cu. ft. rigid airships, presumably on an overseas route.

► **Second,** they have approached the Presidential committee now studying rehabilitation of the Merchant Marine, with the hope that the contemplated act of Congress will authorize a subsidy program for lighter-than-air along with surface ships.

The Merchant Marine Act of 1936 directed the Commission to report on subsidies for airplanes and/or airships. Grover Loening made the study, reported favorably, and Congress by-passed it.

► **Third,** the Rosendahl group hopes to persuade some organization to set up a pilot operation with Navy K type surplus blimps, which can carry up to about 20 passengers, depending on modification, which would give the public and Congress a sample of "air yacht" travel and might lead to larger operations. Blimps have carried 400,000 passengers without an injury—a perfect safety record.

If Sea-Air Committee's drive for the right to use aircraft fails, as it seems likely to, shiplines may give serious attention to dirigibles. Some observers feel that CAB would not refuse them lighter-than-air rights, since the airlines have passed up the opportunity. CAB could be deprived of jurisdiction by an act of Congress authorizing subsidies under the Maritime Commission. Congress could establish a separate lighter-than-air commission, which the airshippers would like still better.

► **Report Gives Data**—The 39-page ACC report contains basic technical and economic data on the whole subject.

Industry Observer

► **McDonnell Aircraft's parasite fighter—XP-85—will be dropped with its wings folded from a B-36 bomb bay. Wings are supposed to unfold as the parasite falls clear of the mother plane. Recovery will be effected in the air by prewar dirigible technique. Mother planes will carry a combination of up to three parasite fighters and variable bomb loads.**

► New version of the British Nene jet engine will develop 5,750 lb. static thrust but U. S. engine manufacturers are not worried because domestic jets topping this power output are already in advanced stage of development.

► **Grumman's F9F, which will be powered by an earlier version of the Nene to be manufactured in this country by Pratt & Whitney, is nearing flight test stage. First F9F's, however, will be powered with imported engines.**

► Navy is having the same armament trouble with its first operational jet fighter — the McDonnell FD-1 — that bothered the AAF with early P-80's. Forward bulkheads have to be materially strengthened to avoid popping rivets when guns are fired.

► **Control of guided missiles over long ranges between launching ramps and targets is the subject of intense research now under way by push button warfare experts. Most promising lead seems to be automatic celestial navigation that guides the missile through automatic fixes on predetermined celestial bodies.**

► Observers who follow the trend of feeder lines closely wonder if the dearth of suitable planes for short haul operators may not stimulate Douglas to revive its prewar DC-5 for service as a feeder-liner.

► **Both TWA and Lockheed are reported to be unhappy about the $750,000 hull damage suit filed by the airline against the manufacturer as a result of the Constellation crash last summer at Reading, Pa. Strong indication is that TWA would not have filed suit without heavy pressure from its insurance agency, Aero Underwriters, which made original payment for hull loss damages. As a test case, the suit will require subrogation of any damages that may be won to Aero Underwriters. TWA's original claim against Lockheed for consequential damages covering loss of revenue during time Connies were grounded by CAB, were dropped during negotiations for cancellation of 18 model 649 Connies last winter.**

► When and if Menasco's giant new turbojet engine is perfected and made available commercially, Lockheed Aircraft Corp. will have a corner on its initial production. Lockheed holds an option for the first 250 engines Menasco produces which may give the Burbank firm a head start in the jet transport race. Lockheed management has indicated it will not absorb Menasco.

► **Howard Hughes paid tribute to the California weather by ordering erection of a 77,000 sq. ft. flameproof canvas tent over the Hughes flying boat at Long Beach harbor. It will be supported by a framework of 84 tons of tubular steel. Boat will not be launched before senatorial investigators headed by Michigan's Homer Ferguson arrive on the West Coast July 10 to probe Hughes' wartime activities, including his flying boat development contract.**

► Australian government has voted $3,136,000 for production of gas turbines by Commonwealth Aircraft Corp. in Melbourne. The firm will make Rolls-Royce Nenes under license.

► **Aircraft designers will be watching closely results of new University of California research on efficiency of pilots in prone positions. One hundred students, all former AAF and Navy pilots are acting as guinea pigs in the experiments which will probably require two years for completion.**

► Costs of NACA wind tunnel test models has skyrocketed from an average of $2,500 in 1940 to $20,000. Aircraft engine testing now costs about $747 per hr. in contrast to $16 in 1939 and $225 in 1943.

► **A flat surfaced "astral window" will replace the astrodome in the Boeing Stratocruiser. Flat surface is designed to withstand more stress than the bubble type dome, two of which blew out in Constellations on transatlantic crossings while using the cabin pressurization system.**

► Joint Army-Navy Board is conducting studies to discover the United States industrial bottlenecks most vulnerable to air attack.

Beech Releases Details and Photos of Feederliner

Beech Aircraft Corp. last week scheduled an early test flight for its unique Model 34 transport, designed to fit the purpose of almost any local service airline by provision for change-over from passenger to cargo space in a matter of minutes.

► **Estimated Performance**—Until the plane flies, Beech is sitting on estimated performances and many other details, except for takeoff distance—a strong selling point to local service operators. Preliminary estimates indicate it will take off, in accord with CAA regulations, with one engine dead and clear a 50-ft. obstacle within 2,600 ft. at sea level. At an elevation of 3,000 ft., the distance would be 3,100 ft. Although designed as a short-haul carrier, the Model 34 has fuel capacity for a maximum range of 1,400 mi., with a 45-min. reserve.

Model 34 is a high-wing monoplane with a modified V tail. The angle of the two surfaces on the transport is more acute than that of the tail of the Beech Bonanza, the four-place plane which made the first civilian use of this configuration. The powerplant also introduces features new to U. S. transports. The engines are buried, with four engines driving two propellers.

► **Lycoming Engine**—Beech calculations have been on the basis of using Lycoming S-580 engines, although recently it has started testing an unidentified Continental model. The Lycoming engine is normally rated at 320 hp., but develops up to 375 hp. at 3,400 rpm. for takeoff.

Fully supercharged, the Lycoming is a flat eight-cylinder engine which fits into the wing. The engines are arranged spanwise, driving the propellers through gears.

► **Seating Plan**—On the left-hand side of the cabin, looking forward, is a single row of four seats. On the right hand side, with no entrance door taking up space, there is a double row of five seats. At the front of the cabin, along each side, are seats for six more passengers, three on each side. Forward of these seats, beyond a bulkhead, is the cargo compartment.

Cargo compartment can be enlarged as needed by removing a seat at a time from each side. The bulkhead, complete with entrance door, is movable, so the cargo compartment can be segregated and hidden from the passengers' view in any one of the varying adjustments. After enlarging the cargo compartment, the interior of the airplane looks the same as before.

► **Folding Seats**—Main secret of Beech's variable interior are the seats. Beech engineers say they realize that the seats might be needed at a subsequent stop, so they must be carried in the airplane at all times. Therefore, they are arranged to fold up out of the way, with their front legs snapped into fasteners on the ceiling of the compartment. The folding operation for each pair of seats, it is claimed, takes about one min. Moving the bulkhead requires two additional min. All of this, according to Beech, can be done by one attendant. In five min., the company says, the entire forward space occupied by the six seats can be converted for cargo use.

Scale Model, Beech 34

With Cargo Bulkhead Forward, 20 Seats

Cargo Bulkhead Moved Aft; 14 Seats. Note Baggage Lockers

Two-place experimental United Helicopters Inc. craft shown with company's head, Stanley Hiller, Jr.

Hiller Simplifies Design To Cut 'Copter Production Costs

New approaches to simplified design to facilitate both production and maintenance are revealed in these exclusive AVIATION WEEK design detail photos of the United Helicopters, Inc. Commuter.

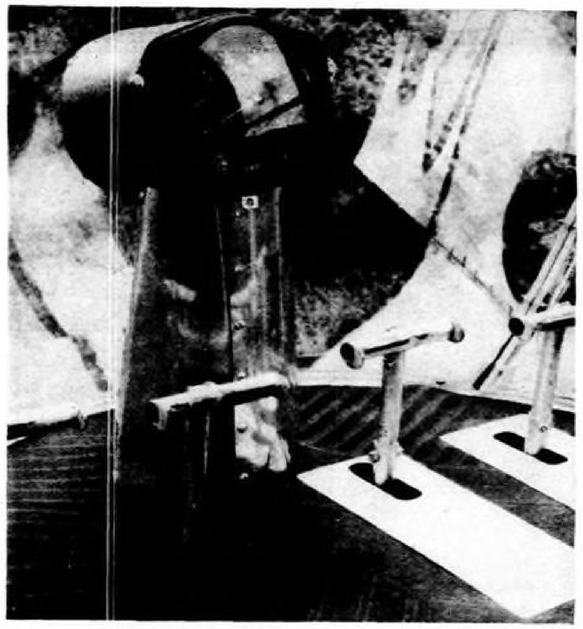
Many of these features will be incorporated in production models of the Commuter, Stanley Hiller, youthful head of the company told AVIATION WEEK. Principal changes, he reports, will be in a new control system now under development. Meanwhile, three aircraft embodying the principles shown here are continuing flight testing.

(*This article continued on page 30*)

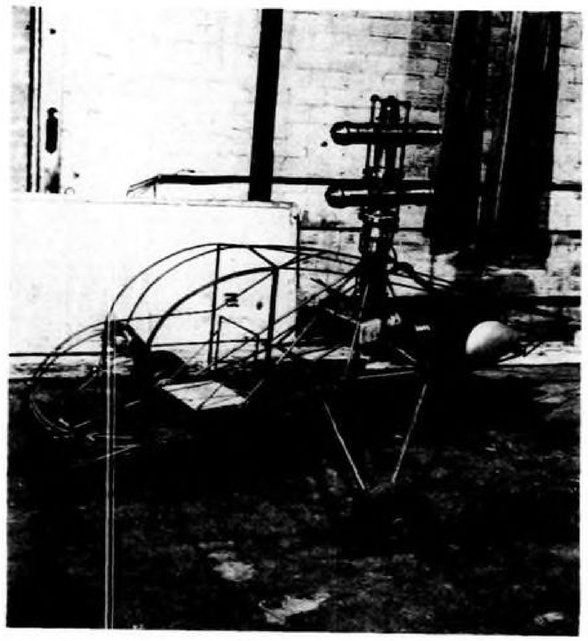
To gain access to engine assembly two bolts are removed from within pilot cabin and entire tail cone removed as unit. This operation can be completed within one minute.

Maximum visibility was sought by Stanley Hiller, Jr. in designing Commuter cabin. Nose bubble is of heavy Plexiglas having little optical distortion. Stress members are carried under cabin.

Newest craft of young inventor includes features aimed at getting retail sales price down and keeping maintenance charges in line.



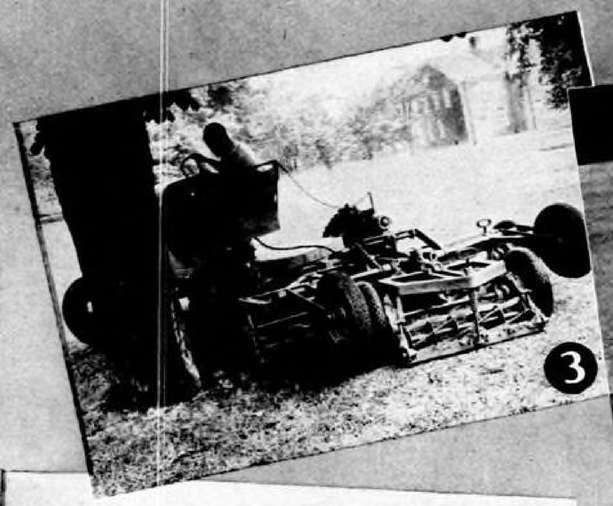
Clean appearance and simplified design are accomplished by instrument "pedestal" (left) in which single dial incorporates electric, oil temperature and pressure, fuel quantity and fuel pressure and tachometer readings. Closeup (right) showing engine with cooling fan installed. Fan operates on downdraft principle, drawing air through ducts in forward area of rotor base housing atop fuselage. Transmission gears will be installed on tubular structure just aft of seats, being secured by four bolts. Engine and rotor control cables are gathered in area directly over fuel tank and are readily accessible for maintenance.

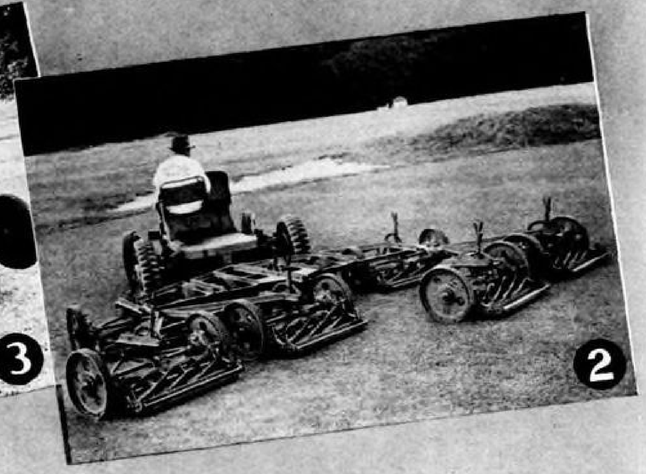


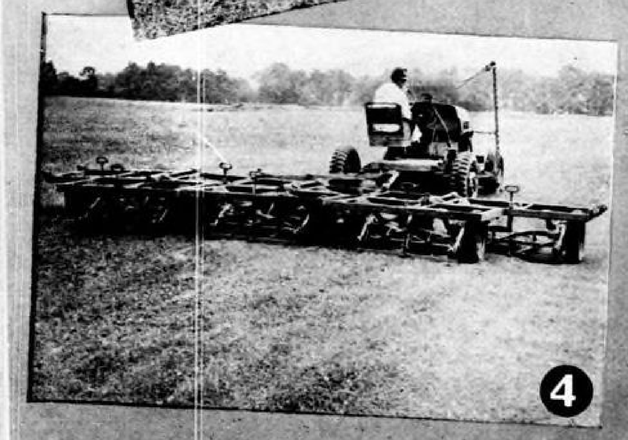
Before and after—in more ways than one. At left is shown first 'copter built by Hiller to test coaxial rotor blade theories. Based on flight tests with this craft further development was carried on, resulting in present craft shown at right. Though advanced in every respect from prototype, further design simplification work is in progress before large scale production is undertaken.

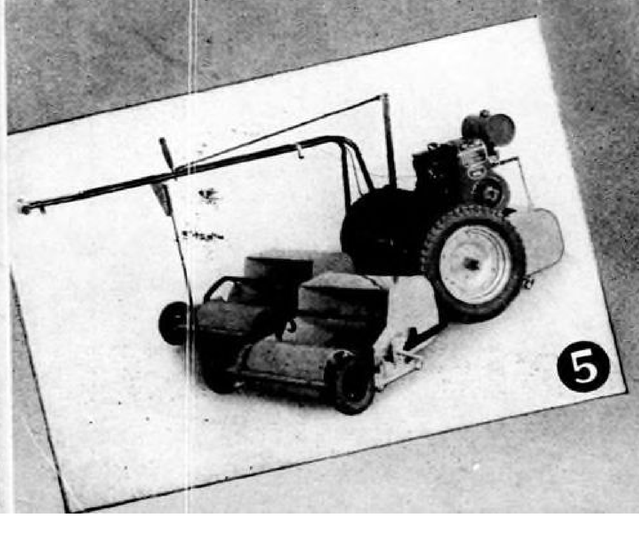
For Every Large Area Grass Cutting Job, There's a

WORTHINGTON SPECIALIZED MOWER









1 **"CHIEF" TRACTOR**

This rugged, powerful tractor is specifically engineered to team up with gang mower units for fast, economical work. Powered by a 100 hp. Chrysler industrial engine, the "Chief" has four forward speeds from 7.5 to 47.5 m.p.h.—a complete range for every working condition.

2 **STANDARD FAIRWAY MOWER**

Available in 3, 5 or 7 gang units, the fast-working Worthington Fairway gang mower maintains golf fairways and other large grass areas with a minimum of labor, time and cost. Individual gang units may be quickly added or withdrawn and the gang can be easily attached to any type of wheel tractor.

3 **RANGER**

The Ranger attachment consists of a Worthington Grass Blitzer type triple gang mower with its own hydraulically operated transportation wheels. A touch of the control lever and the entire gang mower is lifted and the transport wheels set down. Its 7 foot cutting swath (3 — 30" units) makes quick work of cutting jobs at parks, cemeteries, estates, institutions and highways.

4 **GRASS BLITZER**

The 9 gang is capable of mowing 46 acres per hour at a speed of 20 miles per hour. Ruggedly built for duty on airfields, golf roughs and road approaches, the sturdy "Grass Blitzer" is available in 3, 5, 7 and 9 gang units — a size and capacity to fit any need. The 10" reel with 4, 5 or 6 blades will answer the needs of your own local conditions.

5 **OVERGREEN**

A combination greensmower, tee mower, gang mower and utility tractor, the Overgreen disposes of cutting jobs quickly and thoroughly at a minimum of cost and effort. It is particularly effective on greens where its speed, capacity and efficiency really lighten the maintenance load.

