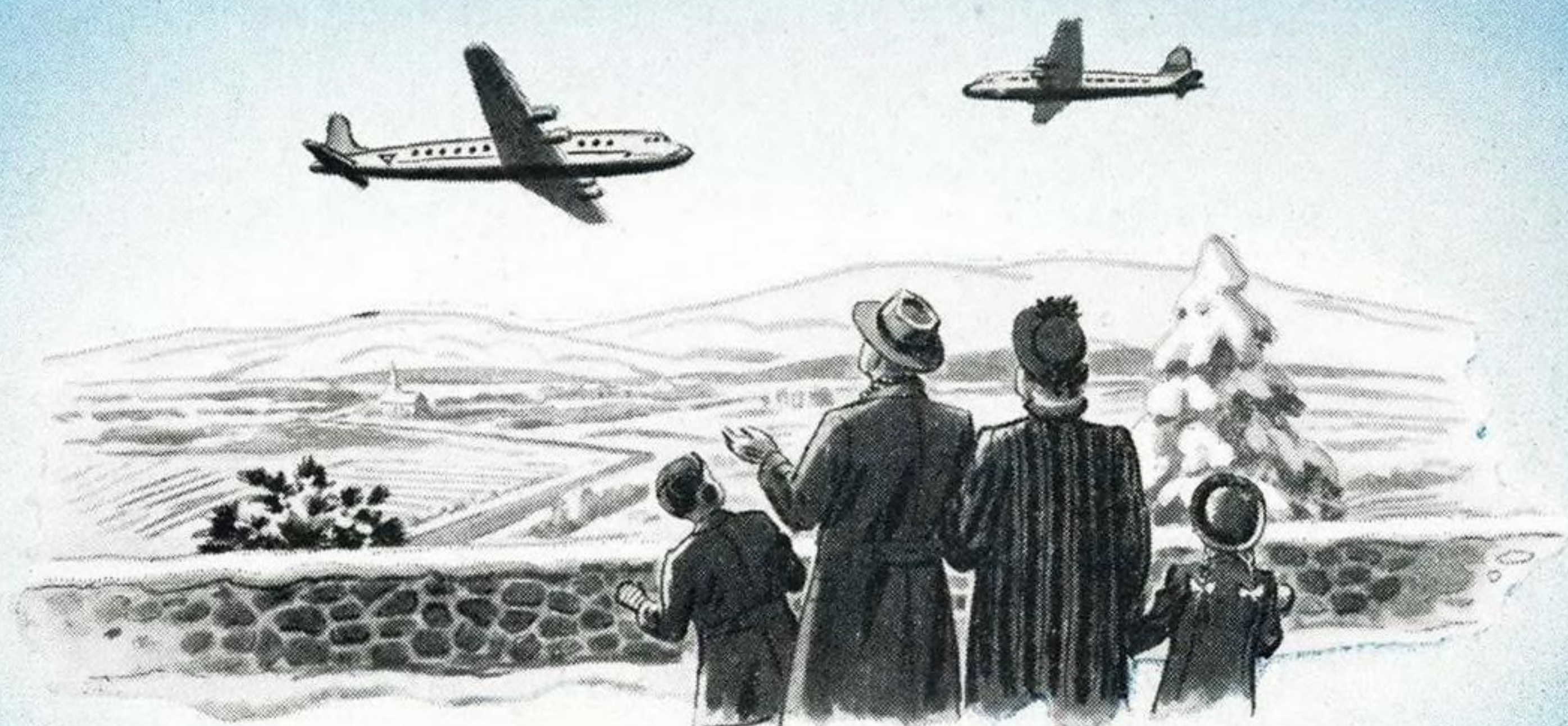


# AVIATION WEEK

DEC. 29, 1947

INCORPORATING AVIATION AND AVIATION NEWS A MCGRAW-HILL PUBLICATION

## Sentinels of Peace



"A just and lasting peace among ourselves and with all nations" . . . that was the goal which Abraham Lincoln set for his countrymen eighty-two years ago. It is the goal toward which we are striving today—more earnestly than ever before. Though the ideal may seem far short of attainment, lasting peace throughout the world represents the hope and

aspiration of men of good will everywhere. Winged through the skies on friendly missions, America's planes are reminders of the might which must ever be the bulwark of permanent peace. Our air fleet has helped to make this country strong; if we are to continue invincible, we must maintain it. Only a powerful America can remain a peaceful America.

*Serving World Aviation*

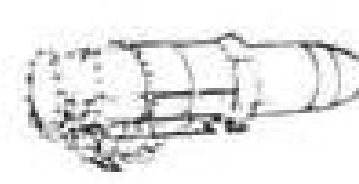
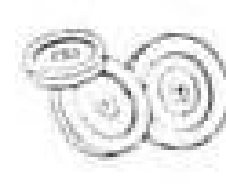


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SHOP REPAIRS  
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J-94759



## B. F. Goodrich tires outwear concrete in landing tests

**R**UBBER HITS CONCRETE with terrific impact when Lockheed's new drop-test machine goes into action. This mechanism tests landing gear by duplicating an actual landing.

The landing gears are lifted to the desired height on the 40-foot tower and the wheels are spun until they reach a speed of nearly 100 miles an hour. Then the landing gear drops to the concrete platform, simulating an airplane's 100 mile an hour touch-down on an airport runway. And for a few seconds, smoke pours from the tires as the wheels skid to a stop.

These punishing 125,000 pound

blows are a severe test of the B. F. Goodrich tires used on the landing gear. Here's how they stood up: following the first eighty tests, Lockheed engineers reported that although a hole was worn in the concrete "runway" on which the tires landed, the tires themselves showed no appreciable wear!

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Developing tires to meet the needs of today's and tomorrow's planes is a constant project of B. F. Goodrich engineers. The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.

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memorandum

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See your Marman Catalog for detailed information on some of the many standard types available.

Write for specific design proposals on any clamping problem.



# AVIATION WEEK

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Dec. 29, 1947

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Some Short jottings for airline operators, charter companies, and V.I.P.s

## Presenting the SEALAND...



### You've only got to ask

The Sealand, new 5/8-seater amphibian, is now coming off Short's production line. It's worthy of your attention wherever you are operating and whatever your aviation purpose. For the Sealand is the most adaptable, universally useful aircraft of its type ever designed. It's just the thing for charter companies and feeder lines. It is readily converted into a freighter, an ambulance, a mobile showroom, or—equipped as an office—a business man's transport. And it's as light and easy to handle on land as on water.

### Getting down to it

Let's have a few estimated performance figures. The Sealand, at maximum economic cruising power—altitude 6,600 ft.—does 174 m.p.h. Its range, at 127 m.p.h., is 776 statute miles with full tanks (120 gallons) and 926 lbs. of freight. With less fuel (54 gallons) it will carry 1,400 lbs. of payload, which is roughly equivalent to 7 passengers and baggage, a range of 305 statute



Passengers will praise the Sealand's attractively designed interior, finished in washable leather fabric, its comfortable seating and wide windows

miles. Take-off distance is only 575 yds. (in 28 seconds) from water; 370 yds. from land. Landing speed is 69 m.p.h., and service ceiling is 21,600 ft.

### Where breeding counts

Of course, great care has been taken to ensure that all Air Registration Board safety requirements have been met, and that airworthiness is unimpaired if one engine fails. Why "of course"? Because for nearly 40 years Shorts have been designing and building their famous family of flying boats. The Sealand thus has a proud ancestry. We suggest that, if you would care to operate this new amphibian, you write for complete details and tell us your requirements.

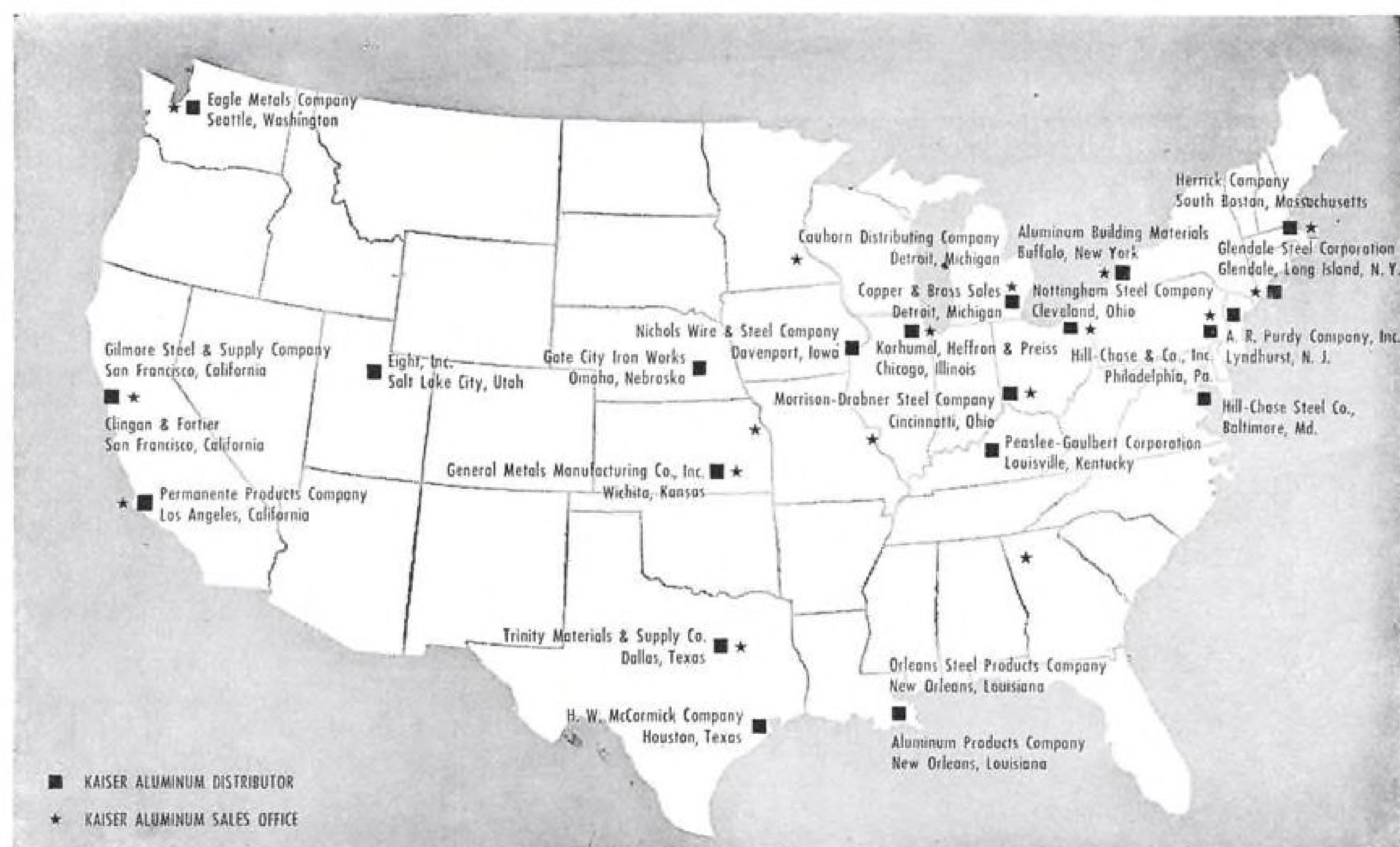
The Sealand is reliably powered with two 330-h.p. D.H. Gipsy 70 engines. The cockpit is neatly and effectively laid out, and affords an exceptionally wide field of vision.

**Shorts** The first manufacturers of aircraft in the world

SHORT BROTHERS & HARLAND LIMITED, QUEEN'S ISLAND, BELFAST







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*faster!*

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AVIATION WEEK, December 29, 1947

## THE AVIATION WEEK

**YEAR IN REVIEW**—Perhaps the most significant  
and encouraging development of the year that ends this  
week is one that cannot be highlighted by facts and  
figures, and will not show on balance sheets.

It cannot even be described simply. Nearest approach  
would be to call it a shaking-down. It frames the pic-  
tures of all three main phases of aviation: manufactur-  
ing, transport and sales and service.

The true nature of this shaking-down process might  
be delineated in calendar terms. The result of what  
happened in aviation business management in 1947  
should make that the last "postwar year." Turning the  
calendar to Jan. 1 does not make basic changes in the  
aviation structure, but because of what happened in  
1947, 1948 should be the first true peacetime year.

The contrast between aviation and general industry  
is marked. In a year when over-all industrial profits  
were at new highs and employment was also at a new  
peak, the two largest branches of aviation—manufactur-  
ing and transport—were losing money and employment  
was on the downgrade.

Nothing could better illustrate that aviation, as its  
spokesmen have often stated, had a greater reconversion  
job than any other industry.

**MANUFACTURING**—In retrospect, it is plain that  
1946 and early 1947 were deceptive as far as the recon-  
version prospect was concerned. It would also appear  
that some underestimated the size of the undertaking.

Lightplane manufacturers were an early starter in the  
reconversion race and in 1946 made a record probably  
not exceeded by the producers of any other consumer  
item. But the market was not ready for the high volume  
of production and the consequences in 1947 did much  
to encourage pessimism about the entire industry.

The shaking down process in the lightplane business  
in 1947 was a natural result of production outstripping  
sales efforts. It also serves, for discussion purposes, as an  
example of the industrywide shaking down that character-  
ized the year.

It points up what can be considered the salient point  
of the year's developments: the aviation industry, in  
addition to a physical and financial conversion, had to  
undergo an operational conversion. It had to switch  
its emphasis from an exclusive concentration on high-  
volume production to a procedure integrating production  
and sales.

It is to the credit of an industry—that for six years  
had been led to believe it had a ready market for its

product after the war—that it was able to change its  
thinking so radically as early as it did. That the educa-  
tional process was bearing fruit was indicated last summer  
when one prominent manufacturer drastically cut back  
production with the frank statement that output was  
exceeding sales.