DELIVERS FAST, LOW COST MAINTENANCE OF

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Overton & Ross
Houston 3 Phone Charter 4-0656
Overton & Ross, Inc.
Wichita Falls Phone 2-5278

UTAH
The Salt Lake Hardware Co.
Salt Lake City 9 Phone 3-5771

WASHINGTON
Bryant's Marina, Inc.
Seattle 5 Phone Melrose 0090

WISCONSIN
Sales Department
Jacobsen Mfg. Co.
Racine Phone Prospect 6539

NON-EXCLUSIVE

NEW MEXICO
Morrow & Co.
Albuquerque Phone 9187

WYOMING
Wortham Machinery Co.
Cheyenne

CANADA

ALBERTA
C. N. McKeown
Calgary Phone M5103

BRITISH COLUMBIA
Dominion Drag Saw Co., Ltd.
Vancouver Phone 9825

MANITOBA
Ward Williams
Winnipeg Phone 43 733

NOVA SCOTIA
Faulis Engineering Sales, Ltd.
Halifax

ONTARIO
Wm. Rennie Seeds, Ltd.
Toronto 2 Phone Elgin 9381

QUEBEC
John C. Russell
Montreal 3 Phone Office: Marquette 7456

SASKATCHEWAN
Kramer-Church Tractor Co., Ltd.
Regina Phone 3330

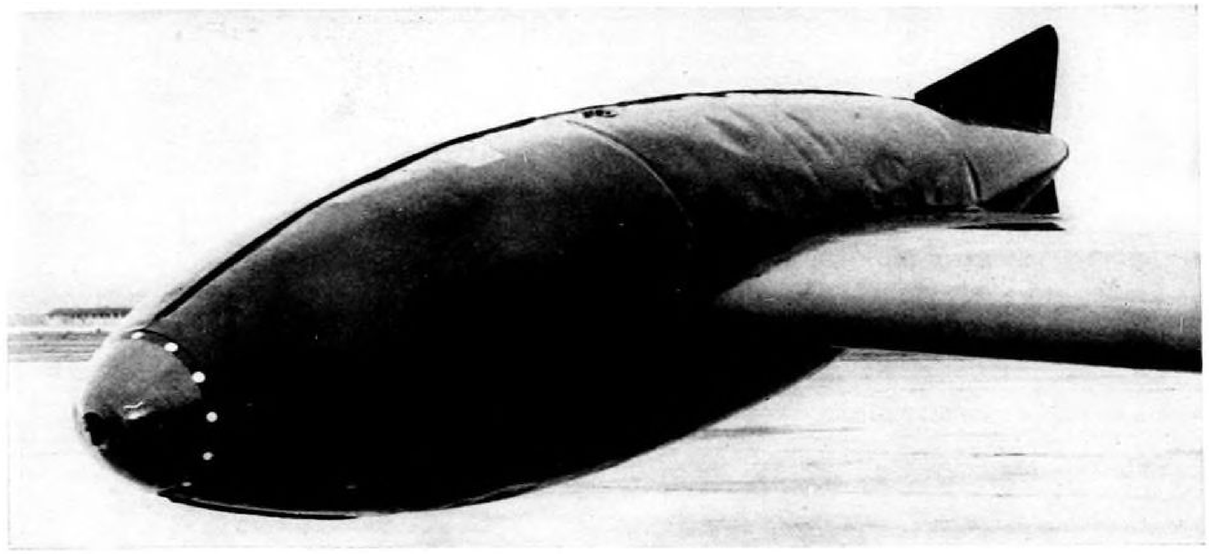
EXPORT
Henry R. Jahn & Son
New York 4 Phone Bowling Green 9-6544

WASHINGTON REPRESENTATIVE
Mr. John M. Holmes
Washington 5, D.C. Phone District 9648

WORTHINGTON MOWER COMPANY

STROUDSBURG, PENNSYLVANIA

Subsidiary of JACOBSEN MANUFACTURING CO., RACINE, WISCONSIN



Better Air and Ground Handling Attained in North American XFJ-1

Navy's trim jet fighter has spring-released non-fouling wingtip tanks, also low-swirl dive brakes, and handy kneeling gear to ease positioning, stowage.

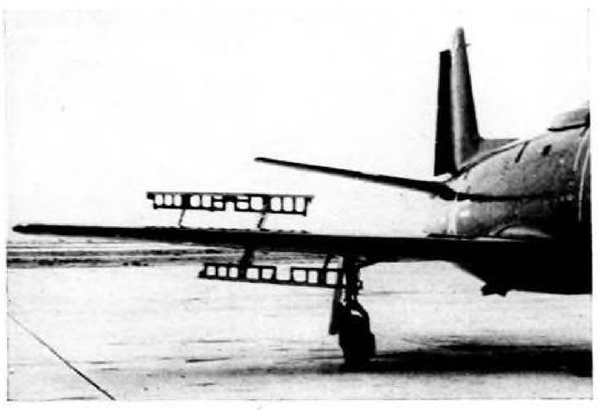
Disclosed for the first time at Muroc Army Air Base is an "aerodynamic release" wingtip tank fitted to North American's 550-plus mph. XFJ-1 Navy jet fighter (top). Feature of the installation is method of jettisoning. When attachment lugs are released, a spring operates to push the tank away from the wing, the induced "horizontal lift" acting to pull it out of the flight path. Upper and lower fins on the tank's aft end serve to stabilize separation from the wingtip, thus preventing the tank's rear from whipping inward and striking aileron.

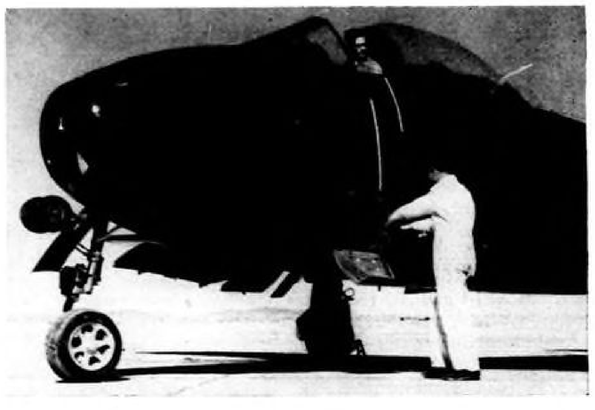
To insure that application of the XFJ-1's dive brakes will not cause large swirls resulting in tail buffeting, the perforated units seen at lower left are employed, creating only small vortices. Although comparatively little braking surface is apparent, this perforated configuration is effective, since drag does not decrease proportionately with decrease in area of surface presented.

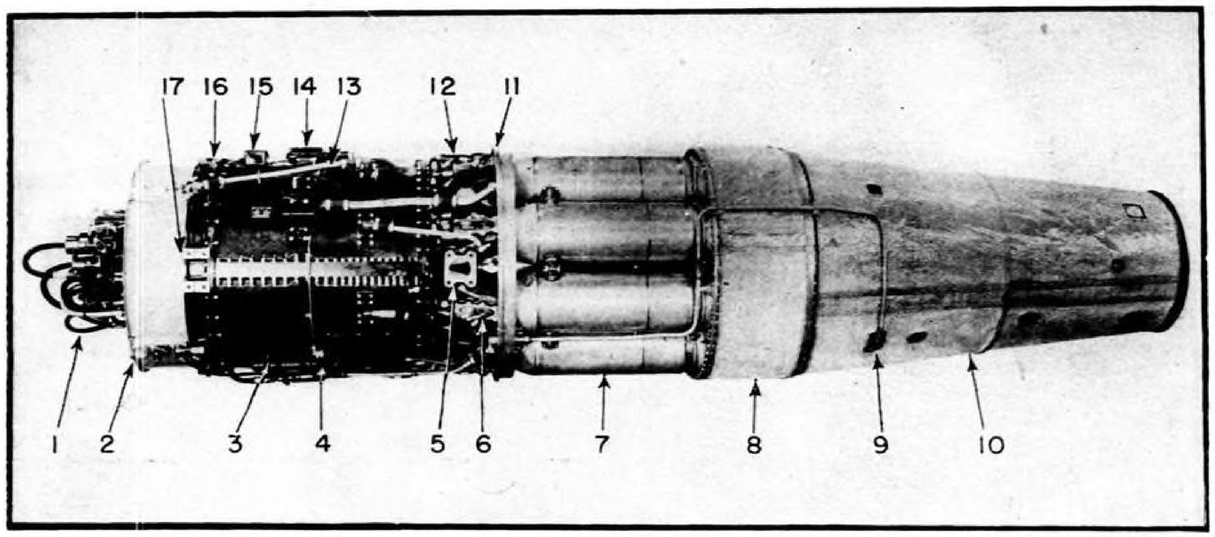
For easier ground handling and closer stacking on carrier deck or in the hangar, the XFJ-1 is equipped with kneeling nose gear (lower right). Two telescopic cylinders attached to the nose wheel strut are employed to raise or lower the nose gear independently of the main gear. A lock-pin engages the cylinders and the landing gear control handle is set at neutral. With the dolly installed on the nose strut, a control valve in the fuselage radio compartment forward of the wing leading edge is set for kneeling. Hydraulic hand pump, also located in the compartment, is operated to lower the nose of the craft until the gear is completely retracted and the dolly rests on the ground, taking the weight of the craft.

To raise the nose, the control valve is set at unkneeling position and landing gear control handle placed in the down position. Operation of the hand pump then fully extends and locks the nose gear for normal usage.

The craft is powered by an Allison-made General Electric TG-180 turbojet (analyzed elsewhere in this issue), and has very thin laminar flow wings, the fuel tanks being housed in the fuselage. (Photos at top and lower left by A. U. Schmidt).







LEFT SIDE VIEW of TG-180: (1) Engine accessories, (2) forward air guide, (3) flow divider, (4) ignition transformer, (5) horizontal main mounting trunnion, (6) fuel nozzle connection, (7) combustion chambers, (8) turbine casing assembly, (9) turbine wheel cooling air line, (10) exhaust cone assembly, (11) engine firewall baffle, (12) midframe, (13) thrust balancing pressure line, (14) bearing cooling air filter, (15) electrical junction box, (16) forward frame, and (17) horizontal forward mounting trunnion.

Design Analysis of

The General Electric TG-180 Turbojet

Revealed here for the first time are engineering details of the most widely specified American jet power plant—data prepared exclusively for AVIATION WEEK by a top designer closely connected with the development project.

By NEIL BURGESS

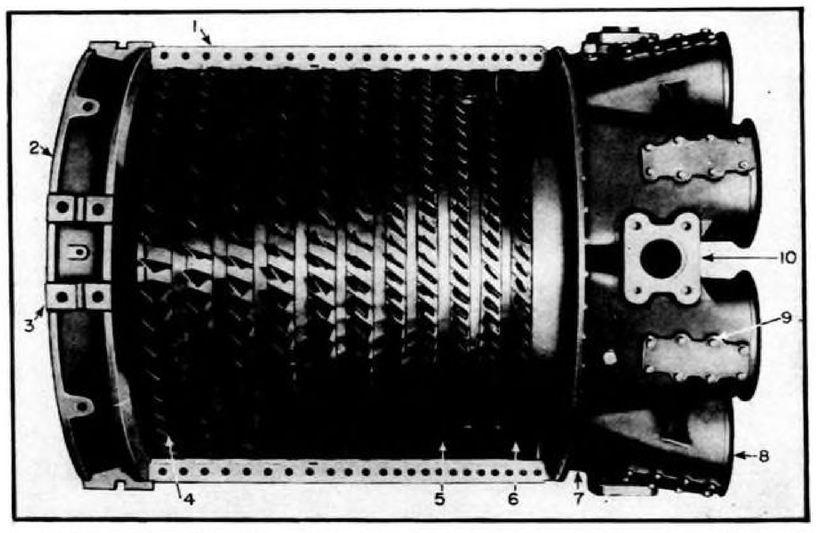
Aircraft Gas Turbine Engineering Div., General Electric Co.

Most extensively adopted American turbojet today is General Electric's axial flow TG-180 (J-35). Installed in a wide variety of the latest military craft—bombers, fighters, a transonic research plane, and other types as yet undisclosed—this jet plant evidences an exceptional degree of design refinement, displaying a notable minimizing of exterior piping and gadgetry.

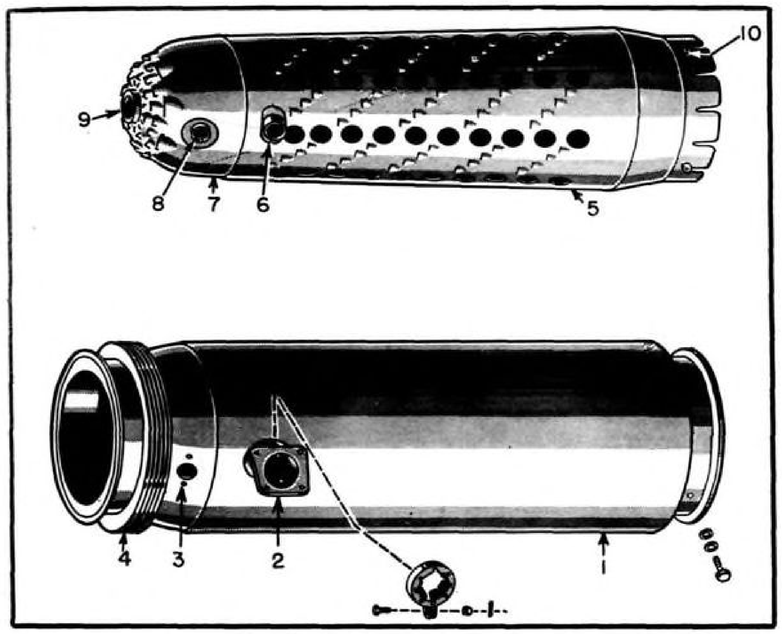
Development of the TG-180 was initiated by GE in May, 1943, at request of the AAF Air Materiel Command. First test flight with this turbojet was in Republic's XP-84 in Feb. '46. Several engine models are being produced, differing principally in minor installation requirements of the various craft in which employed (Convair XB-46, Douglas XB-43 and D-558, North American XFJ-1 and XB-45, Martin XB-48, Northrop YB-49, and P-84).

▶ Axial-Flow Compressor—The compressor consists of eleven bladed disks shrunk on a

(Continued on page 39)



COMPRESSOR ASSEMBLY with upper half of casing removed. Details are: (1) Compressor casing, lower half, (2) forward frame, (3) mounting trunnion, (4) first stage rotor disk, (5) stator blade, (6) eleventh stage rotor disk, (7) midframe, (8) combustion chamber opening, (9) for fuel nozzle opening, and (10) main mounting trunnion.



TYPICAL COMBUSTION CHAMBER: (1) outer chamber, (2) outer cross ignition tube assembly, (3) ignitor plug flange, (4) expansion bellows—internal on most models, (5) combustion liner, (6) ferrule for cross-ignition tube, (7) liner dome, (8) ignitor plug ferrule, (9) fuel nozzle ferrule, and (10) liner support boss.

steel shaft and enclosed in a cast aluminum outer casing. First ten disks, forming first ten stages, are machined from aluminum forgings; eleventh disk—last compressor stage—is a heat-treated steel forging directly linked by a splined fit to the turbine shaft.

Compressor rotor blades, forged and coined to size, are attached to disk rims with trapezoidal-shape dovetails. The disks are connected by cylindrical aluminum spacer rings shrunk under the rim shoulders, and each disk is secured to an adjoining spacer ring by steel pins to carry the driving torque.

Compressor casing (stator) is horizontally split into halves, bolted together around rotor and secured at the ends to the cast aluminum alloy forward frame and midframe. These frames are the main mounting structure of the unit, and, unlike compressor casing, are not split. Stator blades, also forged and coined to size, are dovetailed into split rings, in turn assembled into the stator halves. Eleven rows of stationary blades are used, followed by two rows of final straightening vanes. Accessory-drive casing is bolted to the forward frame, which also acts as a bearing support for the front (No. 1) bearing. Midframe, at rear of compressor casing, supports the main turbine structure, or aft frame, and serves as a support for main thrust (No. 2) bearing. Engine main mounting trunnions are on the horizontal and vertical centerlines of midframe, located at the unit's C.G.

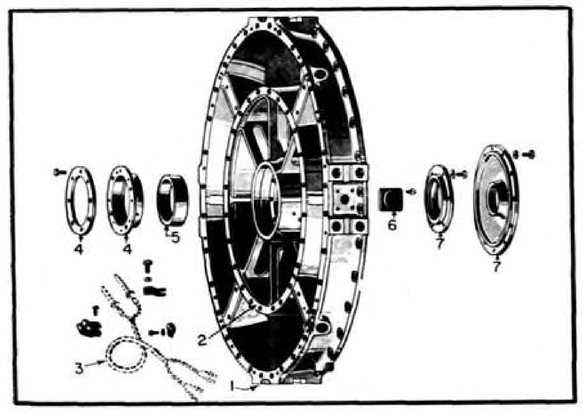
► **Combustion Section**—Eight cylindrical combustion chambers, supported by the midframe and the aft frame, are mounted circumferentially around latter, and are joined to the frames by clamping rings. Each combustion unit consists of an outer chamber fitted with removable liner and fuel nozzle, two of the eight chambers being fitted with ignitor plugs.