**TRANSPORT**—In manner of speaking, this same sort  
of operational conversion occurred on the transport side  
of the industry. While likely to be overlooked because  
of the more familiar and easier-to-portray safety and  
financial situation of the airlines, this shaking-down in  
transport was the most important factor of the year.

Immediately following the war, the U. S. airlines  
were tossed what could be deemed the most gigantic of  
all conversion jobs: to double their route miles and  
passenger miles. They had no yardstick by which to  
gauge personnel or facility needs. It is small wonder  
that some carriers over-expanded.

In 1947, air transport—like the manufacturers—took  
the first steps toward adjusting its operations to demon-  
strated demand for its service.

**SALES AND SERVICE**—The change in business  
methods in the manufacturing segment of the industry  
was bound to foster a like shaking-down in sales and  
service. The general impression is that the rate of busi-  
ness failures in sales and service is high. This probably  
is true and is the inevitable outcome of the situation  
in lightplane manufacturing.

Although dealer and distributor margins are still a  
problem, the resurgence of the National Aviation Trades  
Association, the increasing sales of four-place planes,  
the concentration on improving airport conditions, all  
have combined to create a sounder fixed-base business.

**THE YEAR AHEAD**—With deficits in all phases of  
aviation exceeding those of the year before, it cannot  
be argued that 1947 was a "successful" year in aviation.  
But an over-all assessment of the year must stress the  
shaking-down that took place—for it will be the basis  
of whatever success the industry achieves in 1948.

Spectacular gains in production, in passengers car-  
ried, in planes sold cannot be expected to feature avia-  
tion news next year. There may be small gains in all  
categories. There may be no gains at all, even a slight  
reduction in the number of personal-type aircraft sold.

But 1948 statistics should, better than those of any  
year, give a true index of cautious, steady growth from  
a firm footing.

AVIATION WEEK, December 29, 1947



## LETTERS

### Too Many Stalls

To the Editor:

Allow me to congratulate you for the boost for the stall indicator, a much needed device. Our job here is to find out what happens to the pilot when he gets into trouble and we are not primarily interested in what causes accidents. It is however a little tiresome to find 300-3000 hour pilots stalling and losing control of "spin resistant" planes—and at the same time hear other experienced pilots brush off stall warning indicators as "unnecessary gadgets."

Our idea is that the pilots who fly entirely by the seat of their pants have their eyes—and probably their brains—in the wrong place.

We feel so strongly about the need of hammering pilots, operators and manufacturers on making use of stall warning indicators—and quick—that we would like to see your editorial (or a similar one) repeated next spring when, I am sure, lethargy about getting the instrument into broad use will be just about what it is today.

HUGH DE HAVEN, Director  
Crash Injury Research,  
National Research Council,  
1300 York Ave.  
New York 21, N. Y.

### SILA Facts

To the Editor:

AVIATION WEEK, Nov. 17 stated that a merger of Swedish airlines ABA and SILA is contemplated. Details pertaining to the merger are still to be ironed out. That is correct.

In the interest of the aviation industry, generally, and especially of the American industry, whom you spare no effort to serve, we beg to correct the statement pertaining to the privately owned SILA. . .

SILA, together with Danish airlines DDL, and Norwegian airlines DNL, since Sept. 1946 has operated Scandinavian Airlines system serving New York, Gander, Prestwick, Oslo, Copenhagen and Stockholm on a daily schedule, while Rio de Janeiro and Buenos Aires are served via Geneva and Lisbon once a week. The Boeing B-17s were operated by SILA in trans-Atlantic operations when no other craft were available in the fall of 1945 on proving flights. SAS operates only new DC-4s and has orders in for seven new Douglas aircraft and four Boeing Stratocruisers. The two B-17s referred to are no longer in operation.

EGIL TRESSELT  
Director of Public Relations  
Scandinavian Airlines System, Inc.  
New York City

### Not Forsaking Air Insurance

To the Editor:

It is apparent from your financial article on lightplane insurance Oct. 6 that you had done considerable research to get at the correct facts as to what has transpired and is taking place in the aviation insurance field.

It does appear likely that in the course of

your research some incorrect information was obtained or some incorrect conclusions developed. For example, we believe the North America Companies are often classified as one of the "newcomers" since we opened our own Aviation Dept. Jan. 1, 1946, although prior to that time our fire companies were grouped among the newcomers. I wish to assure you that our company management has no thought whatsoever of withdrawing from this field nor are we seeking any special reinsurance.

We are also inclined to question the accuracy of the statement that rate action by newcomers in the business forced the old underwriting groups to follow suit as we believe a thorough investigation would reveal the fact that unwarranted rate reductions emanated from a number of sources and undoubtedly were based on incorrect estimates of probable loss frequency and size of loss during the period immediately following the war.

Please understand that we have no quarrel with the underwriting groups. In fact, we respect and admire what they have done. However, we think possibly your article would lead to some incorrect conclusions, although in the main we agree with it.

C. A. STANFORD, Asst. Secretary  
North America Co.  
Philadelphia, Penn.

### Boreman & Clinic

To the Editor:

I commend and congratulate the author of the article on page seven with reference to the National Aviation Clinic in your issue Dec. 1.

It is an excellent analysis, and in my opinion very accurate, and clearly states both the credit and the debit side of the Clinic picture. One feature of the Clinic this year that I think you will approve of is the establishment of a definite plan for implementation and follow-up of the bills of policy that were adopted. The bills of policy approved by the Clinic will go to those most directly interested and various committees have been set up to follow up on these various bills of policy and report to the delegates, and to NAA, and to other interested sources what has happened to such bills of policy.

In other words, it was felt, unless there was to be a sound plan for following-up on the bills of policy adopted and some definite program for implementation, that much of the effect of the Clinic would be lost.

The credentials committee was instructed not to seat any delegation or group unless the delegates consisted of the top policy making individuals. I think a check of the delegation shows there were far more top policy making individuals sitting as delegates this year than ever before. But for the grounding of the DC-6s, involving a lot of immediate activity on the part of Tom Braniff and Mr. Patterson of United, both of these gentlemen would have been there as both of them called me long distance just before and during the Clinic, stating they were making every possible effort to at least attend some of the sessions. I think Mr. Smith of American Airlines will make sure that if there is another Clinic his group will be represented by top policy making individuals, and I think the Clinic was suc-

cessful enough and important enough this year to impress upon all groups the necessity of sending their top men if a Clinic is held in 1948.

ARTHUR I. BOREMAN, President  
National Aeronautics Association

## NEWS DIGEST

### DOMESTIC

Compulsory installation of stall warning devices on all private airplanes has been recommended to CAA by the committee of aviation psychology of the National Research Council after receiving a report on stall recognition flight tests at three airports, with 254 pilots and instructors.

New 115/145 Grade aviation gasoline, which steps up aircraft engine power as much as 15 percent, and is produced by blending components of the 100 octane rating gasoline previously used, has been announced as in use in U. S. Navy combat planes, and is described as "the highest performing gasoline that could be produced in quantity in emergency."

### FINANCIAL

Irving Air Chute Co., Inc. declared a dividend of 25 cents on common shares payable Dec. 30 to holders of record Dec. 26. Two 25 cent payments were made previously, in April and July, making 75 cents for the year.

Air Investors, Inc. declared an initial dividend of nine cents on the common. In addition, the regular quarterly dividend of 50 cents plus a participating dividend of nine cents on the convertible preferred, was declared payable Dec. 31 to holders of record Dec. 24.

### FOREIGN

Linea Aeropostal Venezolana, Venezuelan airline, has taken delivery on two Glenn L. Martin 2-0-2 transport planes.

International interline passenger and general agency agreement has been effected by managements of Trans World Airlines and KLM Royal Dutch Airlines, that companies will represent each other throughout their systems except in Netherlands East Indies, where KLM acts as general agent for TWA.

Alfred Denby, New Orleans, will be paid \$936,181 by the Guatemala government in settlement of a claim resulting from expropriation of Denby's airline after a 1944 revolution.

With expected opening of the Zurich-Kloten (Switzerland) Intercontinental Airport, in April, 1948, Swissair, (Swiss Air Transport Co., Ltd.) will transfer operations there from Geneva, for the north and south Atlantic routes.

# Wilco Electric Contacts and Contact Assemblies

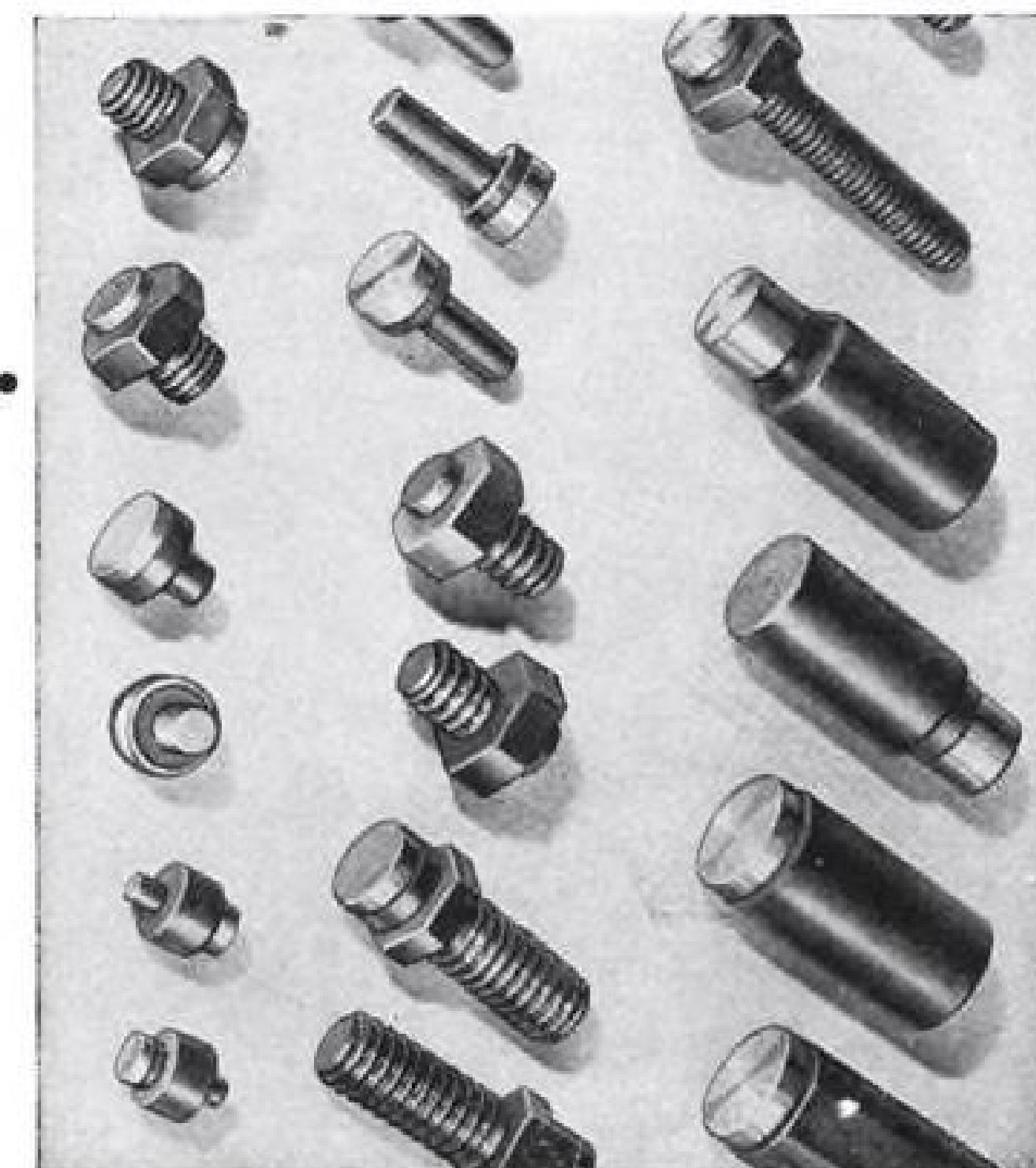
## Precision-Built for Precision Performance

### TO MEET YOUR MOST EXACTING REQUIREMENTS . . .

WILCO produces contacts and contact assemblies in gold, silver, platinum, tungsten and in alloys and combinations of these. All reflect WILCO's 33 years experience and many thousands of applications.

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are made of 99.95% pure tungsten, thus assuring the highest melting point of any contact material . . . a hard, bright, oxidation-resisting finish, high density, maximum life, low vapor pressure at elevated temperatures, high strength and arc-resisting properties. WILCO SINTERED METAL CONTACTS incorporate tungsten of the same high purity. WILCO COMPOSITE CONTACTS, faced with fine silver or silver alloy make possible considerable savings. Our sales engineers will be glad to explain details.



### WILCO Contact Assemblies . . .

Wilco Tungsten and other Contact Assemblies are assembled to thermostatic bimetal, steel, beryllium, copper and other non-ferrous metal springs, blades, brackets, arms and screws (brazed, riveted, welded, spun) . . . conform in size, shape and material to manufacturers' individual requirements . . . combine the superfine quality of WILCO contact materials and WILCO thermostatic bimetals to meet the highest performance standards.

CONSULT OUR ENGINEERING DEPARTMENT—A representative of the WILCO Sales and Engineering Department will gladly help develop the proper application of WILCO materials to your products.

### WILCO PRODUCTS INCLUDE:

**THERMOSTATIC BIMETAL**—All temperature ranges, deflection rates and electrical resistivities.  
**CONTACTS**—Silver—Platinum—Tungsten—Alloys—Sintered Powder Metal.  
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**JACKETED WIRE**—Silver on Steel, Copper, Invar or other combinations requested.  
**ROLLED GOLD PLATE AND WIRE**  
**NI-SPAN C®**—New Constant Modulus Alloy  
**SPECIAL MATERIALS** \*Reg. Trade Mark The International Nickel Co., Inc.