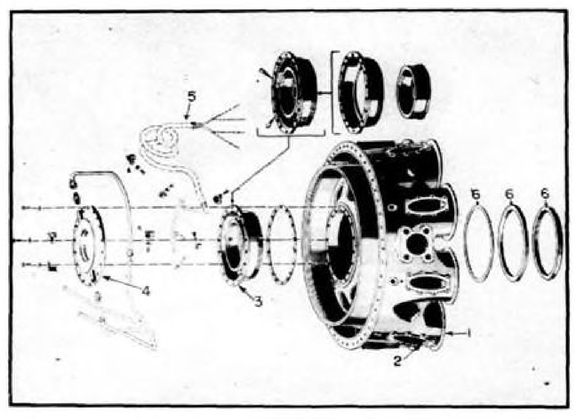
During combustion, some compressor air is admitted to the liner at the dome, or front cap; balance of compressor air is fed to the liner throughout its length via holes and louvers in the shell, thus serving to dilute the very hot gases in the dome region to the desired turbine inlet temperature (about 1,500 deg. F.) and keep the liner cool. Combustion and dilution processes are complete when the combustion gases reach turbine nozzle diaphragm.

Combustion chambers are joined near their forward ends by cross-ignition tube connections into which inner crossover tubes are inserted, thus linking the individual liners and spreading combustion from one chamber to the next. At aft end of each liner, a transition piece distributes the hot gases to the turbine nozzle diaphragm. The engine is designed to permit ready replacement of transition pieces and liners without engine disassembly.

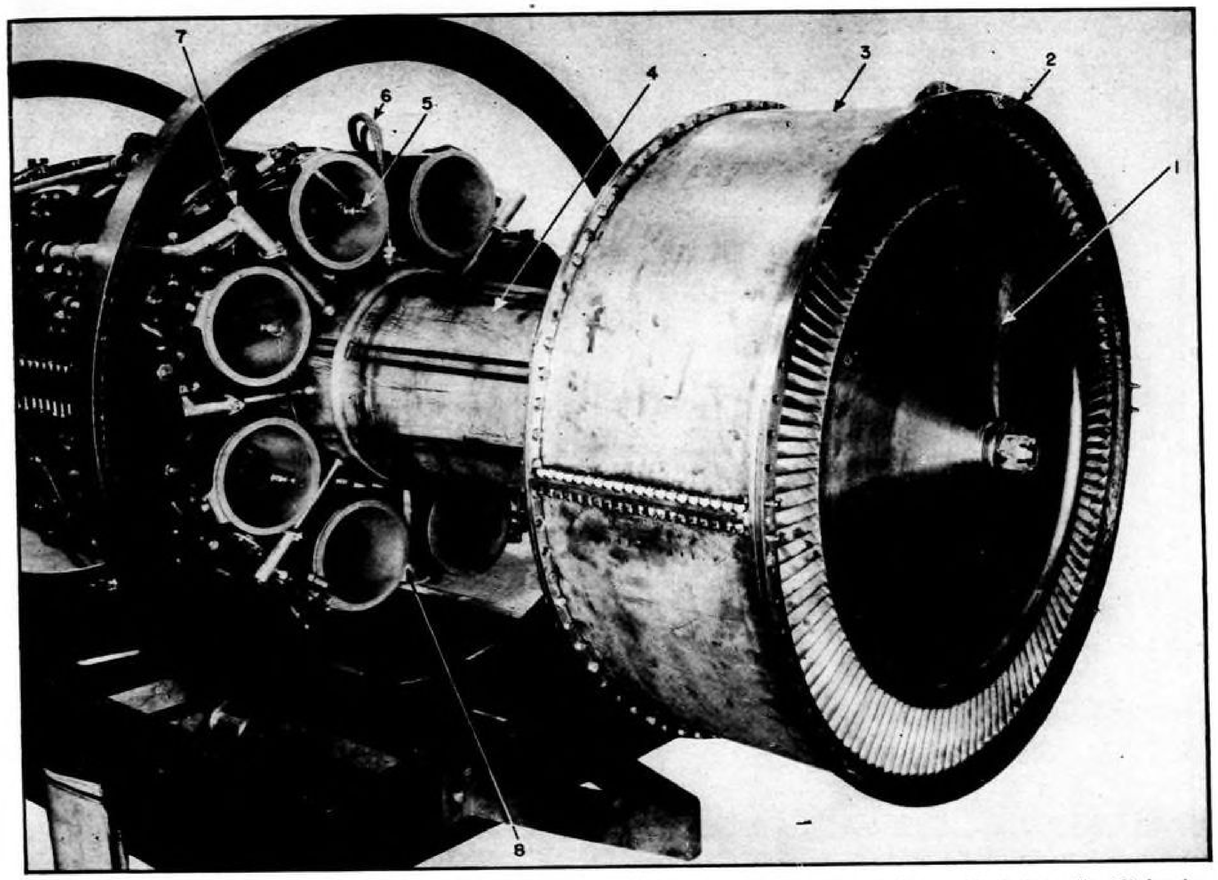
Aft frame is bolted to midframe, provides support for the entire turbine and exhaust assemblies, and also embodies the support plate to which combustion chambers are connected. A fabricated assembly of stainless steel, it utilizes internal longitudinal hat-section stiffeners.

Immediately aft of midframe, a firewall





FORWARD FRAME ASSEMBLY (at left): (1) Lower trunnion, (2) flange for bolting gear casing, (3) bearing thermocouple, (4) No. 1 bearing housing, (5) bearing outer race—inner race is assembled on rotor, (6) screen for air vent openings, and (7) bearing oil seals. Midframe assembly (at right): (1) combustion chamber opening, (2) fuel nozzle port, (3) No. 2 bearing housing, (4) bearing oil seal, (5) thermocouple, and (6) parts for assembling No. 2 bearing housing.

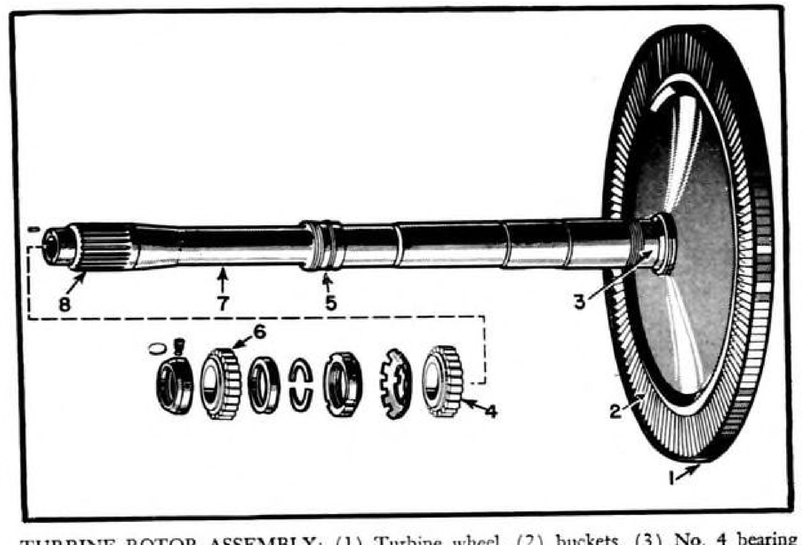


THREE-QUARTER VIEW of engine in disassembly stand with exhaust cone and combustion chambers removed. Parts are: (1) Turbine wheel, (2) flange for bolting to exhaust cone, (3) turbine stator casing, (4) aft frame, (5) fuel nozzle, (6) bearing thermocouple harness, (7) typical bearing cooling air connection, and (8) drain connection for lubricating oil and cooling air.

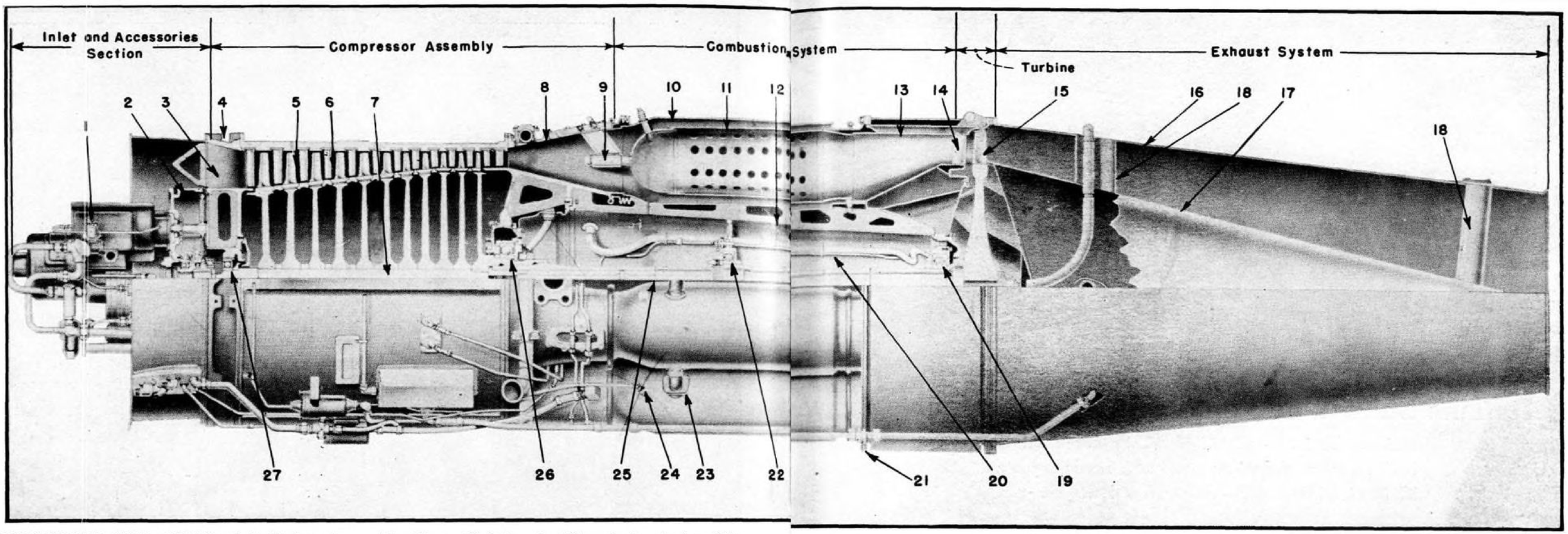
baffle isolates the front part of engine with its fuel and lubrication piping from the hot turbine parts at the aft end. While no engine cooling is required aft of the firewall, ventilation or insulation is normally required to protect the aircraft structure from radiated heat. The firewall baffle is fabricated stainless steel or an integral part of the engine midframe casting, depending upon the engine model.

► **Turbine Assembly**—Turbine unit is a single-stage impulse-type installation consisting of the nozzle diaphragm and wheel and shaft. The hollow turbine shaft is splined at compressor end to fit splines in compressor eleventh stage wheel. Turbine blades, forged heat-resistant alloy, are welded to wheel rim and shrouded to improve vibration resistance. Turbine wheel, forged integral with the shaft to provide maximum strength, is cooled by air extracted from the eighth compressor stage and delivered to both sides of wheel, thus helping to reduce heat conducted along the shaft from the wheel hub into the rear bearing.

Nozzle diaphragm consists of fabricated



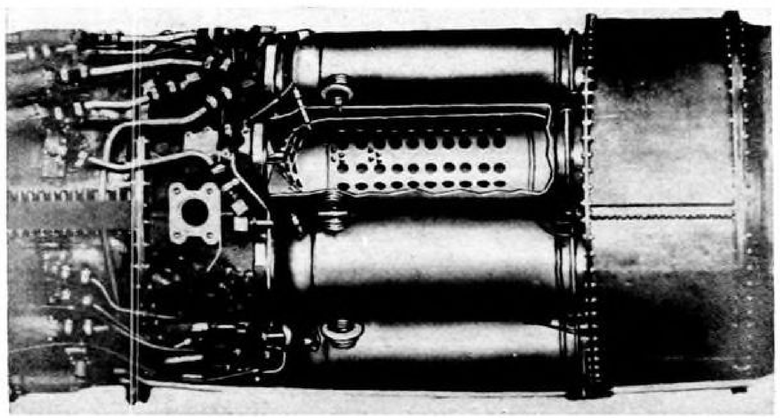
TURBINE ROTOR ASSEMBLY: (1) Turbine wheel, (2) buckets, (3) No. 4 bearing journal, (4) No. 4 bearing, (5) No. 3 bearing journal, (6) No. 3 bearing, (7) turbine shaft, and (8) Main drive spline—fits into compressor rotor hub.



PART-SECTIONAL VIEW of TG-180 turbojet: (1) Accessories, (2) accessory drive gear casing, (3) compressor air inlet, (4) forward frame, (5) compressor rotor, (6) stator, (7) rotor shaft, (8) midframe, (9) fuel nozzle, (10) combustion chamber, (11) combustion liner, (12) aft frame, (13) transition liner, (14) turbine nozzle diaphragm, (15) turbine wheel, (16) outer exhaust cone, (17) inner exhaust cone, (18) support strut, (19) No. 4 bearing, (20) typical oil line and air line supplying No. 4 bearing, (21) burner support plate, (22) No. 3 bearing, (23) cross-ignition tube, (24) ignitor plug, (25) turbine shaft bolt, (26) No. 2 bearing, and (27) No. 1 bearing. No. 2 bearing carries rotor assembly axial thrust; No. 3 bearing acts as vibration damper.

inner and outer spacer bands with punched holes to receive the ends of 64 equally spaced blades to form the nozzles. Blades, fabricated from sheet stock welded to the spacer bands, are not cooled.

Unit is so designed, that after removal of the exhaust cone, the turbine wheel and nozzle diaphragm may be removed for inspection or replacement without complete engine disassembly.



DETAILS OF COMBUSTION CHAMBER INSTALLATION. Clamp rings are visible at extremities of the separate units. Transition liners (not seen) leading from chambers to nozzle diaphragm are housed between bolted circumferential members seen at right.

► **Shaft and Bearing Arrangements**—Main rotor assembly, comprising the compressor and turbine rotors, is fastened rigidly by a spline connection inside the hub of the eleventh stage compressor disk to carry torque; and by a single long bolt, or drawbar, running through the hollow turbine shaft into the compressor eleventh stage wheel hub, to carry the axial load of the turbine wheel into the compressor rotor assembly and main thrust bearing.

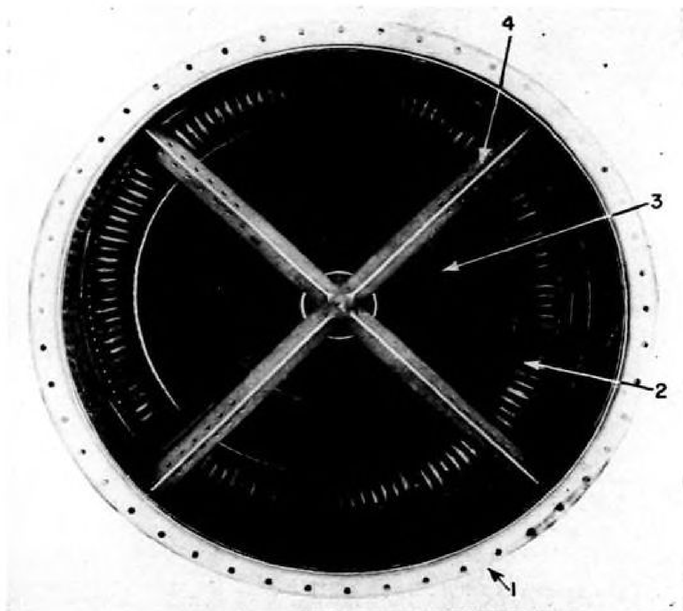
Main engine bearings are all super-precision quality anti-friction units, for low torque and low heat rejection. Front roller (No. 1) bearing is located in the forward frame on the front end of the compressor shaft. Main thrust (No. 2) ball bearing is on the hub of the eleventh stage wheel and carries the axial thrust of the entire rotor assembly. Bearings Nos. 3 and 4 are roller type, mounted on the turbine shaft and located in the aft frame. Bearing No. 3 is a damper unit to prevent excessive shaft vibration.

To balance axial thrust on the rotor, air is extracted from the compressor eighth stage and used to provide a balancing pressure on the face of the first stage wheel.

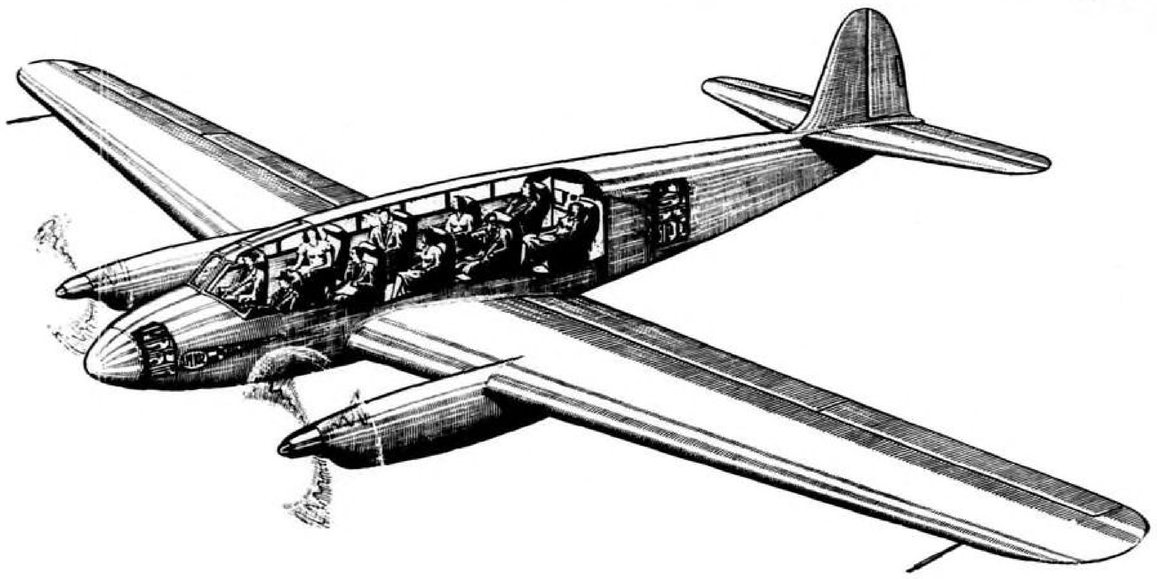
► **Exhaust Cone**—Discharge gases are collected in the exhaust cone, consisting of a stainless steel outer shell and central cone supported from the shell by eight streamlined struts. From the exhaust cone end, gases pass through the exhaust pipe to the exhaust nozzle, restricted to provide high discharge velocity. It is customary to adjust the size of exhaust nozzle to maximum permissible exhaust temperature to utilize maximum thrust obtainable from a given engine.