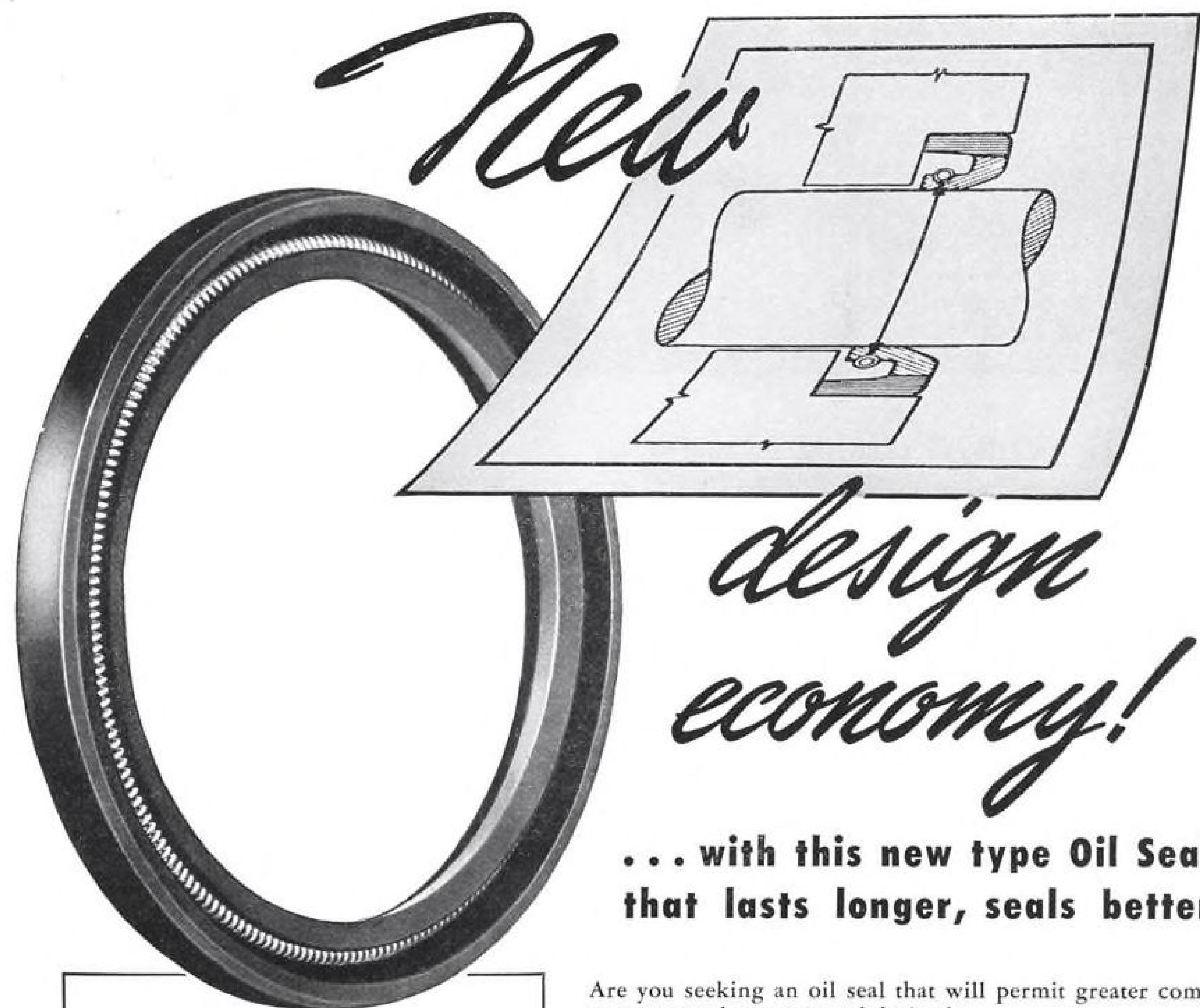
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Are you seeking an oil seal that will permit greater compactness and economy of design?

Clipper Seal may be the answer!

This new type Johns-Manville oil seal is available with a light flange section that permits designing oil seal cavities with depths as little as  $\frac{1}{4}$ ". In fact, because of its unique 1-piece design, there is no cavity mechanically practicable which is too shallow—or too deep—for a Clipper Seal.

Consisting of a rigid heel and a tough but flexible lip moulded into a single unit, Clipper Seals provide an exceptionally long wearing oil seal with superior lubricant-retaining, dirt-excluding qualities. They are easily installed and may be removed without damage. Non-metallic, they are also resistant to most forms of corrosion.

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## NEWS SIDELIGHTS

### Exit Brewster Committee

Sen. Owen Brewster will not attempt to extend the life of his special War Investigating Committee beyond its expiration date, Jan. 31. Republican leaders have decided to let the standing Committee on Expenditures in Executive Departments take over the Brewster committee's work. The inquiries probably will be handled by an expenditures subcommittee headed by Sen. Homer Ferguson, the Republican Senator from Michigan.

### Dirigibles and Subsidies

The first responsible company which is willing to invest sufficient private capital to launch an air transport service with modern dirigibles has better than even chances of winning some government subsidy, according to one high federal official.

But government policy makers have refused to consider investing in any lighter-than-air commercial project to date because they feel that responsibility for organizing and starting a dirigible airline lies with private enterprise, as in any other business venture. The official told AVIATION WEEK, however, that in no sense could the civilian government agencies be accused of an anti-lighter-than-air policy, despite the fact that neither the military nor naval forces have indicated any interest in this, up to now, still virtually untouched phase of aviation.

### Wright's Successor

Despite his difficulties as an administrator, industry and CAA alike are worried by the prospect that the successor to T. P. Wright as CAA chief will lack his keen technical knowledge. A political appointee to this job, responsible CAA officials point out, would be the worst fate the agency could sustain.

Mr. Wright told his top officials several weeks ago that if legislation did not pass raising \$10,000 government salaries, he would resign by June. Most CAA personnel believe he will leave earlier. Before Assistant Secretary of Commerce Alison was even named, Mr. Wright informed Commerce Secretary Harriman he would prefer to deal with the secretary directly on all matters. This proposal did not appeal to Harriman and the result has been a deterioration of relations between the two men.

### Mr. Douglas Should Know

A competitor of AVIATION WEEK and the public relations department of Douglas Aircraft Co. greeted with scorn the news story published in this magazine recently announcing that Douglas had definite intentions of building the DC-9. Where, it was asked, did such a story originate?

The answer: Mr. Donald Douglas said so in an interview with this magazine during his recent visit to Washington. Meanwhile his publicity men say no final decision has been reached, that the plane is still in a preliminary engineering design, and that no orders have been received or solicited. Now you have both sides of the story.

### Purse-Stringers Are Missing

A major weakness of the joint Congressional Air Policy Board is becoming evident as the deadline for a report approaches. The committee lacks proper representation from House and Senate military and naval appropriations subcommittees—the two groups which will be so influential in determining size of air force and naval aviation budgets, the key to airpower.

The only appropriations committee member on the board is Rep. Karl Stefan, Nebraska Republican. He is chairman of the House Commerce Department Appropriations Subcommittee.

### Airlines Worry the Rails

Indicative of railroad anxiety over the growth of the airlines is the pointed statement in the newest issue of Railway Progress magazine that "air passenger revenue last year was more than \$275 million, a figure greater than the railroads received either in coaches (without commuters) or sleeping and parlor cars in any year from 1937 through 1941." The publication is issued by Robert R. Young's Federation for Railway Progress.

### Travel Tax Repeal

Airline officials familiar with current congressional thinking say there is a "fairly good chance" that the new session of Congress will repeal the 15 percent tax on travel, which has continued from the war days. Actually, the air transport industry was gambling heavily

on such a repeal when it decided recently to increase its passenger fares another 10 percent. Result to the public, of course, would be the equivalent of a rate reduction.

### Fewer CAA Regions?

There is a definite proposal circulating in the Commerce Building to cut the number of CAA regions to three. Further action, if any, will be taken in the spring. Resistance within the agency is expected to be formidable, since the jobs of many officials in the nine regions would be dissolved in the shrinking process. Administrator Wright looks on the plan with favor but apparently has underestimated the opposition he will meet among his own sprawling organization. Meanwhile, the Office of Business Management headed by Assistant Administrator Edward Sturhahn is continuing its efforts to introduce business methods and efficiency in both regional and Washington offices of CAA.

### Other CAA Notes:

A major clean-up program is continuing in region 1, and its headquarters in New York City, directed by Ora Young.

Officials in Washington are discussing replacement of Regional Administrator George W. Vest in the headquarters of region 3 at Chicago, with other changes in that region likely.

Conditions in region 6 under Joseph Marriott are winning more praise from industry and public alike than mail from anywhere else in the CAA set-up, according to officials familiar with the situation. Although Marriott is liked, much credit is given his youthful executive officer, Gordon Bain.

Complaints about George Burgess, one of the two remaining deputy administrators after departure of Charles Stanton in March continue to come in both from the public and from CAA personnel. United Pilots & Mechanics Association news letter accuses Burgess of "insolence" in dealing with state aviation directors and others in the administration of the national airport program. Not yet reported is the fact that Washington National Airport's well known administrator, Benny Griffin, is likely to resign unless Burgess lets up in what is described as constant meddling. This meddling was also a factor in the resignation of Griffin's predecessor, Hervey Law.



## Congressional Sentiment Favors More Funds for U. S. Air Force

But Hill leaders balk at \$6,000,000,000 needed for 70 group program proposed by Symington and Spaatz.

The Air Force's 70-group program, requiring estimated appropriations of \$6,000,000,000 appears to have slight chance of materializing within the foreseeable future.

Rep. Albert Engel (R. Mich.), chairman of the House Appropriations Military Subcommittee, voiced widespread Congressional sentiment when he termed the suggested program "out of the question". Engel pointed out that a \$6,000,000,000 Air Force appropriation—approximately five times USAF's current year \$1,259,000,000 appropriation—would involve a parallel strengthening of the Army and Navy and mean an annual national defense budget "in the neighborhood of \$15,000,000,000"—or 37 percent of the present year national budget approximating \$40,000,000,000 and 50 percent of the \$30,000,000,000 annual budget which is the goal of the Republican party.

► **New Developments**—Two developments last week, however, pointed to substantially increased military and naval aviation appropriations for the

1949 fiscal year:

- **An Unconfirmed Report** placed the 1949 allocation for Air Force and Naval Aircraft procurement approved by the Budget Bureau at \$1,400,000,000 or approximately 50 percent over the 1948 fiscal year allocation. Aircraft procurement funds appropriated for this year total \$887,000,000, of which \$565,000,000 is for USAF procurement and \$322,000,000 for Naval Aviation procurement.

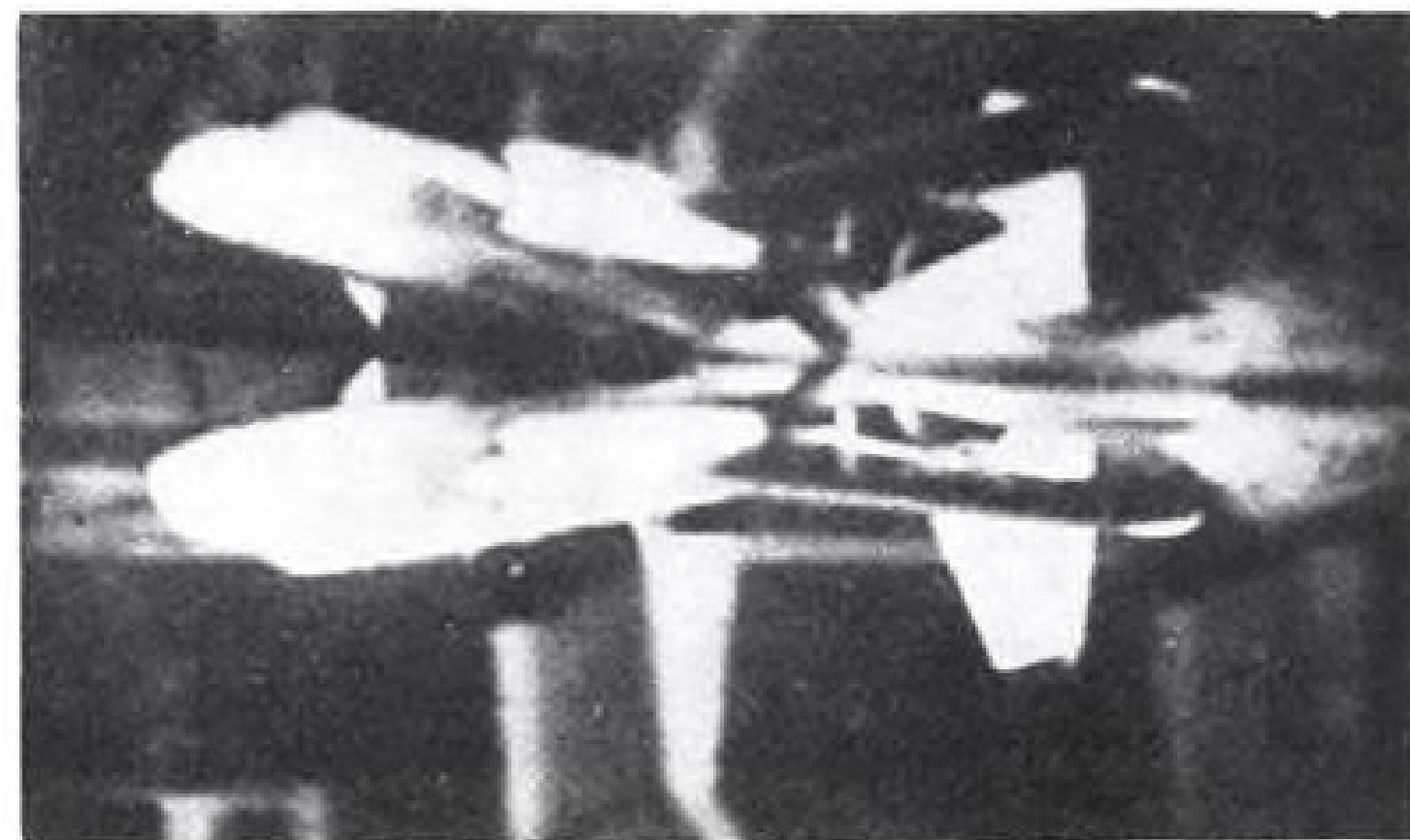
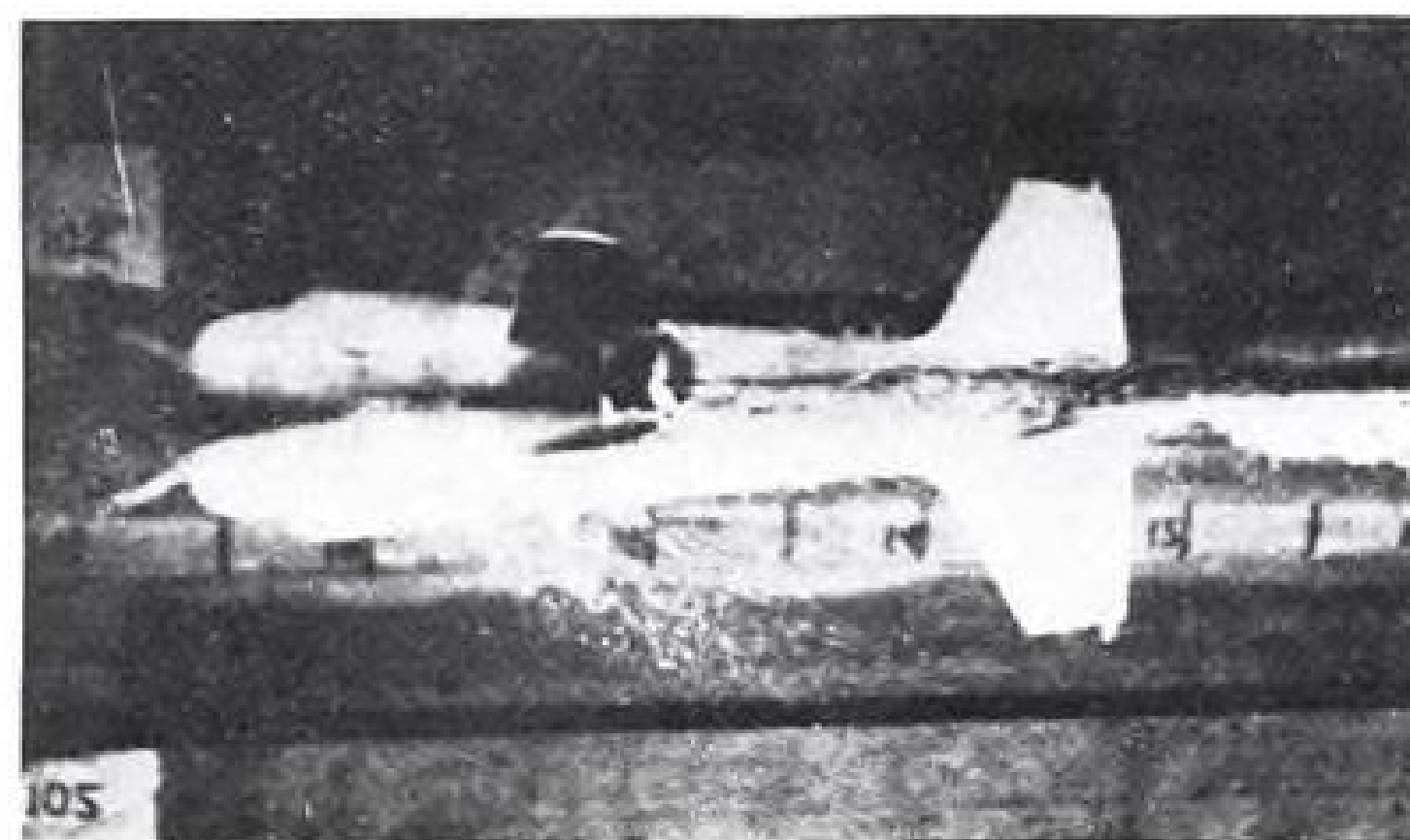
- **Chairman Owen Brewster (R., Me.)** of the joint Congressional Air Policy Board, announced that his group was prepared to recommend "greatly increased expenditures" for the Air Force and Naval Aviation. Brewster stressed, however, that his committee could "only recommend", that the final decision was up to the appropriations committees "which will weigh requirements for aviation against other requirements" for federal expenditures. Brewster's point underlined the apprehension in aviation circles that the efforts of the President's Air Policy Commission and

### Officials Resign

Three War Assets Administration officials, under fire from a House Expenditures in Executive Departments Subcommittee for accepting priority deliveries on new automobiles arranged by A. I. Lodwick, president of Lodwick Aircraft Industries, have submitted their resignations. Lodwick Aircraft, a WAA agent, has received commissions totaling \$300,000 for disposal of \$28,000,000 in surplus property.

Subcommittee Chairman, Rep. Ross Rizley (R., Okla.) declared that the three officials—Brig. Gen. James Mollison, Col. John Carey, and Col. Herschel Benedict—"should be fired out of WAA at once" for accepting favors from Lodwick. Mollison submitted his resignation from WAA, effective December 17, six weeks ago and has returned to Army service. Carey and Benedict submitted their resignations to WAA administrator Jess Lars subsequent to Risley's charge, but no action has been taken on them.

the joint policy board may be reduced to fanfare by the refusal of the appropriations committees to implement aviation



### NACA HYDROFLAP TESTS SHOW DITCHING AID

First photos of secret wartime tests of NACA hydroflap developed to hold nose of landplane bombers above water during ditchings. Device consists of a small panel in the fuselage nose which acts as hydroplane ski as bomber makes contact with water. Without the device most bombers dig nose in, breaking fuselage and sinking pieces quickly. At left model Lockheed P2V is being dropped into water of NACA Langley Memorial Aeronautical Laboratory towing tank at stimulated ditching speed. Note hydroflap lowered under nose. At right bomber model is freed from overhead trolley and hydroflaps over the water with nose well up. Lockheed P2V, Martin P4M and Convair P5Y are fitted with device. (NACA photos)



### NEW PACKET NOSE IMPROVES VISION

Closeup of Fairchild XC-119A shows new crew compartment moved from atop fuselage in C-82 to new position in nose for increased vision during landing approach. Transparent panels at floor level permit view below for formation flying and observing drop operations. Square-tipped Hamilton Standard props absorb 55% additional power of P&W Wasp Majors.

programs with funds.

► **Appropriation Bill**—Meanwhile, Col. R. S. Macrum, USAF budget officer, discounted current reports that USAF would seek a 1948 fiscal year supplemental appropriation, stating "there is no intention of so doing at present". The reports stemmed from legislation directing a \$500,000,000 supplemental appropriation, introduced by Rep.

Chester Merrow (R., N. H.)—it is generally understood, at the request of the Air Force. Rep. Engel has given a "definite no" to consideration of the Merrow bill by his military appropriations subcommittee, indicating that a supplemental USAF allocation is improbable, and in any event, would only be granted by Congress after being approved by the Budget Bureau.

First assigned as deputy commander of the newly formed Air Service Command of the AAF, Knerr witnessed the vindication of his air power pioneering in World War II. He headed the Air Service Command in Great Britain, later returning as commanding general of Air Technical Service Command, Wright Field, and to assignment as special assistant to the AAF commanding general in Washington. His most recent assignment has been secretary-general of the Air Board which he organized last year to formulate basic policy. Frank J. Wilson, retired head of the U. S. Secret Service, will act as Knerr's consultant.

## Air Force Shuffles Inspectors

**Maj. Gen. Hugh Knerr heads new division with FBI man as investigative aide; Jones transferred.**

Reorganization of the Air Force inspection service, which has been under heavy fire from the Senate War Investigating Subcommittee for its failure to investigate Maj. Gen. Bennett E. Meyers, wartime deputy chief of Air Force procurement, was announced shortly after a Federal Grand Jury indicted Meyers on six counts of perjury and subornation. The Justice Department contemplates bringing additional charges of fraud, extortion, attempted extortion, income tax evasion, bribery, and conspiracy to defraud the government against Meyers.

Air Force reorganization creates an Office of the Inspector General of the U. S. Air Force, with three divisions, to supplant the Office of Air Inspector.

Maj. Gen. Hugh J. Knerr, named Air Force Inspector General, reports di-

rectly to USAF Commanding General Carl Spaatz.

► **Airpower Apostle**—Knerr, outspoken "apostle" of air power in pre-World War II days was retired from active duty in 1939 as Air Corps Colonel, after a service career which included graduation from U. S. Naval Academy (1908) transfer to Army coast artillery (1911) and to the aviation section, Signal Corps, in 1917. He was chief of staff of the first general headquarters Air Force, under Gen. Frank M. Andrews, and previously had headed field service at Wright Field, during the formative years of the four-engine B-17 Flying Fortress.

He was ordered back to active service in 1942 after his pungent criticisms of high policy makers who delayed development and mass production of long-range bombers. A critical and revealing book, "The Fight For Air Power," bylined by W. B. Huie, was generally understood to be an expression of Knerr's opinions.

Maj. Gen. Junius Jones, who headed the old Air Inspector's office and was a principal target of the Senate subcommittee's criticism, was transferred to command Sacramento Air Materiel Area, McClellan Field, Calif. Jones will be the only major general in such an assignment. Of the seven areas, three are commanded by colonels and three by brigadier generals. Jones will replace a colonel—Col. Arthur Vanaman.

Appointed to head the three divisions under Knerr:

- **Maj. Gen. St. Clair Street**, now chief of Army and Air Force recruiting, was named Air Inspector, in charge of a division which will serve as "watch dog" over internal functioning of the USAF to assure execution of orders of the chief of staff.

- **Col. Joseph Dillon** will continue in the post he now holds, provost marshal, under Knerr's jurisdiction. The provost marshal division was previously under



the deputy chief of staff for personnel and administration.

• Joseph Carroll, an FBI inspector on loan to the USAF, will serve as chief of the security and inquiry division, which will handle investigations, utilizing the FBI and other existing government agencies to prosecute inquiries initiated by or referred to the USAF. Carroll was previously director of the enforcement division of Surplus Property Administration and War Assets Administration, then headed by W. Stuart Symington, now Secretary of Air.

The reorganization fails to correct the

basic objection raised by the Senate War Investigating Subcommittee to the USAF investigatory set-up, namely, that it is in the chain of command, functioning "under" and not independent of the USAF commanding general. During proceedings on the Meyers case, subcommittee chairman, Sen. Homer Ferguson (R., Mich.) pointed to "a natural disinclination" of the USAF "to want to investigate itself." The proceedings developed that an investigation of Meyers in 1945 was vetoed by the office of the then AAF commanding general, H. H. Arnold.

## Convair Boosts Gross on Liner

**Transport to seek CAA certification for 40,500 lb. gross weight.**

Consolidated Vultee has completed studies for a thousand pound increase in gross weight of the Convair Liner and made application to the Civil Aeronautics Administration for certification at the new weight. Although design gross weight of the 40-passenger transport is 41,500 lb., the new application contemplates an increase from the presently certificated 39,500 lb. to 40,500 lb.

Company estimates a range of 1090 miles at 67 percent power using the 2100 hp. Pratt & Whitney R-2800-CA-18 water-injection engines cruising

at 16,000 ft. with a payload of 5450 lb. in the 39,500 lb. version and 6250 lb. in the 40,500 lb. version. This range is based on an estimated specific fuel consumption of 0.515 lb./bhp./hr. on 1200 bhp. from the engines. Single-engine en route climb performance at 15,600 ft. and a gross weight of 35,000 lb. has been demonstrated in compliance with Civil Air Regulation 04.1231 (C).

► **Changes Listed**—Meanwhile, changes made in the standard 39,500 lb. version include:

Original empty weight estimate of 24,754 lb. has increased during the construction and modification stage to 26,428 lb.

Early calculations of required car

### GCA Rules

Navy Bureau of Aeronautics has established maximum errors requiring "waveoff" during GCA approach of naval aircraft. These regulations formalize, for the first time, the degree of error permissible with GCA to insure a safe approach under restricted visibility.

A "waveoff" will be given to naval aircraft on GCA approach: when the plane drops down 20 ft. below the glide path at a distance of one-half mile, 50 ft. below at one mile and 75 ft. two miles out.

When the plane drifts 200 ft. to the left or right of the glide path one mile out or 400 ft. at a distance of two miles.

Pilot may wave himself off at any time that no instructions are received for a period of five seconds or more.

When the position of the incoming plane is in doubt or there is any suspicion of GCA malfunctioning.

All "waveoffs" are mandatory.

runway length of 3800 ft. for take-off have now been upped to 3960 ft. Landing runway length required at a landing weight of 37,619 lb. has been cut from 4140 ft. to 3960 ft.

Certification of the American Airlines version was based on the 1975 hp. obtained from war surplus R-2800 engines, which failed to develop the design 2100 hp. American originally planned use of these engines until first overhaul period at which time modifications would have been made to make the engines R-2800-CA-18 with water injection. Performance restrictions on the current version has caused American to re-study its plan to determine whether the modifications should be made now on the surplus engines or new engines purchases.