Length of the exhaust pipe varies with each installation, and may be greater than ten feet.

(Additional details—covering accessories; lubrication, fuel, ignition, and starting systems; engine mounting; and pilot's controls —will be presented in our next issue.)



REAR VIEW OF TG-180: (1) Exhaust flange, (2) turbine buckets, (3) inner exhaust cone, and (4) support struts.



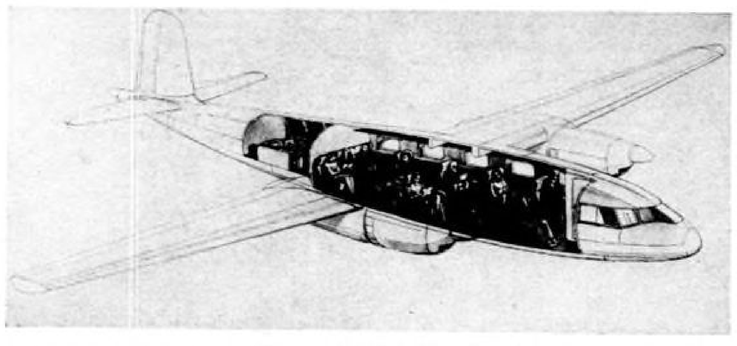
Italians Start Work on Two New Transports

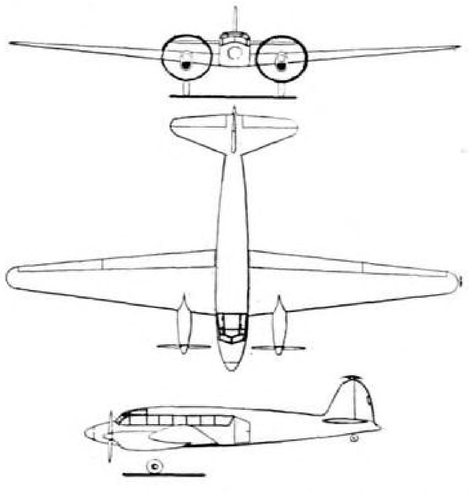
Siai-Marchetti SM-102, of composite construction, built around American engines. Breda-Zappata BZ-309 is all-metal high-wing craft with tricycle gear.

Italian aeronautical engineers today are progressing from the design to limited production stage of new types designed for peacetime operations, according to McGraw-Hill World News reports.

Newest project of Siai-Marchetti is the 8-passenger SM-102, designed for short-haul work within Italy itself. Now in preliminary construction stages, the craft will be of composite construction: a metal fuselage and wood wings comprised of built-up plywood spars and ribs with plywood covering. Powered by two 450-hp. Ranger SGV-770C1B engines, the craft will have gross wt. of 9,700 lb., and empty wt. of 5,700 lb. Wing span is listed as 64 ft., length, 41 ft. and height 10 ft. 6 in.

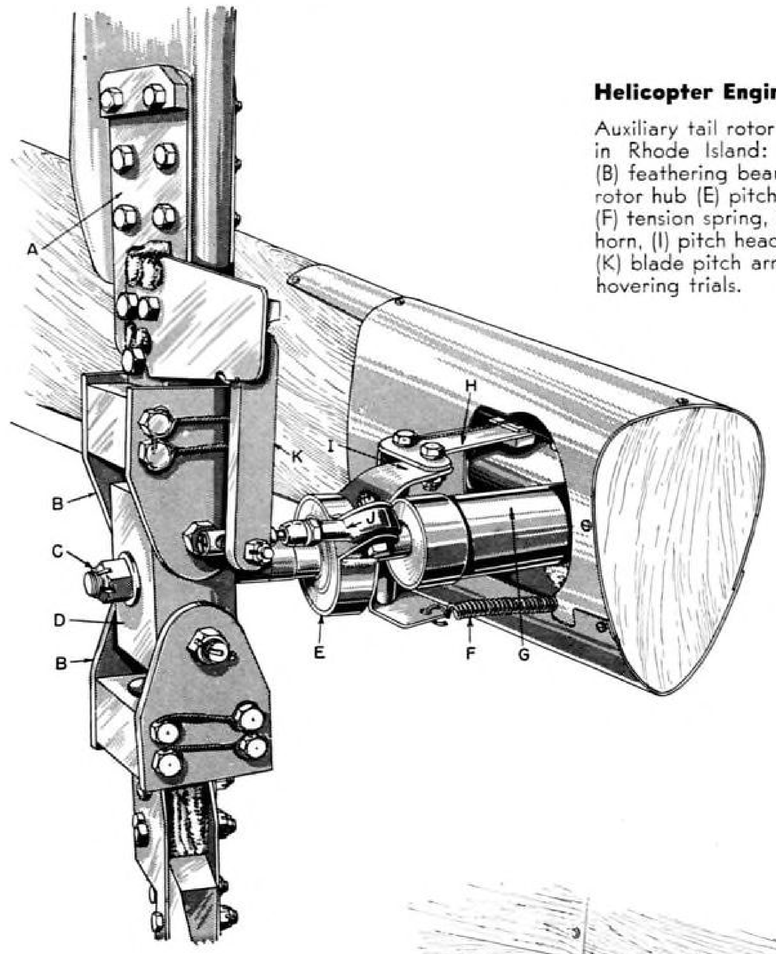
A slightly larger craft, but being built for the same type of operation, is the Breda-Zappata BZ-309, a high-wing all-metal craft designed for eleven passengers and crew of two. To be powered by two 900-hp. inline engines, design cruising speed is listed at 217 mph. Gross wt. is set at 12,125 lb., empty wt. at 8,050 lb., span, 65 ft., length, 48 ft.





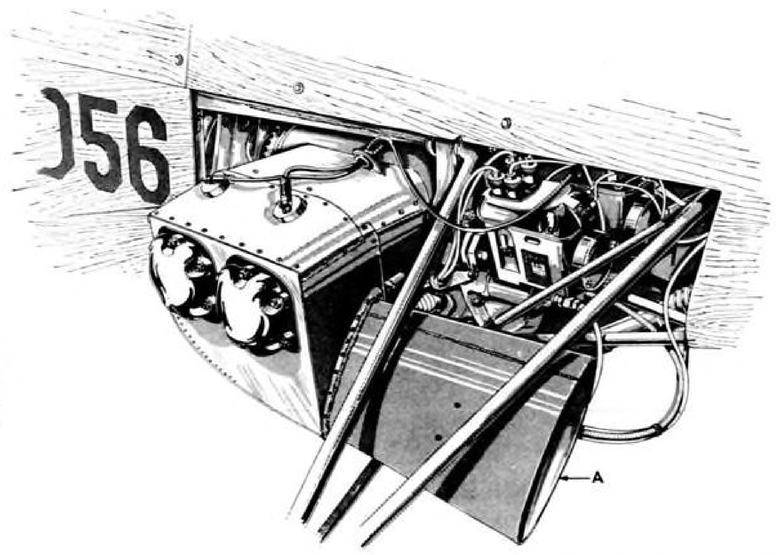
Artist's conception of Breda-Zappata BZ-309 (above), all-metal, high wing transport designed for eleven passengers and crew of two. With retractable tricycle landing gear cruising speed is slated to be 217 mph. Span is 65 ft. and wing area is 395 sq. ft. Siai-Marchetti SM-102 composite construction transport (right and at top) having span of 64 ft., length of 41 ft., and height of 10 ft. 6 in. Wing area is 457 sq. ft. Gross wt. is set at 9,700 lb., empty wt. is 5,700 lb.

Sketchbook of DESIGN DETAIL



Helicopter Engineering & Construction Model 100

Auxiliary tail rotor detail of single-place craft developed in Rhode Island: (A) Blade retainer and root fitting, (B) feathering bearing retainers, (C) hub retainer nut, (D) rotor hub (E) pitch head containing internal ball bearing, (F) tension spring, (G) auxiliary rotor gearbox, (H) control horn, (I) pitch head arm, (J) pitch changing push rod, and (K) blade pitch arm. Craft is now undergoing tied-down hovering trials.



Underside-of-fuselage mounting of craft's 75-hp. Continental and accessories. Engine is fitted with exhaust ejector cooling system, outlet being through duct (A). Note how compactly power plant is cowled. (Also see March, 1947, "Aviation".)

AVIATION SALES & SERVICE

Close-in Airpark Financed By Oklahoma City Businessmen

With investment of approximately $500,000 in the new Oklahoma City Downtown Airpark, financial backers of the new enterprise expect it will amortize the outlay over a period of 15 to 20 yr. Usage of the new field in advance of its formal dedication scheduled for July 4, indicated excellent patronage from both local and transient flyers, due to the field's close-in location.

Situated only 1½ mi. from the heart of the downtown shopping and business district, the airpark was originally planned by city officials as a municipal field. Later the city fathers decided to abandon the project, and a group of Oklahoma City business men, most of them private flyers, put up the funds to insure its completion.

When completed it is expected to be the finest downtown airpark in any city of its size in the country, and one of the few in the close-in category to be privately owned. Its financial success will be watched closely by aviation circles, since it may serve as a model for many other such enterprises.

► **Runways Completed**—The field has a 2,600-ft. north-south runway, and a 2,200-ft. northeast-southwest runway, and can handle planes as large as twin-engine Beechcrafts.

Already completed are individual T-hangar facilities for 35 planes and a large hangar for repair and overhaul shops. Additional hangars to provide space for approximately 100 more planes are scheduled for construction immediately, and when the airpark building program is finally completed there will be accommodations for a total of 200 planes.

A brick administration building now being completed will house a restaurant, pilot's lounge and airport offices.

► **Stock-For-Work**—Hal McKnight, former AAF pilot, is general manager and executive vice-president of the Downtown Airpark Corp., operating company.

Much of the investment thus far has been in the form of services by men or firms who were compensated with stock in the corporation. One did the grading, another provided asphalt for the runways, another provided the land, and still another the architectural and engineering work. Only construction of the administration building and hangars were contracted for outside the members of the corporation.

Sponsors and observers enthusiastically anticipate early and substantial returns from the enterprise. Time and money in the project reflect a civic aviation interest characteristic of Oklahoma City, original site of the National Aviation Clinic, which already enjoys a reputation as a strong supporter of air progress.

Ryan Continues Navion Pricetag

Flyaway figure of $7,750 remains pending production cost analysis.

Current price of the Navion ($7,750 flyaway factory) will be maintained until further notice by Ryan Aeronautical Co., San Diego, which will produce the former North American four-place personal and business plane, T. Claude Ryan, President, informed AVIATION WEEK.

Ryan said a detailed analysis of markets and production costs at the San Diego plant would be made to determine whether the price should be changed. His company has made no agreement with the former owner, North American Aviation, to defer Ryan production until the inventory of flyable Navions at North American is sold, but he expects it will be disposed of by the time his company is ready to start deliveries.

► **Ready by October**—He estimates his company will be tooled up and ready to start Navion production at San Diego by late October or early November.

Ryan said he hoped to take up the Navion sales program where it was discontinued by North American and to use the 17 Navion factory dealers appointed by North American.

The Navion program may constitute the main commercial aircraft planning of Ryan for the immediate future, at least, and is believed to have resulted in shelving several other airplane designs and at least one helicopter.

OKLAHOMA CITY DOWNTOWN AIRPARK—An investment of approximately $500,000 in private capital is being made in Oklahoma City's new Downtown Airpark, 1½ mi. from center of business and shopping districts. Originally projected as a municipal field, airpark was abandoned by city officials, so Oklahoma business men continued development.

copter that Ryan was considering for development. The Navion will be Ryan's ninth commercial aircraft, and his 21st plane, including military projects.

► **Dealer Reaction**—One dealer's reaction was:

"I will not be surprised if Ryan makes some changes in the Navion directed to greater luxury and comfort, and raises the price appreciably. I feel I would not have trouble selling it at $9,000."

President Ryan said he had no basic changes in mind for the Navion design: "Just as it stands, the Navion is the best of the bunch. That's why we took it on."

Neither company would disclose the lock-stock-and-barrel price that bought the Navion.

New Stinson Office To Aid Distributors

Recognizing one of the basic needs in the aircraft sales and service business, Stinson Division of Consolidated Vultee has established a business management office headed by an experienced automotive man who will act as a business consultant and analyst for Stinson distributors and dealers in the U. S. and Canada.

Stinson thus carries one step farther a practice common with many suppliers of emphasizing to distributors and dealers the need for sound business and accounting procedures.

Oil companies, in particular, in recent years have endeavored to assist their dealers in conforming to recognized business procedures

Stinson has appointed Walter A. Simon to head the new office, with the job of working closely with distributors and dealers to organize sales and business management aids.

Before joining Stinson, Simon was business manager for the Detroit zone of Chevrolet Motor Co.

NEW AERONCA LIAISON PLANE

Off-the-shelf purchase of 439 Aeronca lightplanes for liaison plane use by Army Ground Forces has resulted in Aeronca Model 7BC, basically Aeronca Champion tandem trainer with addition of plexiglas cabin top, and replacement of Champion's 65-hp. engine with an 85-hp. Continental with fuel injection carburetion. Aeronca was awarded two-place tandem contract on a bid of $1649 per plane, following competitive tests with other lightplanes at Ft. Bragg, Carolina. Order also includes 30% additional spare parts for replacements.

Continental Offers Dealer Ad Campaign

A local tie-in advertising campaign for dealers and distributors, built around the slogan "Start Flying Now" is being offered by Continental Motors Corp. in conjunction with a series of ads the manufacturer is placing in its own behalf.

Continental is sending material on the promotional campaign to some 8,000 operators, many of whom are company distributors or dealers. But mats of the ads, in a variety of sizes and shapes, are offered free to any operator who will buy space in local papers to run the ads. The ads would carry the dealer's own name, with no mention of Continental unless the sponsor is a Continental dealer.

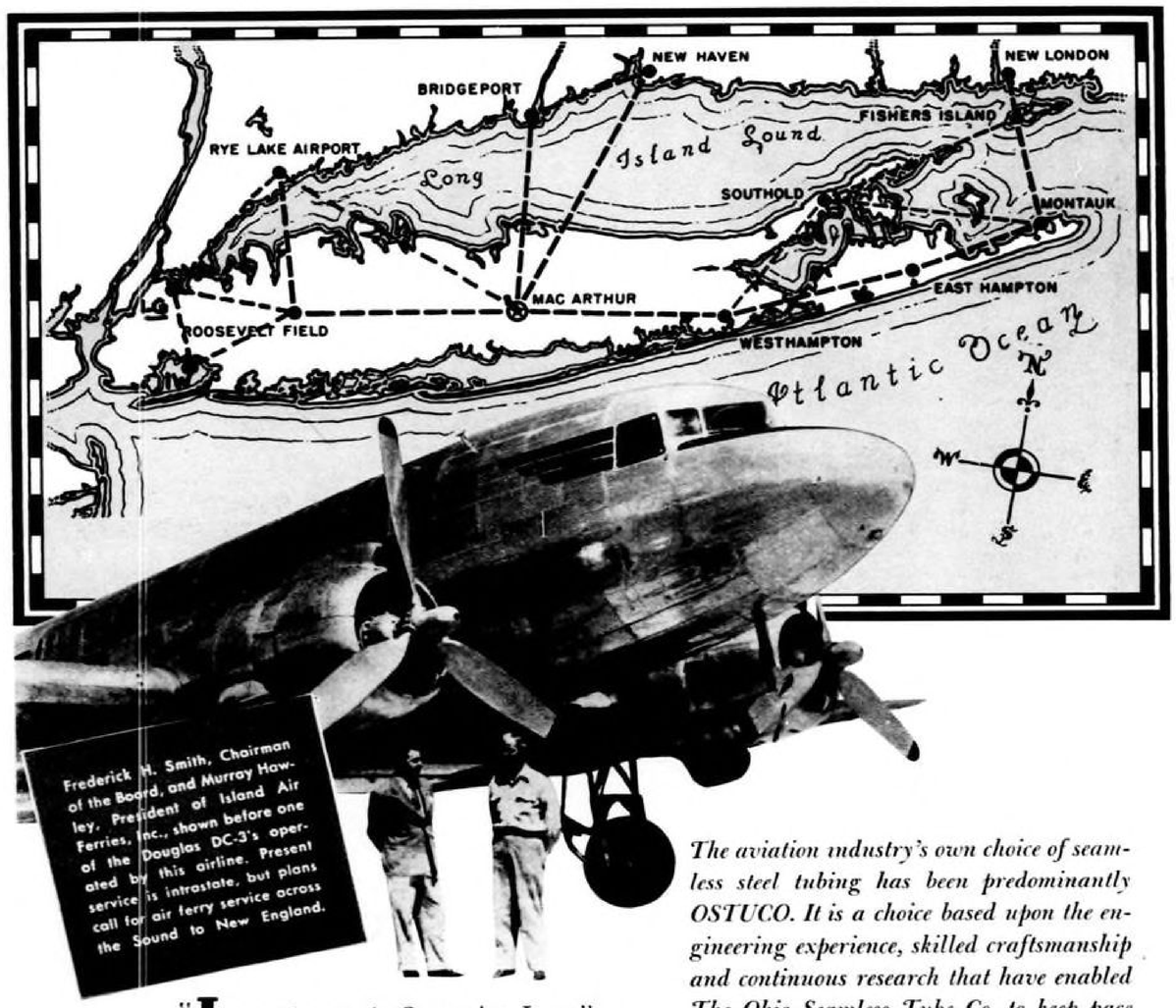
Continental is replacing its competitive type of product advertising with the new campaign with the purpose of selling the public on the advantages of learning to fly. The ads stress the utility of light airplanes, and the "ease, simplicity and low cost" of obtaining a pilot's license. The reader is referred to the local operator for full details.