► **Stall Good**—Stall characteristics of the craft have proved satisfactory with a flaps-up, power-off figure of 86.7 mph. Good stall warning has been exhibited in the more than 500 stalls obtained to date and aileron control has proved satisfactory down to the stalling speed. Single-engine stall performance exhibits a moderate wing drop and yaw easily controllable. Cabin pressure and wing tank sealing have proved dependable throughout these rugged maneuvers.

The thermal anti-icing system, served by five percent exhaust gases mixed with 95 percent air has shown satisfactory readings at all temperature points recorded and CAA certification will be asked soon. Further work on

cabin soundproofing and noise suppression of the jet ejector exhausts is planned.

A total of 178 Convair Liners is now on order plus several private owner versions.

## Miami Air Show Features Lightplanes

A pageant of aviation progress, starting with a typical county fair balloon ascension of the '90's, and including old style pusher and Curtiss Jenny planes, as well as later Ford tri-motors, Boeing 247s, and more modern transport and military planes, will be presented at the three-day Miami (Fla.) Air Maneuvers, Jan. 9, 10 and 11, at Opa Locka Master Airfield.

Main competitive event will be the Continental Motors Trophy Race for midget single seat planes with 190 cu. in. displacement engines, including many of the planes which raced in the Goodyear trophy races at Cleveland on Labor Day. The races will be in three heats over a tight two-mile course, for \$10,000 in prize money.

► **Gulf Substitutes**—Following cancellation of Gulf Oil Company's free gasoline and oil arrangement for Miami-bound private flyers this winter the Miami show management is making strong efforts to attract private flyers by other inducements not previously offered, including passes to the air maneuvers, and other free entertainment, stopover quarters available at the field at \$1 to \$3 per night, with adjacent restaurant facilities and bus schedules to downtown Miami. Flying Alligator Club of Florida is planning a pre-race rendezvous at Melbourne, with a party and initiation, a free barbecue, and "low-cost lodging" for visiting private flyers. Florida Air Pilots Association will be hosts to flyers at Miami.

Exhibition flying by Beverly Howard, Charleston, S. C., international Aerobatic champion; Woody Edmondson, Lynchburg, Va., Betty Skelton, Tampa woman stunt pilot; the Flying Allens, of Batavia, N. Y., and other acts are planned.

## Uncertified Lines Served With Injunctions

Injunctions restraining two uncertified airlines from flying passengers to foreign points on a common carrier basis have been obtained in federal courts by the Civil Aeronautics Board.

Winged Cargo, Inc., Philadelphia, consented to an injunction against operating common carrier passenger services to foreign areas, and in addition agreed not to conduct any flights on other than an irregular basis. CAB's move was di-



### ALL METAL ASSAULT GLIDER

First picture of the CG-18A (Avitruc) all metal glider built for the Air Force by Chase Aircraft Co., Trenton, N. J. The Avitruc is larger than its military predecessors and features many safety devices for the protection of crew and passengers. Loading is facilitated by a truck-bed height loading door. Cargo ramp lowers to ground to provide easy access for wheeled vehicles. For towed takeoffs a C-47, C-82, or C-46 are the most likely tugs as all three are still in use by the Air Force. Span is 86 ft. 4 in.; length is 53 ft. 5 in.; height is 19 ft. 10 in.; and gross weight is 15,500 lb.

rected against Winged Cargo's DC-3 service to Nassau, Bahama Islands, and against the company's operations to San Juan, P.R. (AVIATION WEEK, Dec. 15).

A temporary injunction against Ocean Air Tradeways, Glen Cove, N. Y., restrains that company from carrying passengers in foreign air transportation. The line has been making C-54 flights to Europe. CAB on Sept. 10 withdrew the exemption which permitted nonscheduled passenger-carrying flights to foreign points.

## SWA Uses Four Aids For All-Weather Landing

First commercial use of an integrated four-phase all-weather landing system was made Dec. 14 by Southwest Airways at perhaps the nation's foggiest airport—Dows Prairie at Arcata/Eureka, Calif.

Immediately prior to the approach of the SWA DC-3 (bound from San Francisco to Medford, Ore.), visibility along the runway was restricted to ½ mile by fog which began at 100 ft. The Southwest pilot used GCA and SCS-1 ILS to make his letdown. High intensity lights along the last 3,000 ft. of approach and entire 6,000 ft. of runway were used to give the pilot visual guidance, and Fido burners placed along the last 1,000 ft. of approach and the first 2,400 ft. of runway evaporated the fog during the landing.

Following shutdown of Fido, visibility again was reduced to ½ mile with a 100 ft. ceiling. Three of Southwest's four flights through Arcata used Fido and other aids on Dec. 14. T. R. Mitchell, SWA operations manager, predicts the carrier will now operate into Arcata 95 percent of the time. Previously, fog had prohibited landings at the field being made during a large part of the year.

## Congressional Air Group Plans January Hearings

The joint Air Policy Board's four subcommittees—on combat aviation, manufacturing, transportation, and government organization—plan open hearings, starting mid-January. Hearings before the combat aviation subcommittee, headed by Rep. Carl Hinshaw (R., Calif.) are scheduled to get underway first.

Several new appointments were announced by the Board's chairman, Sen. Owen Brewster (R., Me.), last week:

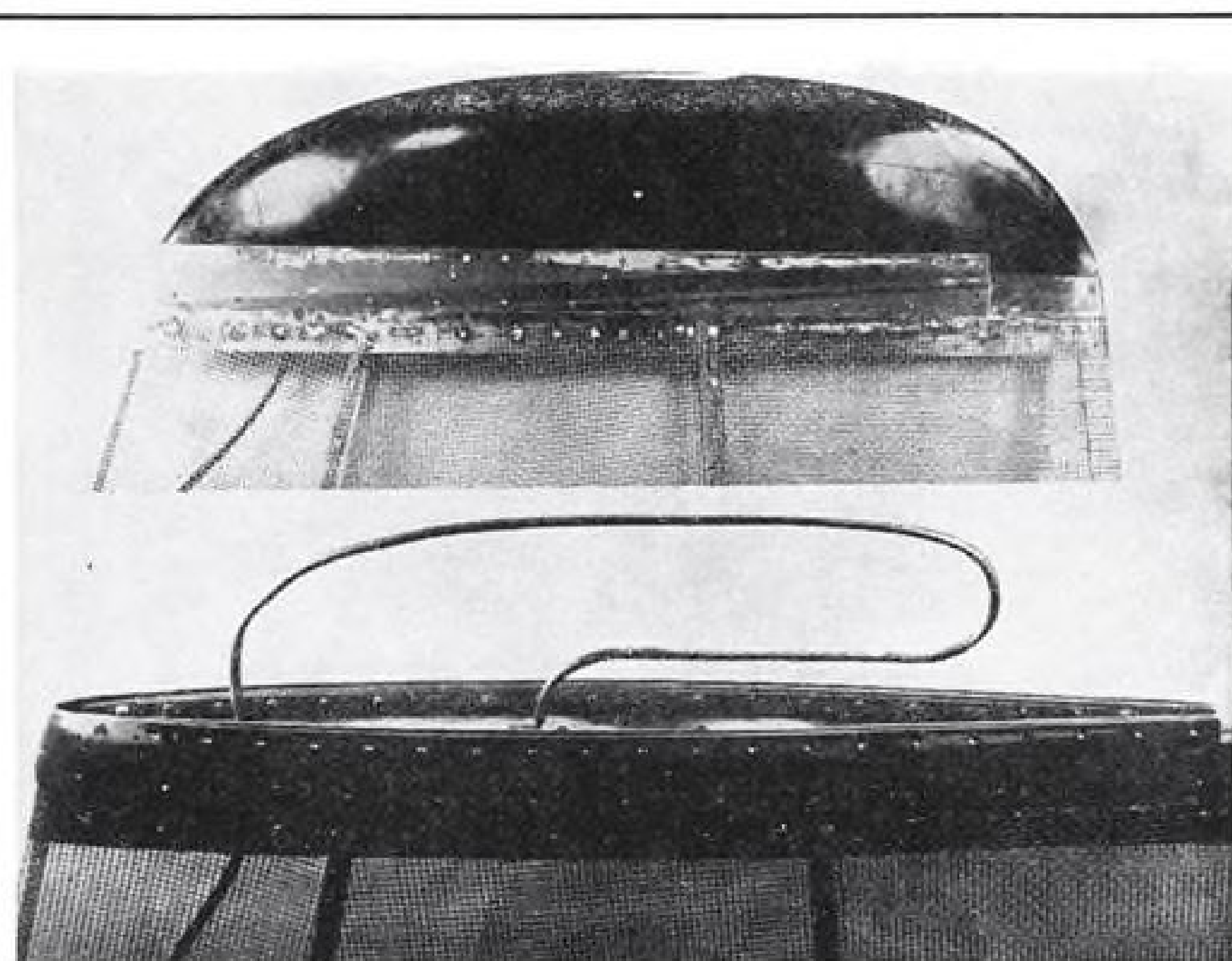
• **D. W. Rentzel**, vice chairman of the radio technical commission for aeronautics, a government-industry group to formulate air communications programs, was appointed consultant. Merrill Meigs, former chief of War Production Board's aircraft division, is the board's other consultant.

• **Gerald Brophy**, TWA attorney who clashed with Brewster over the chosen instrument issue at hearings this spring, and **L. Welch Pogue**, former CAB chairman, were named to the board's advisory council, composed of 20 outstanding industry representatives.

• **Selig Altschul**, New York aviation consultant, and **A. Passen** of the Buffalo firm of aviation consultants, **Drew, Peters, Passen, and McDonald**, were designated to make special studies for the board. Altschul's study will deal with aircraft manufacturing finances, and Passen's with airline finances. Passen was formerly on the faculty of Harvard graduate school of business administration.

## Transocean Adds DC-4

Transocean Air Lines, Oakland, Cal., soon will place its 10th DC-4 in operation. The carrier currently is making two to three weekly flights to Okinawa and Guam on a sub-contract to the U. S. Army Corps of Engineers.



### SKYSTREAK ANTENNA REVEALED

First photo of antenna mounted within plastic cover atop Douglas D-558 fin reveals metal tubing loop, forward end of which is fed by coaxial cable and aft end of which is secured to structure. Actually, the loop energizes the entire upper portion of the fin, which acts as an antenna. Interior mounting of antenna produces no drag. System was developed by Airborne Instrument Laboratory especially for the D-558 installation.



## Reuther Regime Plans Air Industry Shifts

As expected from the Reuther sweep at Atlantic City, aircraft and airline management will see some new faces on the other side of the bargaining table the next time they sit down to negotiate with C.I.O.'s United Automobile, Aircraft and Agricultural Implement Workers.

Supporters of UAW-CIO President Walter P. Reuther have stepped into key jobs formerly filled by the Addes-Thomas-Leonard faction, which lost control of the union executive board last month.

Reuther himself gave up chairmanship of the aircraft department to one of two new vice presidents, John W. Livingston of St. Louis. At the same time, the aircraft staff was enlarged from two to six.

► **Aviation Replacements**—Livingston, 39-year-old former trimmer in General Motor's Fisher Body division, also replaced former President R. J. Thomas in charge of the airline mechanics activities.

He immediately announced an organizing drive against airlines and took steps to enlarge his staff, naming J. L. McFarland, president of the Airline Mechanics Association before it was absorbed by UAW-CIO, as assistant director. Other staff members are E. F. Bilger of Braniff Air Lines and William A. Ethridge of Chicago & Southern.

Livingston said he would seek improvement of existing wage contracts and "launch a vigorous organizational drive" to bring all airline mechanics under the UAW-CIO banner.

As an organizer, Livingston has quite a reputation. He started the local union at St. Louis Fisher Body plant in 1933. He led the strike for recognition in 1936, became regional director in 1942 and, within 18 months, increased UAW-CIO membership in the St. Louis region thirteen-fold.

► **Thompson Assault**—UAW-CIO's next assault on Thompson Products' Cleveland plants, which have successfully fought off a half-dozen organizing drives in the past six years, will be directed by the other new vice president, Richard Gosser of neighboring Toledo. O. Gosser has taken over the "Thompson Products Department" from Regional Director Paul Miley of Cleveland, a left-winger.

Fred Crawford, Thompson president, and his industrial relations chief, Vice President Raymond S. Livingstone, have scored some important court and National Labor Relations Board victories over the UAW-CIO. Gosser will find them waiting and ready to take him on as they have his predecessors.

## INDUSTRY OBSERVER

► Air Force will shortly release specifications to the industry on a new combat trainer designed to replace the AT-6 in the pilot training program. Combat trainer will be a high performance single engine airplane equipped for gunnery, rocketry and bombing and will make for a smoother transition to tactical training in jet combat types.

► British Overseas Airways will conduct mid-air refueling tests over Gander this winter. Only all cargo and mail liberator flights will be used in the tests. No passenger flights will be involved. Purpose of the tests is to supplement the fair weather tests over Bermuda with operational data on the system in the foul weather characteristic of the North Atlantic.

► British refueling tests are significant in view of the increasing dependence on the DH 106, four jet airliner, to put British equipment back into the running on the highly competitive North Atlantic run, now dominated by American transports. The DH 106 will require mid-air fueling to make the London-New York or Montreal run nonstop.

► Other British long range transport projects—the giant Brabazon land plane and the Saro flying boats are facing increasing difficulties. Brabazon can use only one airport in the world—its home field at Bristol. Saro boats are now seriously overweight although not yet completed.

► Navy has revealed that four men lived for 30 days in a test chamber at reduced pressure to simulate high altitude. The tests were carried out by the Pensacola School of Aviation Medicine and Research to define the human tolerances to cabin pressurization imposed by oxygen want.

► Navy has installed new pilot seats capable of withstanding 40G in all current fighter and attack planes now in use and has made the new seat design mandatory in all new fighter and attack designs.

► Cornell Aeronautical Laboratory in Buffalo has developed a method of generating man-made fog by jet-propelled aircraft that can obscure an entire array of vessels in less than 30 seconds. Equipment is so simply designed that it can be installed or removed in less time than it takes to normally ready an aircraft for flight. Controls are located at the pilot's finger tips. It is a Navy project.

► Watch for a deal between Northrop Aircraft Inc. and Armstrong-Whitworth on Northrop's flying wing designs. The British firm has been experimenting with its own flying wing designs and recently flew its AW-52 jet tailless research aircraft approximately three weeks after Northrop successfully flew the eight jet YB-49, flying wing bomber.

► Both Air Force and Navy are having troubles with conventional bomb shapes and high speed aircraft. Poor aerodynamic shape of most bombs causes them to tumble, shed fins, and detonate from the violence of their gyrations when released from planes travelling 600 mph. Navy is working on a streamlined casing for ordinary bombs, napalm tanks and rockets.

► Royal Air Force fighter command will probably accept an invitation to exhibit the latest British jet fighters at the National Air Races next September. Whether the RAF jets will race against American fighters in the Allison and Thompson jet races has not yet been determined. So far the U. S. Air Force has been reluctant to approve international jet competition.

► Vought F6U Pirate has passed flight tests at Naval Air Station Patuxent with streamlined wing tip tanks.

► Navy has accepted the Bell HTL-1 trainer helicopter and Sikorsky XHJS-1 utility helicopter for preliminary flight test.

## FINANCIAL

### Airline Financing Need Continues As Replacement Problem Grows

Capital needs for next 12-18 months estimated at \$250-300 million; some depreciation reserves dissipated to carry operating deficits.

The need for additional airline financing continues to grow in intensity. Captain Eddie Rickenbacker recently declared that the industry would require a capital investment of \$10 billion during the course of the next ten years. Our own estimates place the more immediate capital needs over the course of the next 12 to 19 months from \$250 to \$300 million. The magnitude of these new funds is more fully appreciated when it is realized that the total assets of the domestic air carriers approximate less than \$450 million at present.

With airline fortunes at low ebb, new financing becomes a very difficult process. Moreover, in a number of instances, there is a pressing need for equipment replacement. Maintenance of competitive positions require the utilization of newer and more modern transports. An important corollary is the reduced operating costs and increased efficiencies attendant with new equipment. This replacement becomes a vicious problem as depreciation reserves accumulated over a period of years are incapable of financing the purchase of new planes. In many cases, such reserves have been dissipated to carry operating deficits. Of greater impact is the present high cost of new transports as contracted with the types replaced. For example, at their inception a DC-3 complete could be purchased for around \$125,000. The current cost of the 2-0-2, on the other hand, is about \$300,000. The introduction of the very largest de luxe equipment into commercial service involves staggering capital outlays. For example, the new Boeing Stratocruiser is estimated to cost in the vicinity of \$1,500,000.

► **Measures Taken**—In the meantime, the airlines are attempting all possible measures to shore up deteriorating financial positions. Increased passenger fares and the drive for more mail pay are manifestations of this effort.

The air carriers also are utilizing every known technical accounting device to minimize losses and maintain credit ratings wherever possible. An outstand-

ing example of the points in question is provided by United Air Lines.

Recently this company, prior to the issuance of its annual report, made the unusual announcement that it was transferring \$2,000,000 from its depreciation reserve to earned surplus. The premise of this action is sound and in keeping with the stated reason that the DC-4s are now found to have a useful life well beyond Dec. 31, 1947, at which date they would have been almost completely depreciated on the books. United could have added also that back in 1945 it transferred to depreciation reserves the total of \$2,500,000 representing the then existing reserve for postwar adjustments. This was done to offset the possible obsolescence that might have reduced the estimated four-year service life of the used DC 4s acquired from the government. The grounding of the DC-6s and the delay of new type transports now removes the threat of the premature obsolescence of the DC-4s. Nevertheless, this was a factor that could not have been foreseen by management two years ago.

► **Transfer Significance**—The significance of the current transfer to surplus and the timing of the announcement must be related to United's technical ability to maintain dividends on its recently issued preferred stock. As of Sept. 30, 1947, United showed an earned surplus of \$2,453,001. The company estimated a loss of \$3,076,000 for the fourth quarter of this year. This would have created a deficit surplus account for the carrier. The next preferred dividend is payable March 1, 1948. The company's cash position would not preclude such a disbursement at that time. However, in addition, to the legal question, no sound management would declare any dividends unless an earned surplus existed, particularly when there are senior debts in the form of debentures and bank loans outstanding. It would appear, therefore, that the restoration of \$2,000,000 to earned surplus at this time may facilitate the next preferred dividend payment to say nothing of bolstering the

morale of the stockholders who see the market price of their senior equity bouncing into new low ground.

Should United omit the dividend on its preferred stock early next year, the credit standing of the company would be severely damaged. This preferred stock was issued in January, 1947, and thus far has maintained all dividends when due. The continuity of such payments is very important to the credit of the company. United is faced with an additional financing problem when it embarks upon a replacement program for its DC-3s. It is highly possible that more preferred stock may be offered. An unbroken dividend record is essential to the successful marketing of these shares at levels previously obtained for the existing series.

► **American Practice**—American Airlines, in footnotes to its quarterly statements issued thus far this year, reveals an accounting practice designed to minimize current losses. For the nine months ended Sept. 30, 1947, the company deferred \$1,430,000 representing interest paid on debentures used for financing acquisition of equipment and facilities, and expense incurred in training of personnel for operation of DC-6 planes. The interest is being capitalized as the equipment is placed in service and the training expenses are being amortized over a four year period. This is all quite permissible under the CAB's Uniform System of Accounts and sanctioned by competent accounting authorities. However, during normal periods of sustained earnings, it is probable that more conservative practices would have prevailed and instead of being deferred, the sums involved would have been charged to current earnings.

All these accounting devices, in themselves, create no additional funds for the carrier. If anything, they merely postpone the day when they must be reckoned with in current accounts.

There has been no major public airline financing since Northwest obtained some \$27,000,000 through the sale of preferred stock and a revolving bank credit in April of this year. None of this \$18 million bank credit, as yet, has been reported drawn down by the company.

In viewing the various financing problems of the airlines, it appears that far too much attention is focused on the symptoms rather than the cause. Adequate new capital will be forthcoming to the industry just as rapidly as earning power is restored to the individual companies. It therefore becomes far more important to marshall all the elements in line contributing to such earnings than to be diverted by temporary expedients which are of no lasting import.

Selig Altschul



## Chance Vought Move To Texas Pending Under Navy Agreement

Firm negotiating one-year lease on former North American plant with planned employment of 8,000 indicating large order for Pirate jet fighter.

By WILLIAM KROGER

Chance Vought Aircraft division of United Aircraft Corp. will move its entire operation to the former North American Aviation Plant B at Grand Prairie, Tex., if negotiations under way early this month between the company, the Navy and the Dallas Chamber of Commerce are successfully culminated.

An agreement under which Chance Vought would lease the 1,368,700 sq. ft. plant from the Navy for one year was near at press time and announcement was expected before the year-end.

According to the statement of the Dallas Chamber of Commerce, Chance Vought would employ approximately 8,000 people at the plant in the production of "jet fighters." This would indicate that the company has received, or is about to receive a large order from

the Navy for F6U-1 Pirate fighters. The only figure heretofore mentioned for CV's production of this plane was 20. The number of employees contemplated, however, points to a far larger quantity.

► **Year to Transfer**—If the deal goes through, CV would continue only its F4U-5 production at the present plant at Stratford, Conn. When this contract is concluded it is presumed that the Stratford plant will be closed. Meanwhile, the moving of the remainder of the CV operation would begin and it is estimated that it will require a year for the transfer to be completed. It is indicated that CV general manager Rex B. Beisel will make his headquarters at the Texas plant.

The move, if it goes through as pres-

ently envisioned, will break up the tight concentration of United Aircraft interests in Connecticut for the first time, except during the war, since the corporation was organized in its present form and ended its connection with the Boeing operation after the airmail investigation which took place in the early 'thirties.

The North American factory, near Dallas, was built by the Government during the war for production of B-25s, P-51s, AT-6s and SNJs. Since the end of the war it has been turned over to the Navy and designated a stand-by plant, to be kept in reserve for an emergency with its aeronautical productive features intact. It consists of two plants, the smaller of which, plant A, is occupied under a five-year lease by Texas Engineering & Manufacturing Co. and used for production of the Swift 125, modification and overhaul work, and manufacturing of products of a non-aviation nature.

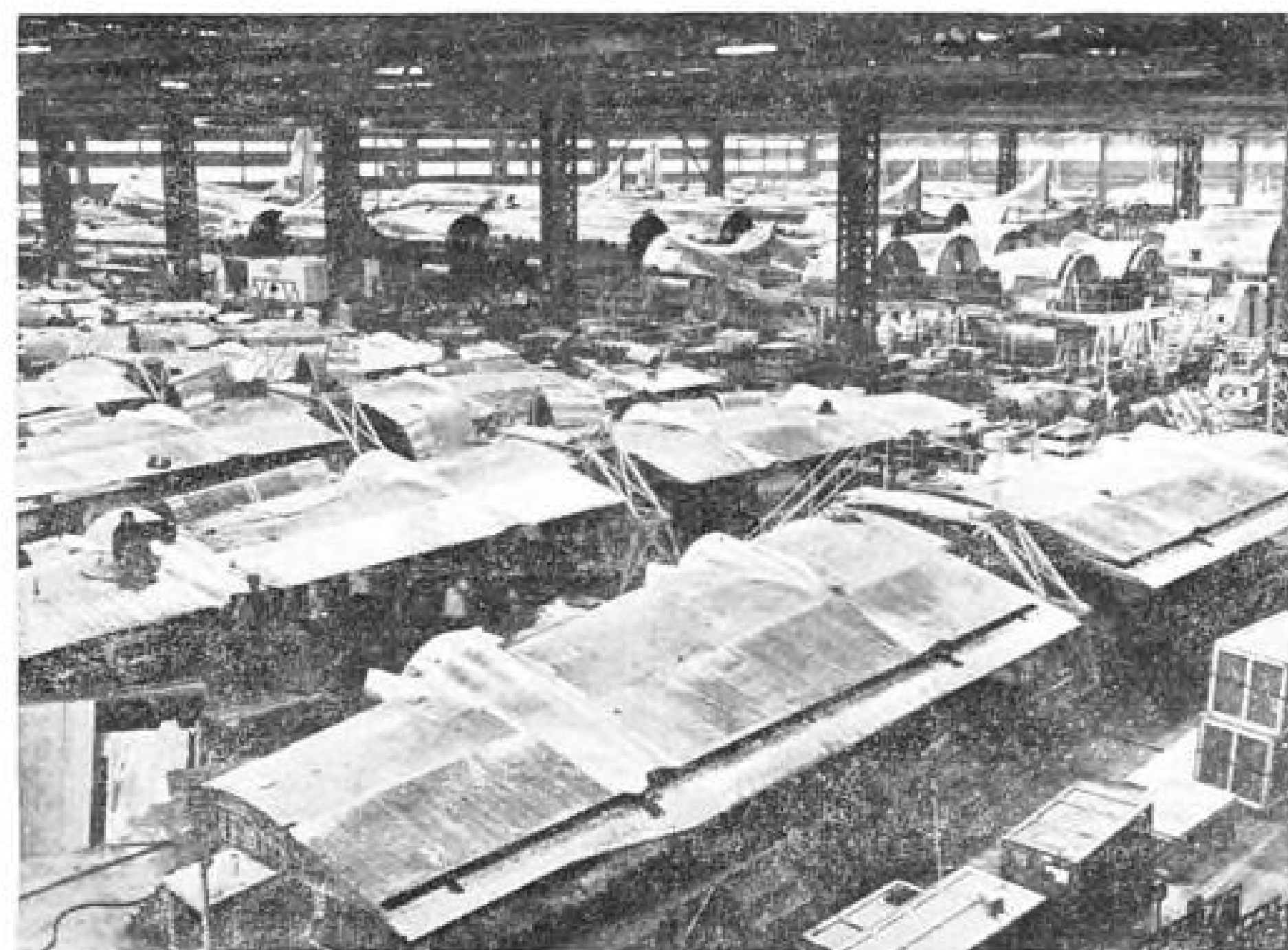
The larger section of the establishment, plant B, to be leased by Chance Vought, has a high bay area 200 ft. by 1,150 ft., well suited for an assembly-line operation.

The two plants combined cover approximately 272 acres and adjoin Hensley Field, which is now owned by the city of Dallas. The city has already agreed to spend \$256,000 to add 2,000 ft. to the northeast-southwest runway to make it suitable for the operation of jet planes.

► **Inspired by Industrial Preparedness**—Glenn L. Martin Co. recently stated that it was one of "the companies" the Navy requested to inspect the former North American facility, an indication that the impetus for the CV move came from the Navy, possibly in line with long-range industrial preparedness considerations. Both the Air Force and the Navy, in addition to a desire to reactivate the stand-by plants, have long had a quiet belief that the aircraft manufacturing industry should be "decentralized"—or at least that the present heavy concentration in several areas should be broken up.

Until the CV move is firm, the only notable large-company transfer from a concentrated area was that of Curtiss-Wright from Buffalo to its wartime plant in Columbus.

The CV move, however, would add to an aircraft manufacturing complex already established in the Southwest, with TEMCO at Grand Prairie, Luscombe at Dallas and Consolidated Vultee at Fort Worth.



**SMOOTH EVEN FLOW OF BOEING PRODUCTION**

Semblance of wartime production activity at Boeing Aircraft Co. is shown here along the final assembly line at the Seattle plant. Crowding the floor are (foreground) wing subassemblies, (center) Army and commercial Stratocruisers, and (background) B-50 bombers. At far left is final assembly of a Stratofreighter for U. S. Air Force.