In explaining the reasoning behind Continental's action, D. H. Hollowell, Vice-President in charge of aircraft engine sales, said the campaign will run for the balance of the year. "Every airport in the country," he said, "has its regular hangers-on-folks who come out day after day to lean on the fence, watch plane take-offs and landings, and wish they could fly. They comprise a preferred prospect group which is well worth tapping. It's a safe assumption that many of them are putting off flying lessons because of misconceptions about the red tape and expense involved."

HELICOPTER CROP DUSTER

Two hoppers of 200-lb. capacity each, on either side of the Bell crop-dusting helicopter, are loaded with DDT-laden dust. Ejector tube through which dust is blown, mixed with air from engine fan, is seen at bottom of hopper. Downwash of helicopter's rotor blades swirls dust onto underside of plant foliage. Helicopter dusts a 60-ft. swath in one trip across a field, and covers between 100 and 200 acres per hr. Helicopter is variation of Bell Model 47, with 178-hp. Franklin.

AIRLINE on an ISLAND



"LONG ISLAND'S OWN AIR LINE" aptly describes Island Air Ferries, Inc. Operating since 1945, the line was established to provide fast transportation of passengers, mail, express and air freight in and out of Long Island.

Future plans call for uniting the highly industrialized New England area with Long Island, a plan that until the advent of air service had been effectively blocked by the presence of Long Island Sound. Many new industries, locating at various points along Island Air Ferries routes, augur well for the future of this "airline on an island."

Goodyear Building 15 Amphibs For Flight Test And Survey

Fifteen Goodyear Aircraft GA-2 Duck three-place amphibians now being completed, are to be sent out for probably the most exhaustive service test ever given to a new personal-type airplane not in production and not offered for sale.

Whether the Akron company will enter the plane in the lightplane market, and go into full scale produciton, has not yet been indicated although the 15 new planes are semi-production articles, following the development of the experimental Duck prototype which received its approved type certificate from CAA several months ago.

Some of the 15 planes will be used by Goodyear sales representatives to demonstrate aviation products of Goodyear Aircraft and the parent company, Goodyear Tire and Rubber Co., such as the castering aircraft wheel for crosswind landings, demonstrated in a production version for the first time on an amphibian at the recent Aviation Country Club lightplane show at Hicksville, L. I. The showing also was the first public demonstration of a retractable castering landing gear.

► **Widespread Flight Tests**—A plan to make other Ducks available to selected aircraft service operators, for normal use in their flying services is being studied by the company and may be announced soon. The plan would spot a number of the planes in different sections of the country for service performance tests in widely different climatic conditions.

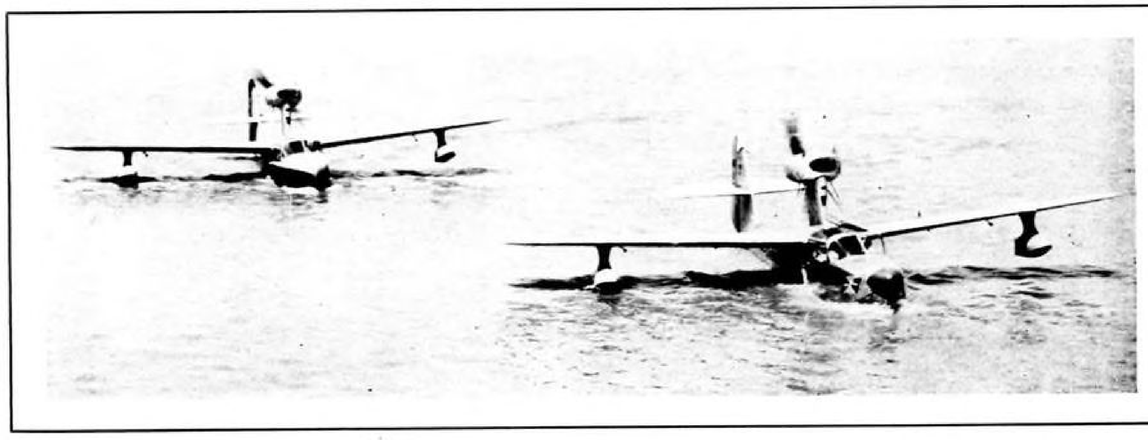
A 145-hp. Franklin engine, mounted as a pusher on a pedestal atop the 36-ft. span wing, powers the plane, which has two side-by-side seats in front and a third behind, with an 11-cu. ft. baggage compartment. Overall length is 26 ft. Plane is credited with cruising speed of 110 mph., top speed of 125 mph. and 50 mph. landing speed on either land or water.

► **Metal Construction**—Duck has all-metal hull, and metal-construction, fabric-covered wings with wingtip slots for maximum aileron control, and all-metal wingtip floats mounted high enough to avoid damage in normal airport taxiing. Landing gear, including tailwheel is fully retractable, with an auxiliary hand crank provided as emergency in event normal electric-powered retraction mechanism should fail. Plane is designed to takeoff from water under normal conditions with 1300 ft. run. Range is approximately 370 mi. with 30 gal. fuel tank. Spin characteristics and recovery are described as normal.

Standard equipment will include tires, single disc brakes, Pliocel fuel tanks, torsion rubber tail wheel assembly, all made by Goodyear; push-button electric starter, water anchor, retractable water rudder, basic instrumentation, two-way radio, map shelf, wheel control, and inflated seat cushion which will serve as life preserver.

FLIGHT CLOSEUP of Goodyear GA-2 Duck amphibian

CASTERING GEAR Duck takeoff in 90-deg. crosswind.



OATA Session Votes Five-point Program

Ohio Aviation Trades Association at its first convention in Bowling Green, Ohio, voted a five-point program for commercial airports and air safety conditions.

Meeting in conjunction with the Second Annual Ohio Aviation Clinic, sponsored by the State Aviation Board, OATA urged the Board to:

- Check plans for new commercial airports.
- Reject such plans if any existing airport is within three miles of a proposed site.
- Approve new airports only when there would be at least one runway not less than 1,800 ft. long with a glide path ratio of 10-to-1.
- Investigate feasibility of prescribing uniform rules for maneuvering aircraft on the ground.
- Require seaplane pilots to have proper CAA certification and to take off and land only in cleared areas where they will not endanger surface craft.

Supporters of aviation were cautioned against trying to "ram things down people's throats" when promoting new airports.

Hugh De Haven, head of the Crash Inquiry Research Institute at Cornell Medical College, New York, reported that amateur flyers could soon expect improved safety belts.

Police officers attending the Clinic's enforcement program were urged to clamp down on violators of the State's new flying regulations after they become effective Aug. 14.

John F. Guilmartin of the Chicago CAA office advised them to concentrate on low and reckless flyers, the most frequent violators.

Michigan Resumes Airmarking Program

Michigan's Department of Aeronautics has set a goal of airmarking 300 towns in the state this summer, and has already completed 25, Walter J. Carr, air navigation specialist of the department, reports.

The 300 towns, when airmarked, plus the 186 communities posted in 1946, will make the state even better marked than it was before the war.

By the time the war emergency made necessary obliteration of airmarkers throughout the country, Michigan had signs on 460 towns.

The signs are yellow, and are painted in letters 10 ft. high on the tops of large, flat buildings.

The state furnishes the paint and has two contractors in the field to do the work. If local groups wish to do the marking, the state supplies the paint and layout.

BRIEFING FOR DEALERS AND DISTRIBUTORS

FREE NAVION RIDES—Navion dealers are advertising to give away free rides, to businessmen who may be potential buyers of the four-place all-metal airplane, which has been adopted by Ryan Aeronautical Corp., San Diego, from the original parent, North American Aviation, Inc. The factory dealer advertising, appearing in hometown papers, offers the businessman a free business trip by Navion to anywhere within 150-mi. radius, and agrees to pick him up in the plane at the airport nearest his home or business. "All we ask in return is a few minutes during the flight to explain how the Navion costs no more than a car to drive, and how businessmen everywhere are finding that this easy-to-fly plane is a money maker for them," the advertisement continues. "We do want you to see for yourself what tremenous strides have been made in private planes since the war." If the advertising develops even a few good prospects, among businessmn who can get real utility out of the four-placers, and if the dealers screen the riders to eliminate those who are quick to try to cash in on such offers, but have no intention or ability to buy, the promotion promises to be well worth while.

DUCK FARMING—Goodyear Aircraft Corp., manufacturer of the three-place duck amphibian, which still isn't sure whether it wants to get its feet wet in the personal plane market or not, is getting about set to farm out a dozen Ducks to aircraft service operators. The idea is to let the operator fly the plane as if it were his own, using it in any type of aviation service he chooses and giving the plane a good general workout. First operator to be selected is due for announcement soon and might have received his plane before now, had it not been for delays caused by the GAC strike .

AERO MEDICAL DIEHARDS—Despite accident records since the liberalization of medical requirements for private pilots, which indicate that the physical examinations have very little if any bearing on the accident record, the Aero-Medical Association of the United States, composed of the physicians who used to make virtually all pilot examinations before the liberalization, is still blasting at CAA for letting down the barriers and making it possible for the less-than-perfect man to fly. In contrast, the non-Scheduled Flying Advisory Committee for CAA has recommended, and it is probable that CAA will soon adopt the practice of requiring only one physical exam for the student pilot, with no further examinations required, ever, at any time. Accident statistics indicate that the "hot pilots" who fly low and stunt, and the careless pilots who let themselves get caught in bad weather, cause many more accidents than any physical ailments or handicaps. In fact the physically handicapped pilots in most cases are among the safest, because they are naturally cautious, and because they usually have spent more time and effort in learning to fly.

BRITISH DISCOVER THE ERCOUPE—Recent issues of British aviation magazines indicate that our cousins have at long last discovered Fred Weick's excellent two-control spin-proof airplane, which after nearly two years of postwar production, is still the only airplane we know being marketed which can be soloed in four hours. The ecstatic writing of Stanley Bradshaw, in a recent issue of *Aeroplane* recalls some of that first glow which surrounded the Ercoupe in this country in its prewar era, but which has since, and for no good reason, been too much forgotten. The Briton extols the Ercoupe's taxiing performance which he says "would have turned a London taxidriver every shade of green, with envy". He is quite wide-eyed about the plane's ability "to crawl around in a turn with the nose to the sky, one wing well down, the wheel hard back, and the airspeed indicator fluttering only a little above the 40-mph. mark." After flying the plane himself, and finding the two-control system comes quite naturally, he concludes: "We need as much inherent foolproofness as can be built into the personal planes of today and tomorrow. When it can be achieved, as in the Ercoupe with so little sacrifice, if any, of normal handling characteristics, and so cheaply, then there is no excuse for this dogged pursuit of the old ways!"

KLENKE FORECAST—Bill Klenke, Stinson sales manager, predicts that personal plane business will taper off again this fall and winter after a good summer of sales much as the personal plane market reacted last year. So Stinson is planning to begin tapernig off production in July in line with this expectation, but will strengthen its retail sales organization in preparation for another seasonal upturn next spring. The Wayne, Mich., division of Consolidated Vultee Corp., for the first time in its 21 yr. now has over 300 retail sales and service outlets, which have sold more planes in the last six months than in any similar period in Stinson history, he reports. After a national tour of Stinson dealers, Klenke finds that they have in stock an average of less than one new plane to a dealer, but he predicts "difficult conditions" in the next few months for manufacturers and dealers who are overloaded on new plane inventory and short on working capital.

AIRPORT TITLE SUIT—Suit to acquire title to a privately operated airport, filed by the Minneapolis-St.-Paul Metropolitan Airports Commission, may be, as the commission says, to take over the airport and improve it in the public interest. But it is the kind of thing that airport service operators who believe in free and independent enterprises—and who object to government competition with private business—should watch very closely. If a municipality or its commission can take over any private airport, by a simple procedure of filing suit to claim it and paying off an appraised valuation, if offers a new opportunity for political grabbing. Probably the best way for the operators to handle such matters, or any other on a state or local government level, is by forming an aggressive and loudly vocal operators' organization which will investigate such actions and make its united influence felt in the interests of progress in aviation.

Alexander McSurely

FINANCIAL

Current Airline Merger Talks Unlikely to Result in Action

Analysis of Requirements Indicates Proposals Under Discussion Fall Short of Consolidation Qualifications.

Considerable speculation continues to shroud a number of airline merger discussions. It is known that exploratory talks have been going on between top airline executives and bankers. Presumably, Civil Aeronautics Board and other government officials have been apprised of tentative proposals. It is known, for example, that Chairman Landis is in favor of a number of airline mergers. The type of consolidation likely to receive Board sanction, however, is not of the variety that has been proposed thus far by the industry.

Current merger discussions are a normal outgrowth of a desire to correct many of the financial ailments plaguing the air carriers. Some observers maintain that if a weak carrier is combined with a strong one, greater stability of earnings will be introduced in the industry. The list of likely candidates to be consolidated with other lines includes Northeast, PCA, Colonial and Chicago & Southern. These carriers have experienced considerable difficulty in developing sustained earning power. Mid-Continent and Continental continue in their attempts to broaden their operations by acquisition of other properties. This entire group, interestingly enough, is in the "need" mail category. Expressing polite interest in absorbing other carriers are some of the larger lines including Braniff and National. It is conceivable that in any broad re-shuffling of airline properties, the trunk lines—Eastern, American, United and TWA—would become active participants in any consolidation moves.

▶ **Merger Talk Discounted**—Despite preliminary discussions and the obvious need for corrective action, the current wave of merger rumors may be largely dissipated long before it reaches the stage of seeking Board approval. Numerous mergers previously have been actively considered and a few have gone into the procedural mill of the Board. Thus far, the Board and its predecessor, the Civil Aeronautics Authority, have approved only two mergers or acquisition since 1938. This was the acquisition of Inland Air Lines by Western Air Lines and TWA's absorption of Marquette.

Prime requisite in the consolidation of air carriers is the strong community of interest and a definite logical route pattern. This obviously was present in the two instances named. The Inland properties may now be due for another change and may represent the only significant airline acquisition developing out of current proposals likely of consummation. Industry observers are awaiting outcome of the Board's decision in passing upon the proposed purchase of the Denver-Los Angeles route by United from Western. If approved, this should be the signal for the sale of the Inland Division to another carrier. Under the new regional concept now being pursued by Western, confining its operations west of the Rockies, the Inland routes would no longer fit into the pattern. Continental, Mid-Continent, United and Northwest may be expected to become very much interested in the disposition of the Inland routes.

▶ **Requisites**—The desired attributes are not always present in proposed airline consolidations. For example, the American Mid-Continent merger was turned down by the Board as it would merely add to the former's bigness and there was no demonstrated community of interest. The proposed PCA-Northeast merger was withdrawn voluntarily after it was well along in the Board's procedural mill. The announced reason for dropping this proposal was attributed to the deteriorating financial condition of both carriers. However, if the proposal was sound in the first instance, here was an opportunity to place in effect the benefits originally claimed and thus introduce earning power stability to the combined system.

One of the greatest stumbling blocks to airline mergers always has been the strong individual personalities at the head of the respective lines. The question of who would emerge as the dominant force in any new combine has never been quite solved. It is possible, however, that economic forces may force a number of involuntary adjustments.

▶ **Financial Considerations**—One of the main benefits ascribed to larger corporate organizations and thus a factor in favor of fewer individual airlines is the increased financial stature. Credit can be obtained and securities can be sold with greater ease and at lower cost by a large organization than by a small company with limited resources. Administrative and other overhead burdens can be spread over a broader base and volume of business. Economies of larger purchases can be effected. Increased economies of operation become possible through a host of avenues.

The same factors that appear to favor general corporate enterprises pertaining to relative size, however, may not operate always in the air transport industry. For example, assuming a proposal for combining Eastern and Northeast was advanced. If this was approved, Northeast's mail compensation, which currently approximates $15.50 per ton mile, would no longer prevail but would be consolidated in Eastern's system-wide rate of 45 cents a ton mile. Another factor constantly stressed in advocating mergers is the desirability of giving a carrier a longer haul. It is quite true that this is a very important element but far from controlling. For instance, TWA has the longest average passenger haul and PCA the shortest, yet both carriers are high-cost operators.