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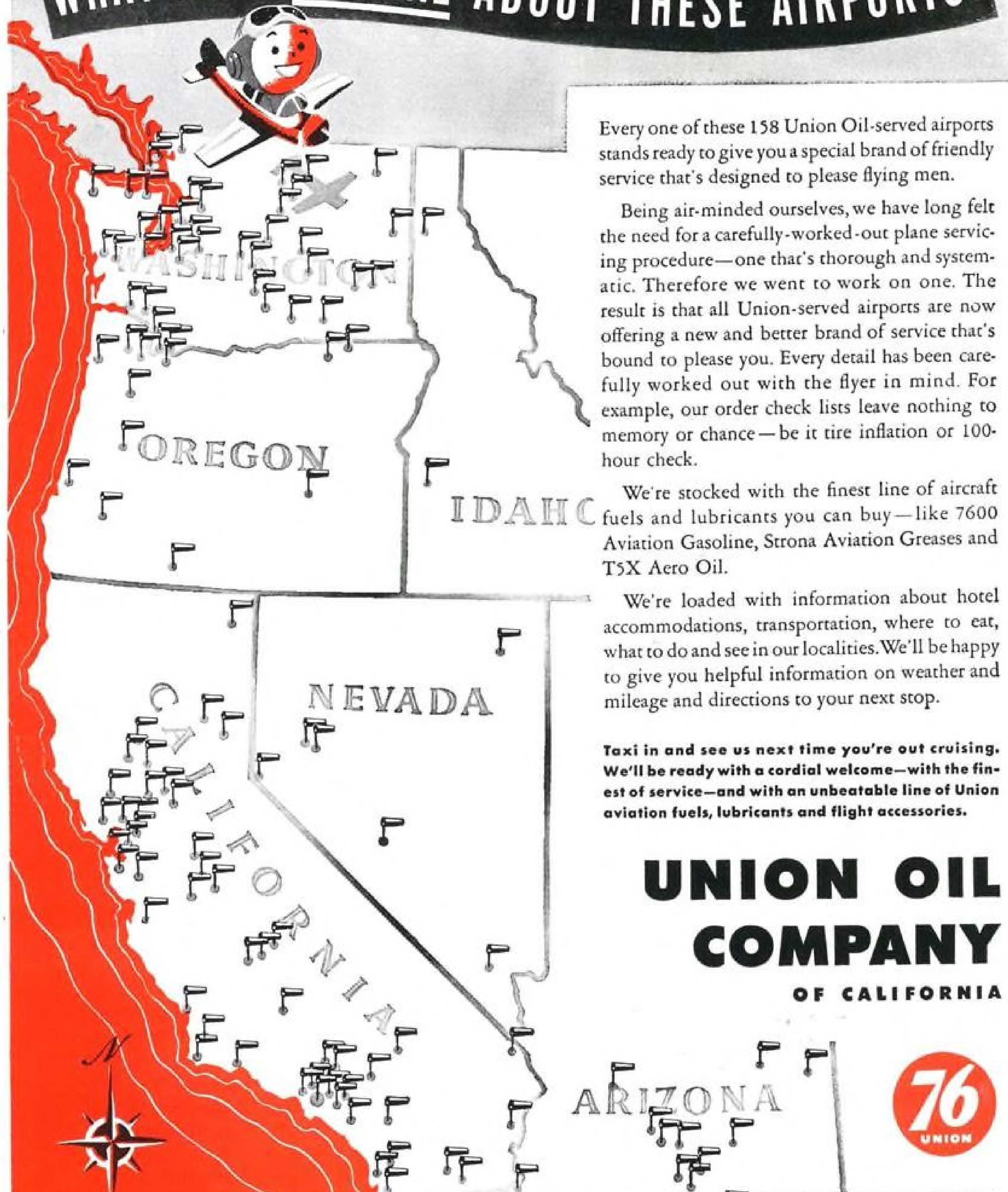
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**IDAHO**—Boise, Coeur d'Alene (2).

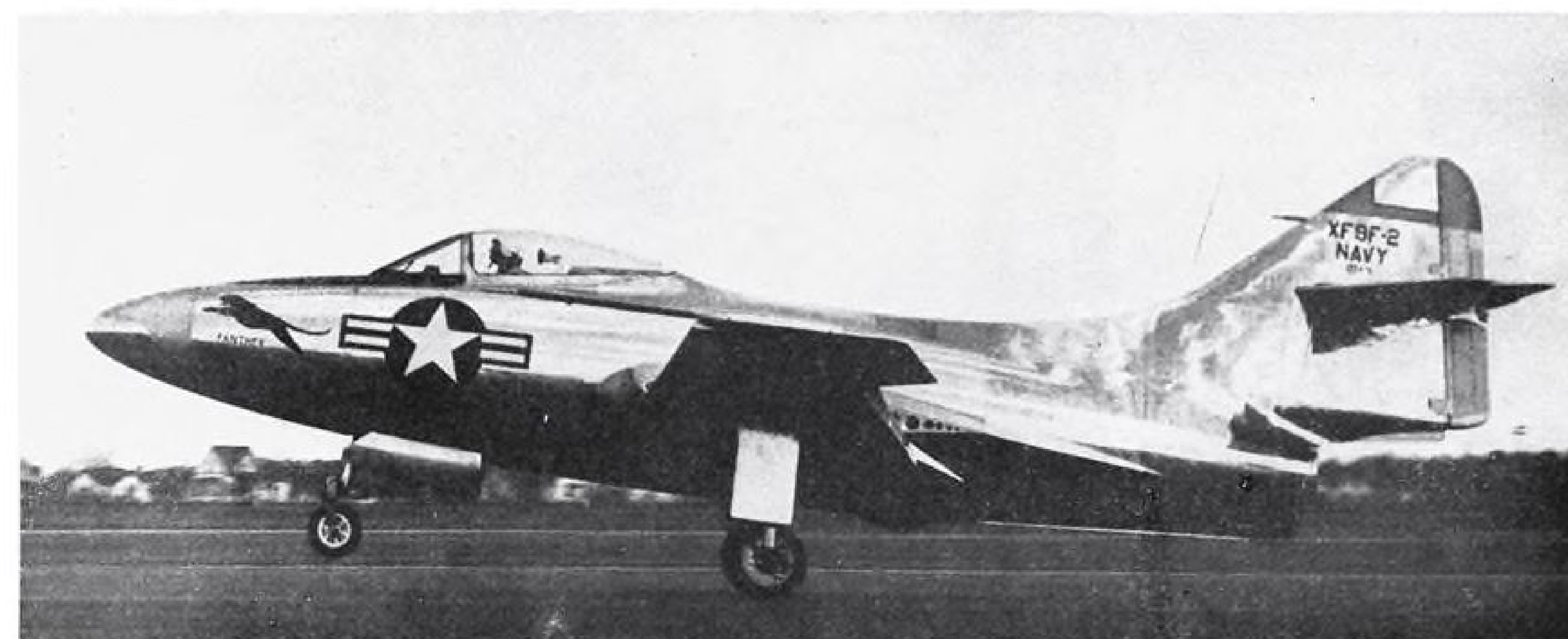
**WASHINGTON**—Auburn, Bellevue, Bellingham, Bremerton, Camas, Chelan (2), Cle Elum, Colville, Ellensburg, Enumclaw, Everett, Forks, Friday Harbor, Hoquiam, Kennewick, Lacrosse, Longview (2), Montesano, Omak-Malott, Orcas

Island, Olympia, Port Angeles, Port Orchard, Prosser, Puyallup, Renton, Seattle (5), Sequim, Shelton, Snohomish, Spokane (3), Tacoma (3), Toppenish, Twisp, Vancouver, Washouka, Woodland, Wenatchee, Yakima (2).

**HAWAII**—Honolulu.

**ALASKA**—Anchorage (2), Fairbanks (2), Juneau (2).

## NEW AIRCRAFT



### Navy's XF9F Jet Fighter

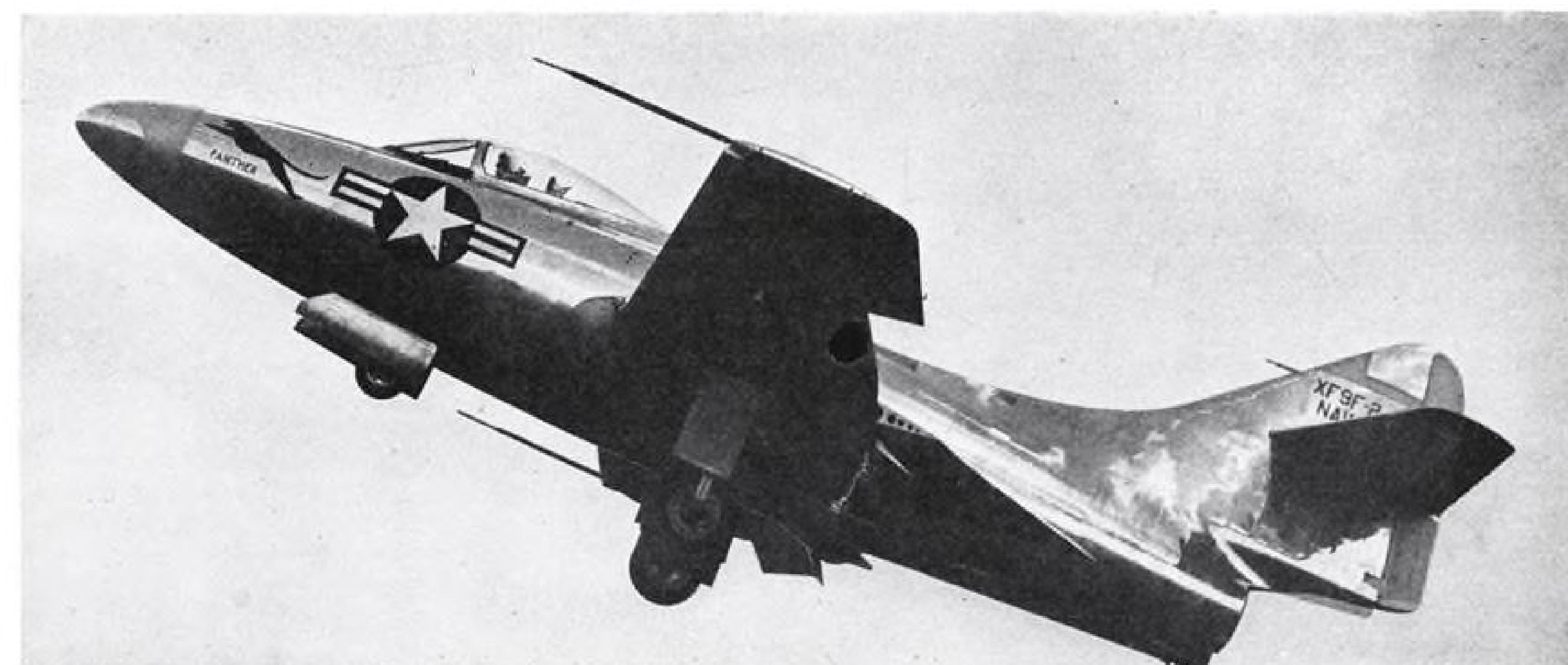
XF9F-2, Grumman Navy shipboard fighter using British built Rolls-Royce Nene turbojet, has extremely short tailpipe to eliminate pumping losses inherent in longer pipe models. Wing flap configuration, shown in the accompanying photos, make landing speeds of 80-85 mph. possible. The extremely long, thin pitot tubes ensure accurate airspeed readings by measuring pressures in areas of relatively undisturbed air.

Landing gear, on retractions into fuselage, is completely covered by metal panels producing clean aerodynamic lines with low drag characteristics needed for high speed flight.

Horizontal stabilizer has been moved upward into its present rather unconventional position to keep it out of the jet exhaust which produced buffeting and heat damage when conventional placement was used.

Slow landing speeds and fast takeoff together with exceptional climb capabilities make the Panther ideal for carrier use. The performance of this plane is said to be equal to most reciprocating engine powered fighters and superior to many.

(Photos by Ross-Pix)







# Bristol Helicopter Aims at New Performance Goals

By IRVING STONE

Detailed study by U. S. rotorcraft designers of information now available on the Bristol 171—first helicopter built by the British for commercial applications—indicates that serious thought has been given to achieving performance objectives differing from those achieved by American machines.

This is apparent in a number of fundamental points in the 171, most noteworthy of which is the high tip-speed at which the rotor blades operate. With a takeoff rpm. of 287, the 47-ft. 5-in. dia. rotor would give a tip-speed of 709 ft./sec. Assuming that high speed or cruising speed will be obtained at a rotor rpm. of 240 (corresponding to 2,050 engine rpm.), the tip-speed is still high—of the order of 600 ft./sec. While this tip-speed is similar to that reported used by some American machines, the takeoff tip-speed of over 700 ft./sec. will, it is believed, very seriously penalize the takeoff and hovering performance of the Bristol 171.

► **Benefits of High Tip-Speed**—Advantages expected for the high tip-speed are twofold. First, is a safety feature permitting greater time to go from high helicopter pitch to autorotational pitch with no loss of rotor rpm. below that required for autorotation; and the storing of kinetic energy in the rotor which, in event of engine failure below approximately 300 ft., will permit less hazardous landing through parachuting on the rotor with a compromise blade pitch, or making a flared autogyro landing.

The other desirable feature is that at

a given forward speed there will be a very considerable reduction of tendency to blade tip stall which was one of the limitations in high speed of some earlier American 'copters.

► **Horizontal Tail**—A small horizontal tail surface is used on the Bristol 171. Some American 'copters have used lately a small amount of horizontal tail area which, it is understood, is for the improvement of longitudinal stability at high speeds. From the apparent size of the Bristol's horizontal tail surface, and also from its appearance as a good airfoil contour, it may be assumed that longitudinal stability of this craft at high speed would be good.