▶ **Earnings Level Important**—The coming level of earnings this fall may exert considerable pressure toward more logical consolidation patterns. This can take force through dual circumstances. A weak airline on the verge of going under will have to submerge its personalities, thus removing one of the previously existing type of obstacles. Further, a strong carrier, eyeing the acquisition of an airline going through rough financial weather, obviously sees an opportunity to reduce the purchase price by patient waiting.

Despite the character and type of mergers that may be advanced later this year, it will be well to refrain from any conclusions until the CAB officially passes its approval. Much can happen in the interim. It will be recalled that during the American Mid-Continent and PCA-Northeast merger stages, talk was rife that the Board would apprave such proposals without delay. Investment house analyses made bland assumptions as if these consolidations were an accomplished fact. Further, the PCA-Northeast combination was even recommended for approval by a Board examiner, but never materialized. Moreover, even if approved, the terms of the exchange of securities or purchase price are subject to adjustment by the Board.—**Selig Altschul.**

West Coast Strike Threats Receding

West Coast industry-wide strike threats weakened materially when Douglas, North American and Northrop fell into line with the wage raise pattern set by Lockheed at the start of the month.

The three Los Angeles major employers offered 5-cent per hour raises to hourly workers and comparable inceases to salaried employees.

There could be little doubt that (with the exception of Northrop, which was not confronted with a walkout threat) they felt they had been forced by the Lockheed wage boost to abandon earlier plans to permit strikes rather than yield to union wage demands.

Douglas unionists accepted the nickel raise offer, and the company's resultant wage increase order will benefit the majority of 15,000 employes at Santa Monica, 6,000 at El Segundo, and 2,000 at Long Beach plants.

North American's CIO union at mid-week was "considering" the wage offer for its several thousand members while the balance of the Company's 13,691 employees were given salary increases.

AIR TRANSPORT

Domestic, Trans-Atlantic Carriers Show First 1947 Operating Profit

Industry's improved earnings during April make only small dent in huge deficit for first quarter; Eastern continues to set pace.

By CHARLES ADAMS

With Eastern Air Lines continuing to furnish most of the power, the domestic air transport industry during April pulled out of the financial woods for the first time this year.

Nine of the 16 scheduled airlines continued their first three months' losses into the second quarter. But overall operating profit for the industry, bolstered by Eastern's impressive $1,306,964 income, was $393,315.

► **Small Dent**—The improved showing in April makes only a small dent in the whopping $18,746,182 operating deficit during the first quarter. Moreover, the April profit of $393,315 was still substantially behind the same 1946 month, when the same carriers earned around $470,000. Cumulative first four months figures show the domestic airlines with an $18,352,867 operating deficit in 1947 compared with a $4,026,755 loss in the same 1946 period.

U. S. flag carriers on the trans-Atlantic run shared in the April financial gains. Balancing American Overseas Airlines' $304,666 operating loss were a $385,289 operating profit by Pan American Airways' Atlantic Division and an $88,338 profit by TWA.

► **Feeders Gain**—The six feeders active during April pared their losses from the high level of the first three months, but with the exception of Pioneer Air Lines remained in the red. Pioneer earned $28,352 on operations in April, largely because of a recent CAB order which gave the carrier 60 cents a plane mile mail compensation for the period September, 1946, through May, 1947. Other feeders' mail pay is still at the 35 cents a plane mile temporary rate.

Adjustments in mail compensation have resulted in a gradual trimming of air carrier losses from original figures issued by CAB for 1946 and undoubtedly will shave the 1947 losses similarly. Example of a complete reversal in a company's financial position was seen last year when Northeast Airlines finished 11 months with a $254,000 net loss that changed into a 12-month operating profit of $190,707 following a retroactive mail pay boost.

► **Western, PCA Profit**—Mail pay adjustments this spring have resulted in the rather unusual position of Western Air Lines and Capital Airlines (PCA), two of the high-deficit carriers last winter, in the profit column this spring. PCA reported $48,003 operating income in April and $89,789 operating income in May against a first quarter loss of $2,215,000. Western earned $31,886 in April against $668,000 operating loss for the first quarter.

Other April operating results, with first quarter figures in parentheses, are:

American, $75,690 profit ($4,684,686 loss); Braniff, $51,742 loss ($582,744 loss); Chicago & Southern, $28,044 loss ($523,700 loss); Colonial, $73,250 loss ($411,314 loss); Continental, $29,744 loss ($257,506 loss); Delta, $149,200 profit ($279,807 loss); Eastern, $1,306,964 profit ($1,664,898 profit); Inland, $4,884 profit ($66,963 loss); Mid-Continent, $32,119 loss ($99,906 loss); National, $98,835 profit ($347,584 profit); Northeast, $84,618 loss ($499,860 loss); Northwest, $324,727 loss ($1,898,490 loss); TWA, $384,329 loss ($3,437,791 loss); and United, $313,574 loss ($5,131,595 loss).

AOA Leads Field On Atlantic Run

American Overseas Airlines, in marking the fifth anniversary of its trans-Atlantic service, has claimed pre-eminence among the eight carriers flying the U.S.-Europe run.

The carrier reports operating more trans-Atlantic flights and furnishing more seats for Europe-bound passengers than its five foreign-flag competitors combined (Air France, KLM, BOAC, SABENA and Scandinavian Airlines). American Overseas states that it is providing approximately 32 percent of the seats offered by all trans-Atlantic carriers, U. S. and foreign.

► **24 Roundtrips**—Under its present schedule, AOA operates 24 round-trips weekly to Europe, compared with a combined total of 20 roundtrips offered by foreign-flag airlines. Other American carriers fly 32 round-trips weekly, making an overall total of 76 roundtrip flights, or 2,657 seats each way, between the U. S. and Europe.

In contrast to the pair of Vought-Sikorsky flying boats with which operations to Foynes, Eire, were begun June 20, 1942, AOA now uses 10 DC-4s and seven Constellations. Eight Boeing Stratocruisers are to go into service early next year. Employment has grown from 336 in 1942 to 3,685 today, including 1,437 stationed abroad.

During the last five years, American Overseas has flown 68,275 passengers 331,250,000 passenger miles. It has carried nearly 2,000,000 lb. of cargo and 2,337,500 lb. of mail between the U. S. and Europe.

► **Record Business**—AOA handled a record of 844 eastbound passengers during the first week of June, achieving a 99 percent load factor. Last minute cancellations prevented filling 10 seats. Westbound traffic was approximately as heavy. The carrier reports that it has received sufficient advance reservations to assure capacity loads for almost every trans-Atlantic flight between now and October.

PAA Again Protests Atlantic Route Pattern

Pan American Airways has extended its series of protests against the existing allocation of U. S. flag air routes to Europe with a new request that CAB modify its North Atlantic case decision of June, 1945. The carrier, in asking for a certificate amendment authorizing service to Paris and Rome, said there is now ample experience to show that the pattern set up in the North Atlantic opinion should be changed.

TWA has a "practical monopoly" in France and Italy as far as American flag competition is concerned," PAA declared, adding that by virtue of its favored position, TWA was able to secure 3,010 eastbound trans-Atlantic passengers and 254,000 lb. of eastbound mail between Jan. 1 and Apr. 13, 1947, against 1,798 eastbound passengers and 145,000 lb. of eastbound mail for PAA. Citing large westbound passenger backlogs at Paris and Rome during the winter, Pan American said TWA had been unable to handle the volume of traffic available to it in its "monopoly territory."

PAA noted that because of the lack of landing rights in the Balkans it was obliged to fly from London over France and Italy to Istanbul, Turkey, without a traffic stop. The carrier proposed that in exchange for authority to serve Paris and Rome for three years on the London-Istanbul link its operations beyond Lisbon on the New York-Lisbon-Barcelona-Marseilles route be suspended.

Robinson to Argue Regional Airline Concept Before CAB

New York intrastate carrier points to high traffic generation from small cities; Sees better, cheaper service than feeders can provide.

A two and a half year struggle for certification by one of the Nation's few year-around intrastate carriers enters its last stages this week when Robinson Airlines, Ithaca, N. Y., appears before CAB in oral argument on the Middle Atlantic area case.

Now boasting the highest traffic volume and load factors since starting flights in April, 1945, Robinson will try to convince the Board that its unique "regional" service will generate more business at less cost than any other non-trunkline type operation. The carrier contends that its own experience has shown that small cities are able to support a line that provides frequent nonstop, high-speed service to surrounding metropolitan areas, but that the same communities can furnish little traffic for the infrequent local schedules of the trunklines or the comparatively slow, grasshopper-like feeder operations.

► **Cities Form Hub**—Robinson uses Ithaca and the nearby triple cities (Binghamton, Endicott and Johnson City) as a hub. This hub area is linked to the three metropolitan centers with which it has the greatest community of interest—Albany, New York and Buffalo.

After dropping to a low of 38.8 percent last January, Robinson boosted its load factor to 61.7 percent in April. May load factor rose to 66.2 percent, and the preliminary figure for the first half of June was 68 percent.

► **Traffic High**—By contrast, the six certificated feederlines operating during April showed load factors ranging from 14 percent to 48 percent. Robinson's revenue passenger miles for April—315,007—were exceeded by only two of the certificated feeders, Pioneer and Southwest.

During May, Robinson's four nine-place Beech D-18S transports carried a record 2,096 revenue passengers 342,252 revenue passenger miles. Eighty-six percent of the scheduled mileage was completed.

► **Ithaca Results**—To support its contention that a regional airline can tap the full traffic potential of small cities, Robinson points to its experience in Ithaca, a community of 20,000 plus 10,000 Cornell University students. More than 50 percent of the airline's traffic originates or terminates at Ithaca, with weekly passengers recently averaging about 260 and reaching a peak of more than 300.

The remaining traffic, with few exceptions, originates or terminates in the triple cities, which have a combined population of about 115,000. Only an occasional rider passes through the Ithaca-triple city hub enroute between New York and Buffalo or New York and Albany since this service is furnished by the trunklines.

► **Deficit Persists**—President C. S. Robinson frankly admits his carrier is not making money despite the impressive load factors and an 8-cents-a-plane-mile passenger fare, somewhat higher than the feeders charge. However, he asserts positively that the company could make money as a certificated operator if granted the same mail pay of 35 cents a plane mile which the feeders are being paid now and consider inadequate.

Without mail pay, Robinson believes an 80 percent load factor will be necessary to break even with D-18S equipment. Certification would also permit carriage of passengers and cargo originating in or destined for other states. Robinson must now refuse this business.

► **Costs Given**—Total operating costs with the Beechcraft have been running around 45 cents a plane mile, according to Robinson. The airline employs 66 persons, a ratio of 16.5 per operating plane, and has an organized traffic and public relations department, station personnel, porters, limousine drivers, an accounting department and a company engineer.

Operations department consists of 14 captains and co-pilots, plus two reserve captains holding other positions in the company. A flight dispatching section at Ithaca is headed by a licensed meteorologist and dispatcher maintaining weather teletypes and two-way VHF radio contact.

► **Low Utilization**—The flying day runs from 7 AM. to 8 PM. Three maintenance shifts are required, with the majority of work being done at night. The carrier's shops handle all but major engine overhauls.

Robinson says the low ratio of employes to planes more than offsets the low ratio (by trunkline standards) of aircraft utilization, which now exceeds 6.5 hours daily. Somewhat lower plane utilization than that of the trunklines is inherent in the regional concept, which involves peak traffic loads during the morning and evening.

► **Surface Competition**—Although charging 8 cents a mile, Robinson's fares are reasonably close to those for railroad pullman transportation. Because of mountainous terrain, railroad distance between New York and Ithaca is 320 miles against 170 miles by plane. Buffalo, New York and Albany—all within 90 minutes of Ithaca and the triple cities by Robinson Airlines—are up to seven hours away by surface transportation.

► **Frequent Schedules**—Robinson offers Ithaca and the triple cities four roundtrip flights daily to New York, and two roundtrips daily to Albany and Buffalo. An extra flight to New York is made on Fridays and Sundays.

► **Terminal Shift**—At present, Robinson uses Roosevelt Field as its New York terminal, but it plans to shift to the Teterboro, N. J., airport if certificated. By the middle of September, the carrier hopes to have its own airport—with two 3,800-ft. runways—completed on a site four miles from the heart of Ithaca.

The carrier's certificate application, filed in 1944, contemplates nonstop service from the Ithaca area to Rochester and Washington, D. C., in addition to the cities now being served.

Airline Passenger Traffic Up 16 Percent

Scheduled carriers, including feeders, report 720 planes in use; cargo volume rises.

Airline passenger traffic during the first four months of 1947 ran about 16 percent higher than the record-breaking levels of the corresponding period in 1946, but the gains have continued to lag behind the 25-50 percent increases forecast by industry traffic officials last Deember.

Revenue passenger mileage reached 1,781,109,000 in the first third of 1947 compared to 1,531,784,115 for the same period last year, the Air Transport Association reports. All other traffic categories except air mail showed marked gains in spite of weather conditions described as the worst in air transport history.

► **Cargo Gains**—Airfreight jumped 294 percent to 8,356,011 ton miles from 2,119,135 in the first four months of 1946. Air express increased 57.5 percent to 9,295,403 ton miles from 5,901,437, while revenue plane miles flown rose 11.4 percent to 99,359,208 from 89,159,214.

At the end of April there were 171 more aircraft in scheduled domestic service than a year ago, ATA said, and available seat miles for the first four months were up 52 percent.

Following a record 250-plane increase in 1946, 29 aircraft were added during the first third of 1947. In May, 27 more planes, mostly DC-6s and Constellations, were acquired, bringing the total fleet of the scheduled airlines to 720.

► **Feeders Included**—Included in the equipment total are 40 planes operated by feeders and All American Aviation on its pickup route. As of June 1, Pioneer Air Lines was using six planes; Southwest, nine; Challenger, three; Empire, four; Florida, three; Monarch, four; West Coast, two; and All American, nine. Traffic figures also cover feeder operations.

The increased seat capacity on the scheduled airlines, which resulted in the dropping of passenger load factors to a post-war low of 58.8 in February, began to fill up late in March. April load factor was 72.8.

Northrop Reconsiders Pioneer Plane Project

Further development hinges on TACA refinancing, former Northrop official says.

Whether Northrop Aircraft will go ahead with development of its three-engine Pioneer rests largely upon whether TACA Airways, principal potential customer, is able to obtain refinancing, it has been indicated by LaMotte T. Cohu, former Northrop General Manager now President of TWA.

In testimony before CAB on his position as a director of both Northrop and TWA, Cohu disclosed that the manufacturer is not now building any more Pioneers and that the project may be abandoned. After stating that TACA was interested in buying, but didn't have the money, he added, "If TACA gets refinanced, I think Northrop will carry on the investment. If it doesn't, they probably will abandon the plane."

► **Changes Being Made**—The company still is not satisfied with the prototype of the plane especially designed for needs such as TACA's in getting in and out of small, rough primitive landing areas, Cohu disclosed. The tail of the airplane and the wings are being changed.

Despite the fact that the Pioneer was conceived primarily for foreign use, some interest in it has developed as a possible feedliner for U. S. use. Commenting on this, Cohu said "If you were going to design an airplane for feeder use in this country I think you could design a better one than the Pioneer. But it does appear to be as good or better than anything that is available at the present time."

► **Turbine Engine Work**—Cohu also gave an insight into Northrop's work on aircraft gas turbine engines, which it has been carrying on jointly with Joshua Hendy Iron Works through Northrop-Hendy Co. Four engines have been built, two of which have "blown up in tests." Northrop has high hopes for the future of its jet engines, with its turboprop developing 9,000 hp.

The company has no present plans for developing a commercial version of its big XB-35 flying wing bomber, Cohu disclosed. He estimated it would cost about $10,000,000 to make it commercially usable.

Competition Study Set

Harvard University School of Business Administration will make a study on "Competition in Air Transportation" under direction of Prof. George P. Baker, former member of CAB. F. W. Gill, formerly with American Airlines, will head the project's staff and will be assisted by Gilbert L. Bates, formerly with PCA, and Sam F. Stone, formerly with Pan American Airways.

Mountain Leaves TWA for I T & T

Joseph D. Mountain, TWA captain and former AAF colonel who for the past year has headed the airline's all-weather flying committee, has resigned to become special assistant to the vice-president of International Standard Electric Co., an International Telephone & Telegraph Corp. subsidiary.

In his new post, Mountain will supervise the development, manufacture and exploitation of automatic reservations equipment and similar devices. He also will supervise all flying activities of I. T. & T. and its associated companies.

Work originally carried on by TWA's all-weather committee henceforth will be coordinated by the carrier's Director of Operations Engineering, J. E. Harrington, in conjunction with the operations departments of the airline's transcontinental and international divisions.

Other personnel developments:

▶ **American**—Has appointed G. J. Brandewiede to head its new Materials Department and has named **John G.** Deater as Company Personnel Director. Former Director of Sales for Curtiss-Wright Corp., Brandewiede will have control of materials purchasing, warehousing, inventory control and surplus sales. Deater replaces Louis A. Traxel, who resigned.

▶ **American Overseas**—Kenneth Murdoch, assistant secretary, has been appointed Director of Planning to succeed H. Danforth Starr, who recently was elected secretary-treasurer. Murdoch will continue as assistant secretary. Thomas O. English and Grant Titsworth have been elected assistant treasurer and assistant secretary, respectively. Thomas J. Harris, formerly American Airlines' New York cargo sales manager, has been named European cargo sales manager for AOA.

▶ **Eastern**—Malcolm F. Plaeger, formerly station manager at Corpus Christi, Tex., has been appointed station manager at Birmingham, Ala.

▶ **Mid-Continent**—W. C. England, for the last year assistant to the director of public relations, has been named district traffic manager at New Orleans.

UAL Eyes Faster Coast-Coast Run

United Air Lines will go into direct competition with American and TWA between New York and Los Angeles July 14 when it inaugurates new one-stop DC-6 service between the East Coast and So. California.

Preliminary schedules filed with CAB indicate that UAL will try to better both American's and TWA's time on the eastbound run. All-daylight service is planned initially, with flights leaving westbound from New York at noon and eastbound from Los Angeles at 8:25 A.M. Only intermediate stop is Chicago.

Prior to a CAB decision May 19 consolidating the Carrier's transcontinental AM 1 with its West Coast route, AM 11, all of United's transcontinental traffic originating or terminating at Los Angeles had to stop at San Francisco or go via Western Air Lines' cutoff. The routing via San Francisco is 450 miles longer than the new direct New York-Chicago-Los Angeles link.

United was slated to start DC-6 service from Washington to San Francisco via Chicago last week.

Other new services:

▶ **BOAC**—Opened a new weekly service between Poole, England, and Hong Kong via Cairo, Bahrein, Karachi, Calcutta and Bangkok recently with 22-passenger Plymouth flying boats. The operation supplements a weekly schedule conducted with Hythe flying boats. BOAC plans to replace all Hythes now in service on its Far Eastern routes with the new two-deck, 28-ton Plymouths, nine have been ordered.

▶ **TWA**—Was slated to start Constellation service into Cincinnati last week. First nonstop New York-Cincinnati flights were to begin at the same time. Carrier intends to inaugurate service to Wilmington, Del., and Allentown-Bethlehem, Pa., around Aug. 1 and to Valle Airport, Ariz., in the Grand Canyon area, this week.

▶ **American**—Started nonstop DC-6 service between New York and Cincinnati early this month.

▶ **Northwest**—Was to begin serving Eau Claire, Wis., last week.

Colonial Again Loses Bid For Latin America

Colonial Airlines has lost again in its bid for a route to Latin America. CAB has denied the carrier's petition for reconsideration of a Board decision in May (AVIATION NEWS, June 2) which failed to authorize one-carrier service from large East Coast cities to the Canal Zone.

The May opinion had reaffirmed the stand taken by the Board a year ago in the Latin American case, when applications of Colonial, Eastern and National for through service between points in Eastern U. S. and Balboa, C. Z., via the West Indies were turned down. Colonial was encouraged to file the petition for reconsideration of the May decision by CAB Member Josh Lee's dissent urging that the carrier be given a route from the co-terminals New York-Washington-Philadelphia-Norfolk to Balboa via Charleston, Nassau, Camaguey, Kingston and Barranquilla.

Philippine Air Lines Gets Route to San Francisco

Philippine Air Lines has been granted CAB authorization to operate between Manila and San Francisco via Honolulu. In issuing the foreign air carrier permit, the board noted that PAL had been designated for the service by the Philippine government, with which the U. S. signed a bilateral air transport agreement last November.

PAL has been flying the trans-Pacific run under contract since last July, using DC-4s supplied and manned by Transocean Air Lines. The Philippine carrier recently purchased Far Eastern Air Transport (Aviation News, June 9) and intends to place DC-6s in trans-Pacific service this fall.

In addition to its U. S. operation, PAL flies Inter-Island in the Philippines and to China, Singapore and Bangkok.

Insurance Paid

Twenty-eight airline trip insurance policies totaling $285,000 were purchased by passengers aboard the United Air Lines, Eastern Air Lines and Capital Airlines DC-4s which crashed in May and June.

Associated Aviation Underwriters, New York, which sells a $5,000 round-trip policy for 25 cents at all airline counters, reports it has already paid most of the beneficiaries.

POA-Siam Starts Service

Pacific Overseas Airlines-Siam has started DC-4 flights between Bangkok, Shanghai, Manila and the West Coast. Until a foreign air carrier permit is granted by CAB, the company will operate on an irregular basis, using American crews under a contract with Pacific Overseas Airlines, Ontario, Cal.

Aleutian Route Urged

CAB examiners have urged the Board to grant Reeve Airways, Anchorage, Alaska, a five-year certificate to carry persons, property and mail between Anchorage and Attu Island in the Aleutians via Cold Bay, Dutch Harbor, Umnak Island, Atka Island, Amchitka Island and Shemya Island. Irregular service to the Pribilof Islands was recommended.

Shortlines

► **Air France**—Marked the first anniversary of its New York-Paris service by increasing trans-Atlantic schedules from four to five weekly. Daily service is planned before the end of summer. Carrier is booked almost solid through July and part of August.

► **American Overseas**—Has inaugurated weekly trans-Atlantic all-cargo service with DC-4s.

► **Capital**—Increased its passenger revenue from a low of $684,000 in January to $1,341,000 in April and $1,571,000 in May.

► **Colonial**—Has appointed F. D. Benham and Larry Nixon as public relations counsel.

► **Linea Aeropostal Venezolana**—Is standardizing on Constellation equipment for overseas operations following the sale of its two remaining C-54s to Colonial Airlines for use on the latter's Bermuda run. As part of the transaction, LAV took two of Colonial's DC-3s and will use them on domestic Venezuelan routes. LAV now has two Constellations operating between Caracas, Havana and New York, and two more Connies are on order for late summer delivery.

► **Northwest**—Around Sept. 1 will move its western region offices from Boeing Field, Seattle, to the new Seattle-Tacoma Airport, where the company is completing a $1,213,000 hangar.

► **Pan American**—Has announced new quantity air express rates providing reductions up to 50 percent throughout the Alaska region.

► **Scandinavian Airlines System**—Has received Uruguayan authorization to establish a commercial service between Sweden and Uruguay.

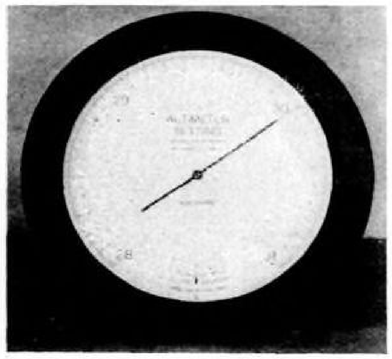
CAB SCHEDULE

July 7. Oral argument in Middle Atlantic States Area Case. (Docket 674 et al.)
July 7. Prehearing conference on Pan American's Latin American Route Consolidation Request. (Docket 2811.)
July 10. Prehearing Conference on TWA's AM 2 and AM 58 Route Consolidation Request. (Docket 2581.)
July 16. Prehearing conference on Resort Airlines' "All Expense Tour" Certificate Application. (Dockets 2377 and 2571.)
July 21. Hearing in All American Aviation's Mail Rate Case. (Docket 1906.)
July 28. Hearing in Chicago Helicopter Case. Postponed from July 14. (Docket 2384 et al.)
Aug. 25. Hearing in case involving additional service in California-Nevada area. Postponed from July 17. (Docket 2019 et al.)
Sept. 2. Hearing in Latin American Certificate Amendment cases of Panagra and Braniff. (Dockets 2527 and 2622.)
Sept. 8. Hearing on Mid-Continent's proposed service between Minot, N. D., and Regina, Saskatchewan. (Docket 628.)
Sept. 29. Hearing on Mid-Continent's application for alternate Kansas City-New Orleans Route. (Docket 1956.)
Oct. 7. Hearing involving additional Florida Area Service. Postponed from Aug. 12. (Docket 1668 et al.)
Nov. 15. Hearing on Board's Investigation of Consolidated Airfreight Tariff Agreement. (Docket 2719.)

NEW AVIATION PRODUCTS

Altimeter Setting Indicator

Special altimeter setting indicator for use at airport control towers, airway control stations, and weather stations has been developed by **Kollsman Instrument Div. of Square D Co.**, 80-08 45th Ave., Elmhurst, N. Y. It is stated to give direct, continuous, and very accurate readings of prevailing sea level pressure, with a wide range of station elevation settings of 3,400 ft. Computation and adjustment necessary with mercurial barometers and sensitive altimeters are eliminated in new instrument by continuous and automatic indication of exact setting number. Basically, new instrument is precise anerois barometer actuated by evacuated springless aneroid diaphragm, movement of which is translated to pointer through high precision gear train. Hysteresis and friction are reduced to a minimum through use of a novel design of frictionless spring suspension in place of pivots and jewel bearings.



Insulated Antenna Cuts Static

Precipitation static in aircraft communication is reported largely overcome with use of insulated aircraft antenna wire developed by **Federal Telephone & Radio Corp.**, Clifton, N. J. Designated Intelin Type K-1064, new wire gains its effectiveness by shielding of actual conductor with a jacket of polyethylene insulation. Wire has tensile strength of 127,000 psi. minimum.

New Heavy-Plane Brake Drum

Greater safety and economy are reported for new type heavy-aircraft brake drum developed by **Copperweld Steel Co.**, Glassport, Pa. Drum has friction surface of special wear-resisting alloy steel and an outside layer of copper with copper fins. High thermal conductivity of copper rapidly dissipates friction-generated heat to atmosphere, at same time helping to maintain more uniform temperature over entire brake drum surface. Company states one major airline is now equipping its DC-3s with new drums, which will be marketed in aircraft field through The B. F. Goodrich Co.

Summer Coat for De-Icers

Protection against destructive aging of de-icer rubber during hot weather—making it unnecessary to remove, wrap, and store de-icers during summer—is announced by **The B. F. Goodrich Co.**, Akron, Ohio. New development is a thin, rubber-like "summer film" which can be easily applied over rubber boots during hot weather, then readily stripped off when icing season returns. Filmed de-icers can still be operated if unseasonal icing conditions are encountered.

Offers Jeep Fueler

Marketed through **Aircraft Fuel Equipment, Inc.**, 790 Washington St., Anthony, R. I., is Jiffy aviation fueler, all-weather vehicle built on chassis of Universal Jeep. Equipped with 200-gal. tank, oil supplies, fire extinguisher, and standard safety devices, fueler is designed to service all types of light and medium size planes. Specifications: Pump, Granco, 1¼ in. with bypass (35 gal. per min.); air release unit, Bowser, 1¼ in. piped to dome of tank to avoid overboard fume discharge; micron filter, Bowser; meter, Bowser, Exacto, calibrated in tenths; hose, 25 ft. standard bonded ¾ in. gas hose with couplings; nozzle, standard, equipped with 100 mesh screen with inlet check; main shut-off valve, emergency release type; filler cap, dome type manhole cover equipped with three-way valve and fire screen; tank sump, cap. 7 gal. with drain valve; ground wire, 25 ft. static wire bolted to chassis; ground chain, bolted to chassis; and strainers, 60 mesh in suction line between tank and pump, 90 mesh built in air-release, and 100 mesh in nozzle.

Offers New Passenger Ramp

Economy Aeroramp, made by **Airquipment Co.**, Burbank, Cal., is designed for passenger loading requirements (except nose loading) of multi-engine planes where door sill is within 51-120 in. height range. Unit incorporates a new type hydraulic mechanism, fairings, laced canvas side panels, and self leveling steps. Swinging platform for door-free action or unusual loading operations. Stairs and platform are covered with non-skid, oil- and weather-resistant rubber treads. Ramp has molded rubber tired wheels and twin cam action. Lever operated locks prevent position slippage.

Information Tips

Uses of New Rigid Metal

Many applications of Rigidized metal, product of a special design-strengthening and texturizing process using both ferrous and non-ferrous sheet and strip, are described and pictured in new booklet issued by **Rigid-Tex Corp.**, 658 Ohio St., Buffalo 3, N. Y. Offered in variety of patterns, strong but exceptionally light material is stated to be particularly suitable for aircraft firewalls, instrument boards, seats, flooring, galley equipment, bulkheads, mufflers, and treads. Product is being used in new experimental Bell helicopter for flooring, servicing catwalk, and door kick plates.

Anti-Vibration Mountings for Engines

Information on anti-vibration engine mountings—the new Dynacone for lightplanes and the Dynafocal for executive type craft—is available from **Lord Mfg. Co.**, Erie, Pa. Former, termed easily applied rubber-in-shear product giving high degree of isolation of propeller and engine disturbing frequencies, is offered for 4- and 6-cyl. Continental, Franklin, Jacobs, and Lycoming plants. Latter is 3-point link-type suspension which is modification of 5-point type used on commercial planes. It is being designed into executive craft employing Jacobs L4MB and Continental R-670 engines. Also available from company is new Bulletin No. 106 providing photo and sketch illustrations of firm's various Multiplane bonded-rubber mountings.

"Flexonic" Products

Full line of products made by **Chicago Metal Hose Corp.**, Maywood, Ill., is covered in company's new Catalog G-47. Particularly stressed is firm's employment of "Flexonics" (defined as "science of controlled bending of thin metals for use under varying conditions of temperature, pressure, vibration, and corrosion") in achieving advances in design and manufacture of various flexible metal conduit units and other aircraft parts.

Sky-Broadcasting Equipment

"Sound Broadcasting From Airplanes" is title of mimeograph paper available from **University Loudspeakers, Inc.**, 225 Varick St., N. Y. C. Described is loudspeaker equipment offered by company for sky-broadcasting commercial advertising. Installation of a unit in a Piper Cub is detailed, and method of making announcements it outlined.

Three New Multi-Channel Transmitters

Comprehensive color booklet from **Federal Telephone & Radio Corp.**, 100 Kingsland Rd., Clifton, N. J., describes three new multi-channel communications transmitters for ground-to-air and point-to-point service. Included is transmitter buying chart indicating how basic equipment can be expanded to meet future requirements.

Booklets on Magnets and Plastics

"Permanent Magnets" is title of 35-page illustrated booklet from Metallurgy Div., Chemical Dept., **General Electric Co.**, Pittsfield, Mass. Description of use of more than 300 permanent magnets in each B-29 prefaces details of design, characteristics, and materials. In addition, a new 64-page booklet, "Textolite Laminated Plastics," has been released by company's Plastics Div. at Pittsfield. Engineering, properties, and applications of these laminates are treated, and a list of 44 grades of sheet material is included. There are various aviation applications.

Welding Electrodes and Alloys

Enlarged edition of a bulletin covering Ampcoloy resistance welding electrodes and alloys is being distributed by **Ampco Metal, Inc.**, Milwaukee 4, Wis. Known as Bulletin 68B, it is profusely illustrated with diagrams of tips and holders. Also presented are tables of alloy properties, applications, stock sizes, recommended electrode material, etc.

Four-Purpose Impact Tool

New 4U universal electric impact tool, stated to do work of four special-purpose tools, is publicized by **Ingersoll-Rand**, 11 Broadway, New York City 4, in photo-illustrated color folder. Using standard at-

tachments, tool will apply and remove nuts, drill, ream, tap, drive and remove screws and studs, extract broken cap screws and studs, run wire brushes, do hole saw work, and drive wood augers. Its free speed is 2,000 rpm., and it will deliver 1,900 rotary impacts per min. under load. Weight of tool is 6½ lb.

Plier and Wrench Catalog

Described and illustrated in new company Bulletin 4728 are all pliers, adjustable wrenches, and pipe wrenches now marketed by **Plomb Tool Co.**, 2209B Santa Fe Ave., Los Angeles 54, Cal. Included are 24 pliers, 12 adjustable wrenches, and 6 pipe wrenches.

Cold Cleaner for Engine Parts

Decarbonizing, degreasing and bright-cleaning of blocks, pistons, crankcase assemblies, carburetors, and other parts with company's Samson cold cleaner is discussed and illustrated in new folder released by **Cee-Bee Chemical Co.**, 655 E. Gage Ave., Los Angeles 1, Cal. Also described is open tank immersion as well as cleaning in Samson Junior and Midget parts-cleaning units.

Jet Engine Presentation

Attractive 15-page color booklet, B-3834, "Westinghouse Jet Propulsion," is being mailed by **Westinghouse Electric Corp.**, P.O. Box 868, Pittsburgh 30, Pa. Yankee line of axial-flow jet engines is presented, with descriptions of 19XB Yankee, turbojet powering Navy's FD-1; 9.5-A Yankee, turbojet midget of 9.5 in. dia.; and new company turboprop, turbine drive airscrew engine in intermediate altitude and speed range. Graphic tables chart relative performance characteristics of basic types of thermal jet power plants, and thrust, thermal efficiency, propulsive efficiency, fuel weights, and probable range of flight speeds are considered.

Electrical Handbook

Comprehensive collection of electrical service bulletins are contained in 11th edition of "Operation and Maintenance Handbook" offered by **Delco-Remy Div., General Motors Corp.**, Anderson, Ind. Included are test specifications on all active company models of distributors, generators, cranking motors, and regulators. Three-color book contains over 200 pages. It is being distributed at list price of $1.50 through company's field service organization, United Motors Service, 3044 W. Grand Blvd., Detroit 2.

Electrical Distribution Limiters

"Positive Protection for Aircraft Electrical Distribution" is subject of new Bulletin 47F1 being distributed by **Burndy Engineering Co.**, New York City 54. Covered are limiters for 120-208v., 400 cycle a.c. circuits, also for 30v. d.c. circuits; mountings for a.c. and d.c. limiters; and aircraft Hylugs for a.c. and d.c. limiters.

Aviation Products Booklet

Aviation products and broad research facilities are treated in new 16-page color booklet B-3775 from **Westinghouse Electric Corp.**, 306 Fourth Ave., Box 1017, Pittsburgh 30, Pa. Covering eleven company plants, products outlined include airborne electrical equipment, Micarta pulleys and structural parts, lamps and lighting equipment, turbojet engines, engine test units, power supply and maintenance items, and communications units and accessories.

Oxygen System Sealer

Use of company's Oxyseal compound for improved pipe thread sealing in aircraft oxygen systems is subject of color leaflet No. A45 issued by **Parker Appliance Co.**, Cleveland 12, Ohio. Reported as non-flammable and non-seizing, compound is stated to meet —70 deg. to 302 deg. F. temperature tests and to be applicable on brass, steel, or aluminum alloy. Firm's lubricant products are also described.

New Weatherproofing for Windshields

Method of permanently weatherproofing windshields and windows is described in 20-page Catalog 100 issued by **Inland Mfg. Div., General Motors Corp.**, Dayton, Ohio. Special self-sealing weather stripping is stated to give lasting seal, to simplify body construction, and to reduce assembly labor costs. Glass and body panel fit channels in strip, then filler stripping is inserted to complete job.

NEW AIRPORT CONSTRUCTION

PROPOSED WORK

Richmond, Ind. — AIRPORT IMPRVS. — Bd. Aviation Commrs., W. Davis, chn., City Hall; municipal airport imprvs., administration bldg., hangars, paving. $152,000. S. W. Hodgin, City Hall, engr.

Fort Worth, Tex.—AIRPORT BLDG.—Purch. & Contg. Dept., 8th Army Air Force, Fort Worth, Officers' Club Addn. T-3-102. Fort Worth Army Airfield. **$205,000.**

Fairbanks, Alaska—AIRPORT—Town, municipal airport, incl. 200x5,500 ft. asphaltic concrete runway, turn-arounds, and taxiways, lighting, parking and sodded area, and terminal bldg. $1,198,200.

Yellowknife, Northwest Territories—AIRPORT IMPRVS.—Dominion Govt., Ottawa, Ont.; road construction at airport, $1,180,000; airport paving, $350,000. Dept. Mines & Resources, Ottawa, Ont., engr.

Rimouski, Que.—AIRPORT BLDG.—Rimouski Airlines, Ltd., Rimouski; aviation school, $100,000.

LOW BIDDERS

Champaign, Ill.—AIRPORT IMPRVS.—State Dept. Aeronautics, 503 S. 7 St., Springfield; airport imprvs., from General Paving Co., 30 E. John St., $89,308.

Peoria, Ill. — AIRPORT GRADING — State Dept. Aeronautics, 503 S. 7 St., Springfield; airport grading, imprvs., etc., Peoria Municipal Airport, for Peoria Pleasure Driveway & Park Dist., Glen Oak Park, Peoria, from Clark Bros. Co., 724 Kansas Ave., $106,788.

Springfield, Ill.—AIRPORT IMPRVS.—Springfield Airport Auth., 207 S. 6th St.; airport imprvs., from Wright Constr. Co., Farmington, Mich., $164,387.

Grand Marais, Mich.—AIRPORT—State Dept. Aeronautics, Capitol City Airport, Lansing, airport and runway construction, from P. C. Miller, Comstock Park. $210,310.

Houghton, Mich. — AIRPORT IMPRVS. — State Dpt. Aeronautics, Capitol City Airport, Lansing, airport imprvs., incl. $4,500 runway, from Thornton Constr. Co., Hancock. $575,408. G. R. Richardson, ch. engr. State Aeronautics Comn., Capitol City Airport, Lansing, engr.

Midland, Mich. — AIRPORT IMPRVS. — State Dpt. Aeronautics, Capitol City Airport, Lansing, June 4, runway, from Fisher Sand & Gravel Co., Midland. $92,533. G. R. Richardson, ch. engr. State Aeronautics Comn., Capitol City Airport, Lansing, engr.

Seattle, Wash.—AIRPORT IMPRVS.—Port of Seattle, Bell St. Terminal, Zone 1, June 18. 300,000 gal. rein.-con. reservoir with concrete roof at Seattle Tacoma Airport, from C. Anderson, Dexter Horton Bldg., Seattle, Zone 4. $41,620.

Oklahoma City, Okla.—AIRFIELD BLDG. REPAIRS—U. S. Eng., P.O. Box 61, Tulsa, Zone 2; repairs, alterations, enlargement airplane repair bldg. at Tinker Field, Serial 34-066-47-67, from D & D Constr. Co., Colcord Bldg. $277,818.

Rapid City, S. D.—HANGAR—U. S. Eng., 1709 Jackson St., Omaha, Neb.; hangar at Army Airfield, from Steenberg Constr. Co., W. 1757 1st Natl. Bank Bldg., St. Paul, Minn., $1,402,968. Est. $1,370,000.

CONTRACTS AWARDED

Pittsburgh, Pa.—AIRPORT WATER SUPPLY—Allegheny Co., County Office Bldg.; water supply sys. at Greater Pittsburgh Airport, Moon Twp.; Contr. A, standpipe, to Pittsburgh Des Moines Steel Co., Neville Island, $48,450; Contr. B, standpipe electrical work, to Devlin Electric Co., Bessemer Bldg., $1,194; Contr. C, 11,000 ft. 10 in. waterline, to Bouquet Constr. Co., 4662 Old Boston Rd., Pittsburgh, $56,031. Grand total $105,675. Est. $120,000.

Quonset Point, R. I.—AIR STATION EQUIPMENT—Pub. Wks., Naval Air Station, Quonset Point, 5 elevated tanks, water sys., repairs, incl. painting tanks and towers; Spec. 18,333, to National Contg. Co., Shaw St., Tiverton, $26,910.

Spokane, Wash.—AIRPORT IMPRVS.—U. S. Eng., Textile Tower, 7 and Olive Sts., Seattle, Zone 1; 500,000-gal. rein.-con. covered reservoir, 21x26 ft.; rein.-con. pumphouse at Army Air Base, to McInnis & Roberts & Henry, George and Son, Hutton Bldg., $54,613.

St. James, Man.—AIRPORT—Dept. Transport, Ottawa, Ont.; Stevenson Airport addn., to Commonwealth Constr. Co., Ltd., Royal Bank Bldg., Winnipeg. Approx. $990,000.

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • PLANES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE

60¢ a line, minimum 4 lines. To figure advance payment count 6 average words as a line.

POSITIONS WANTED (full or part-time individual salaried employment only), ½ above rates.

PROPOSALS 75¢ a line an insertion.

INFORMATION

BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPAYED RATE:

The advertising rate is $9.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.

NEW ADVERTISEMENTS received Thursday will appear in the issue dated second Monday following subject to limitation of space available

SELLING OPPORTUNITY OFFERED

SALES AGENCY—An opportunity to build a business of your own under the direction of a national aviation sales organization. Unusually high earnings possible (Upwards of $1000 per month). You must have sales ability, be willing to work hard and sincerely believe in the future of aviation. Sale of planes or equipment not involved. Five to ten thousand dollars required depending on the territory. A knowledge of aviation is helpful but you must not now be a flight operator. Only one appointment open from each non-competitive market area. Give full particulars of your background and how you can be reached by telephone to arrange a preliminary interview. RW-1154, Aviation Week, 68 Post Street, San Francisco 4, Cal.

POSITIONS WANTED

AIRLINE TRANSPORT Pilot 14 years' experience, 7,400 hours total; 5,000 hours as Captain on two- and four-engine aircraft. No accidents. Can furnish best of references. Desire position as company pilot or Feederline pilot. 35 years old. PW-1151, Aviation Week, 630 N. Michigan Ave., Chicago 11, Ill.

INTERESTED IN Latin America. Have served in several responsible capacities in aircraft and engine maintenance. Familiar with flight, Maintenance, Planning problems. Speak Spanish fluently. PW-1152, Aviation Week, 520 N. Michigan Ave., Chicago 11, Ill.

NAVAL AVIATOR. Plane Commander, just released desires executive or corporation flying position. Experience: five years in aviation, qualified in most naval aircraft; police official, Commercial Rating (S & ME Land; ME Sea; instrument). No accidents. French and Spanish Languages. Single, Age 25. Excellent health and references. Free to travel. George H. Leach, Jr. 50 South St., Campello, Mass.

EXECUTIVE PILOT—15 years executive experience in merchandising, advertising, management and personnel with syndicate chain stores. Over 4000 hours civilian and army equipment. Commercial, instructor, instrument, single and multi-engine. A. T. C. experience in Canada, Alaska, India and the U.S.A. Age-35, single. Available thirty to sixty days. W. C. Pace, 500 Franklin, Boise, Idaho.

AIRLINE TRANSPORT Pilot, 6300 hours 0-6600 hp rating, 12 years experience in aviation flying all types of twin and 4 engine equipment on domestic and international airlines and executive pilot. Can furnish best of references. Married, reliable. Desires position with company as executive pilot. PW 1135, Aviation Week, 330 W. 42nd St., New York 18, N. Y.

BUSINESS OPPORTUNITY

Old Established Air Service Operations

Paved field, major mid-western city, includes 18 single and twin engine late model radio equipped airplanes. Repair shop, equipment and parts. Large busy Flight School, a real money maker. Good charter business. Lucrative aid transport contracts. Valuable distributor and dealer franchises. This is one of the nation's most successful operations. Gross better than $150,000.00 per year. Owner retiring, give away price for immediate action $75,000.00 lock, stock, and barrel including all equipment, airplanes, contracts, and franchises. Unprecedented opportunity. Some terms. BO-1153, Aviation Week, 520 N. Michigan Ave., Chicago 11, Ill.

BOOKS

New text "Principles of High Speed Flight"
$2.50. Transonic and supersonic aerodynamics, turboprops, turbojets, ramjets, rockets. Table of contents, free on request. Southeastern Research Inst., Inc., Box 1331, Atlanta, Ga.

BOOKS

Aeronautical books.
For any book publication on aviation write to us. We have them in stock and can give prompt service. Send for our catalog, or when in Chicago browse around our bookstore. We are exclusive dealers in aviation literature. Aviation House, Room 1514, 17 N. State St., Chicago 2, Ill.

REBUILDING

Aircraft batteries rebuilt
New Plates and separators. Your case cover and costs. Let us quote. Bowers Battery Mfg. Co., Inc., Reading, Pa.

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New BG-4B2S Spark Plugs
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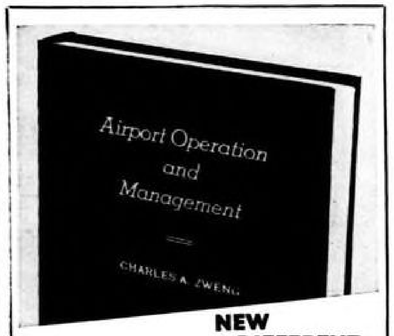

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EDITORIAL

Aviation Week Takes Its Stand

Aviation Week, in its first issue, presents its editorial viewpoint on top aviation issues. In the tradition of its two outspoken predecessors, Aviation and Aviation News, this new magazine, on this page, will leave no opportunity for doubt on its editorial position.

Yet the technical and news pages will be maintained rigidly impartial. Every editor and correspondent is under instructions to base every report on the significance of his facts to commercial aviation, and on service to industry.

Challenging comment from readers is not only invited. It is essential if any publication is to remain vigorous, informative, and attain indispensability to its industry. Every letter received from readers who indicate their opinion of this first issue of Aviation Week will be acknowledged. A letters column will be introduced in the near future, where readers may argue with the writers on Aviation Week, or with the editor for the opinions expressed here.

The following stands on current issues may start the arguments:

Competition: A strong conviction for the private enterprise system is responsible for an abhorrence of unnecessary monopoly. The chosen instrument or community company proposal demands unnecessary monopoly. Aviation Week is unequivocally against it.

Attitude Toward Government and Industry: Although an aviation business paper, Aviation Week does not condone extravagance and inefficiency in any state or federal government aviation agency. It is common practice of the defenders of waste to cry treason when an aviation magazine attacks an aviation agency editorially on such charges. Let them cry. The facts will speak for themselves.

Inefficiency and short-sightedness are as unworthy of business and industry as of government. But they seldom flourish so easily in business. Competition sees to that.

The trend to government paternalism has increased this public subservience to many of government's dicta. The press has no greater opportunity for public service than its ability to shed lights on the policies of government and the motives inspiring them.

Military Aviation: Readers of Aviation and Aviation News have read for months of the deterioration of our air forces, and the deep concern felt by our military and naval leaders, Fortunately, the newspapers in recent weeks have awakened to this problem. Aviation Week is convinced that continuation of an air force in being—the largest in the world—back by an efficient and expandable aircraft manufacturing industry, are the keys to peace. It is obvious that no other country must be allowed to surpass us in research.

Yet, we do not want the sky darkened by aircraft, nor the public's money squandered on unnecessary and second rate procurement, nor on WPA-type research centers. Those who direct our Army and Navy expenditures owe as great an obligation to the taxpayer to disburse his funds wisely as they do to protect him from foreign aggression. Aviation Week will never fail to strike out editorially against mismanagement, stupidity, and pettifoggery, in the military services as in any other field.

Private Flying: We know of no other aviation publications which have reported so consistently and so constructively through the years the activities of the nation's fixed base operators. Editorial support has been forthcoming time after time because of our faith in this phase of aviation.

Despite the recent downward trend in personal aircraft production, sales and service, the future of personal flying over the long-pull must be a growth-curve. The skeptics we see and hear today are those who consider our problems insuperable. They ignore the drive for perfection, the technical potential of this country, and the possibility of far-reaching discoveries.

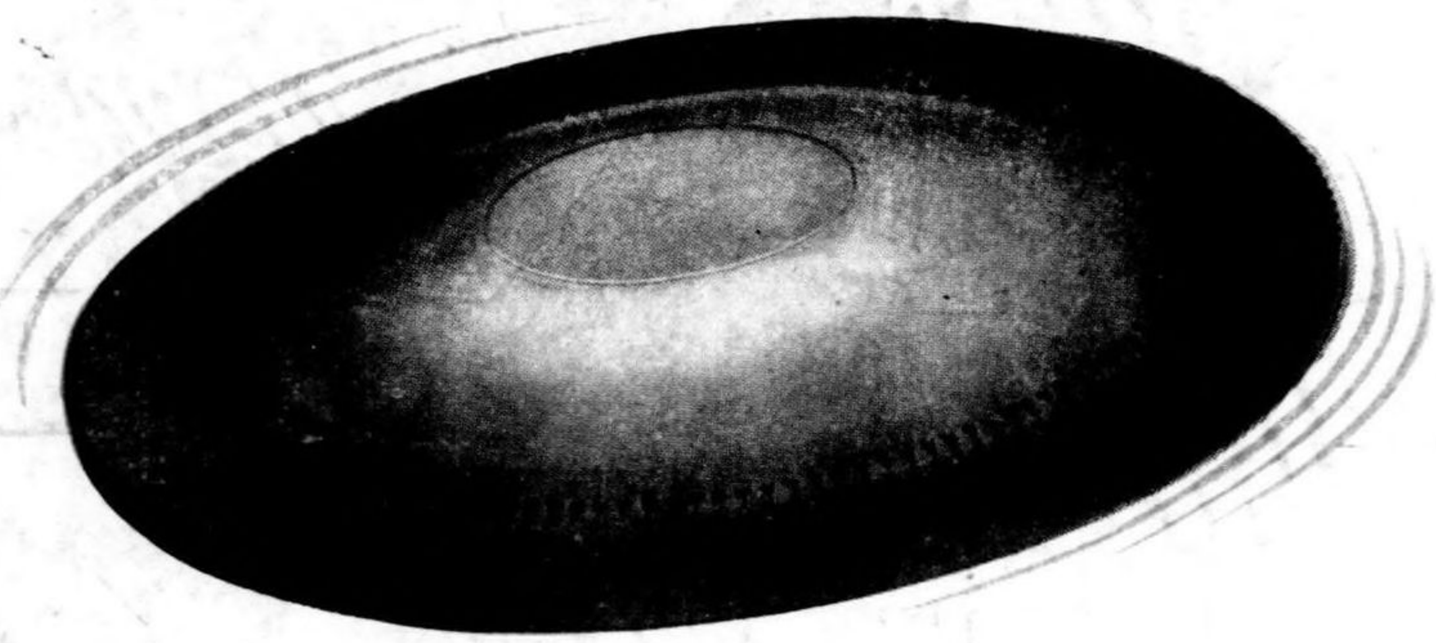
These discoveries are inevitable, and those who turn thumbs down on personal aviation will be proved as wrong as those short-sighted skeptics in Billy Mitchell's day who said the airplane would never amount to anything in war.

Air Transport: McGraw-Hill's deep interest in air transport is evidenced by its publication of a monthly magazine by that name. The nation's airlines are the finest the world has even seen. Aviation Week, like the magazine Air Transport, will comment editorially on developments in this dynamic industry.

But the possibility of drastic and unfair restrictions which may be clamped down by the President's accident investigating board represents the darkest cloud on the horizon. This editorial page will consider the President's board a matter of top priority. U. S. airlines already are far superior to the carriers of all other countries, in safety as in other categories. Many airline-wise persons already refuse to fly on foreign-operated transports because of questionable maintenance and operations procedures and general technical inferiority. The Board must not be the instrument for setting back our own lines, yet permitting foreigners to come into this country under inferior standards.

ROBERT H. WOOD

This red hot rotor turns at 30,000 r.p.m.!



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