► **Blade Considerations**—The Bristol's rotor blade construction is all wood for the lifting portion of the blade. Apparently, considerable care has been exercised in choice of an airfoil with small pitching moment, location of aerodynamic center and chordwise C.G. so that the aerodynamic torsional moments are practically reduced to zero. This is in line with American practice, which on the more successful 'copters has paid great attention to choice of airfoil, and having the chordwise C.G., aerodynamic center, and elastic axis all coincident.

► **Background Factors**—Obviously, a considerable amount of Cierva autogyro background has contributed to this design. Also, to engineers who have examined the Hafner AR-III Gyroplane, seen it fly, and followed the description of this craft in the British aeronautical magazines of early 1937, the design details of hub and control of the Bristol 171 look quite familiar and show un-

mistakably the work of Raoul Hafner, Bristol's chief 'copter designer.

► **General Design Features**—According to design data recently published in the British magazine *Flight*, the 171 has its physical makeup centered in a tubular-strut cage. This installation encloses engine and transmission, carries the rotor hub, and affords anchorage for boom and cabin.

• **Engine Details**—Prototype's power plant is a P&W Wasp Junior (450 bhp. for takeoff). Subsequent models are scheduled to be powered with the horizontally mounted Alvis Leonides engine.

Powerplant is carried on six-point semi-circular mounting on underside of rear crankcase, with bracing struts joining at two major rubber-bushed pick-up points on horizontal cross-tube of a lateral truss tied to the cage. On forward side of engine, support is via two radius struts, one on each side of the gearbox, bolted to crankcase nose.

Engine is closed-cowled around the cylinder heads, and cowling extends forward to shroud the cooling fan mounted close to the firewall. Air intake is through a vent forward of the pylon. After passage across cylinders, air is discharged to atmosphere through a ventral grill. Carburetor air inlet is through twin ducts in the base of the cowling, running from the cold side back to a mixing box under the up-draught carburetor on rear of engine. Hot-air intake to carburetor delivers to the mixing box from aft side of engine.

• **Transmission** from crankshaft to rotor hub includes a centrifugal clutch and two sets of reduction gears. First-stage

reduction is in the bevel gearing on engine forward side; second reduction is made through spur gearing beneath rotor. Drive from crankshaft is by extension shaft direct to the centrifugal clutch driving member, this being the hubplate of the cooling fan. On rear face of the plate is the clutch surface, the transmitting pad ring of the clutch registering between this and a backing annulus peripherally serrated to the rim of fan hubplate.

Ten flyweights are pivoted on the hubplate and under centrifugal force compress the backing annulus, clutch-pad, and hubplate to give solid drive at about 1,100 rpm. engine speed. Clutch pad is carried on a plate hub-serrated to a coaxial sleeve surrounding the crankshaft extension. This sleeve runs back to a bevel pinion meshing with a bell-type bevel crown-wheel. Crown bevel is hub-serrated to a vertical drive shaft around which are pivoted the toggle-action wedging-levers carrying the slippers forming the freewheel device.

Drive is transmitted through the toggle-levers and slippers to an enclosing bell sleeve running in a large-diameter ball-type steady bearing in the gearbox head, and externally serrated to mesh both with the driving member of rotor brake and driving member of a flexible coupling. Driven member of the latter is the base of the main transmission shaft. Crown part of gearbox cover carries the rotorbrake shoe-anchorage. Brake is a normal car-type expanding unit with twin cam-spread shoes.

Main transmission shaft is 2 3/4-in.-dia. 8-gage steel tube, terminating at the

U. S. engineers note important variations from American design in first British utility 'copter.

head with another coupling to give drive direct to the spur pinion of upper reduction gear. Base of the enclosing gearbox is bolted, together with rotor support cone, to the boss of the mounting pylon. In upper section of the gearbox is a roller bearing with rotating inner casing shell, this being bolted to the underside of the spur wheel is a low-angle bevel-annulus meshing with a bevel pinion for transmitting drive to the tail rotor shaft. The inner shell casing is axially bolted to the base of the rotor hub-forging in which the blades are pivoted.

Rotor loads are transmitted down to the pylon and thus to the airframe by the rotor support cone, the only loads carried by the gearbox casing being tooth reactions.

► **Blade, Pitch-Change Details**—As disclosed in the British magazine *The Aeroplane*, rotor blades have compressed-wood leading-edge spar with spruce ribs and a protected ply covering. Root fitting consists of five steel

plates inserted between spar laminations and bolted through, three of plates being at the top and two at bottom, picking up the tubular-steel blade root connecting the blades to the hub. By removing one of the attachment bolts the blades can readily be folded.

Blade root portion is a double steel tube, the inner being located in two plain ball bearings taking journal loads only and no thrust. Blade-root plate fittings are attached to outer tube. Through the inner tube is a tie-rod attached to the inner end of the inner tube. In this way, all centrifugal loading from the blade is taken by this tie-rod suspension.

Blade pitch-change movement, and as a result, movement of the outer tube is not transmitted to the inner tube because of the tie-rod flexibility. By this method, frictional forces during pitch changing are reduced to a minimum, the journal ball bearings producing the only friction present.

Other than centrifugal and aerodynamic twisting moments, the only opposing force to pitch-change movement is that offered by the tie-rod torsion. Aerodynamic twisting moment (ATM) has deliberately been made zero under all normal conditions of operation. This is considered very important, because a large ATM would mean very severe loads transmitted to pilot's control, and an unequal ATM distribution between blades would mean severe cyclic movement of the control lever.

Zero ATM is obtained by arranging the blade pitch-change axis to be along the line of the aerodynamic centers of

## DIMENSIONS OF BRISTOL

Main rotor dia. ....	47 ft. 5 in.
Tail rotor dia. ....	9 ft. 7.3 in.
Track .....	9 ft.
Wheelbase .....	8 ft. 6 in.
Overall height .....	11 ft. 8 in.
Overall length .....	45 ft. 6 in.
Overall width (rotor folded) .....	9 ft. 8 in.



the aerofoil sections. Also the sections have been chosen to give a zero-moment coefficient about this axis. To offset manufacturing errors in the airfoil sections, sheet-metal tabs are provided near the blade tips.

Inner end of inner tube of the tie-rod suspension assembly is attached to rotor hub through a universal joint forming the flapping and drag hinges. Both hinges have needle-roller bearings, and drag hinge is provided with an adjustable friction damper. Each blade is connected to its neighbors by connecting rods having rubber buffers to give some elasticity and damping.

Rotor-hub is a simple steel forging with machined lugs contacting the ends of the blade links to form a flapping stop in the upward direction. In downward direction the links make contact with a ring on the hub. This ring is rubber mounted, so that the droop on all three blades simultaneously is limited to 1 deg. In flight, with normal coning angle, the whole disk may be tilted, and if only one blade makes contact, the stop can be deflected on its rubber mounting to allow that particular blade to droop as much as 5 deg. Drag stops are provided by blades contacting slots in the links.

A three-way spider, rotating with the blades, can be moved vertically or rocked in any direction. Spider is linked to the blades by three levers through ball joints. If spider is moved up or down, pitch of all blades is changed equally, but if spider is rocked, pitch of the blade passing approximately at right angles to direction of rock will be increased in one direction and decreased by an equal amount when the blade reaches a position 180 deg. from this point. This cyclic change in pitch causes rotor tilt, which is in the direction of rock.

Reason for maximum cyclic-pitch change occurring at a point not at right-

angles to direction of rock is that in level flight, the rotor is tilted in relation to line of flight, hence an upstream blade will have a smaller velocity component perpendicular to the blade, than a downstream blade. This means that the angle of attack of the upstream blade is greater than that of downstream unit, so that the minimum pitch must not occur at 90 deg. from aft position of the blade, but at a point slightly forward of this.

Main-rotor control is via three levers to the spider. Two of these are used to rock the spider and the third to move it axially. In cockpit are two corresponding pilot's control-levers, one used for collective-pitch control, the other for cyclic-pitch control. Inertia dampers are provided in cyclic-pitch control circuit to reduce any small cyclic vibrations resulting from aerodynamic unbalance of rotor. These dampers consist of a screwed sleeve which rotates a disk as the control is moved. Inertia forces of these disks are small if moved slowly (as they would be by the pilot's control), but large when moved quickly (cyclic vibration).

Mechanical linkage is provided between throttle and pitch-control circuit by cam action designed to give the best mean relation between pitch angle and throttle setting. Cam is operated by cockpit pitch-lever, which replaces the normal throttle lever. It is possible to change the datum setting of the cam so that a given pitch can be obtained at a given rpm. or vice versa. This is done by a separate speed-control lever, which does not alter the rate of change of throttle-opening with pitch.

► **Further Design Comments**—In general, the Bristol design appears to be well worked out. Mounting of the power plant with its crankshaft horizontal introduces certain problems in connection with the transmission system, although these problems have been

met and effectively handled in some previous designs. In the Bristol design the lower unit of the transmission has been compactly developed. This includes the effective combination of the clutch and cooling fan located at forward end of the lower transmission unit with a direct extension from the engine shaft. Grouping of the free wheeling unit and rotor brake with the bevel gear housing also provides for compactness. Arrangement of this unit attached to the nose of the engine would appear to be quite accessible and serviceable.

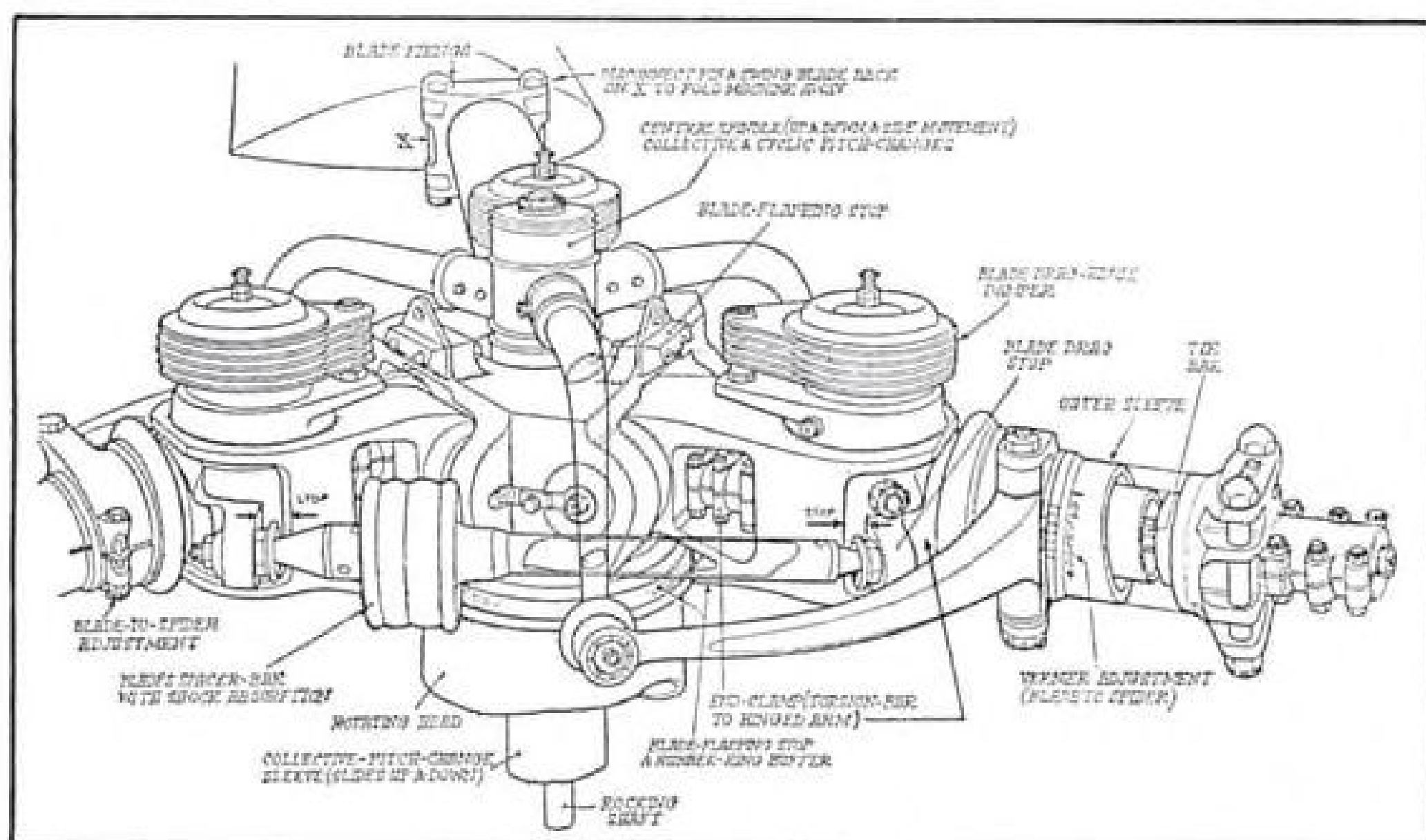
Although in a number of respects the rotor hub and associated controls resemble the design features of the Hafner Gyroplane, the present hub construction has been simplified somewhat by offsetting the flapping pivot from the axis of rotation. While the amount of flapping pivot offset has been kept the minimum which will allow a simple extension block construction, an offset of this nature has been found to be beneficial in improving stability and increasing control sensitivity.

Though the majority of 'copter designs involving drag pivot blade mounting have utilized hydraulic blade dampers, satisfactory damping characteristics by means of friction dampers such as used in the 171 have been well established (as in the Firestone 'copters). Friction dampers have also been proven reliable in service. Use of both blade to hub damping and interblade strut damping devices in the Bristol hub appears to complicate the design somewhat, and a proper application of either of these devices should suffice.

Attachment of blades by torsion rods to provide for pitch movements also follows earlier Hafner design practice. This general method of blade mounting has had considerable satisfactory operational experience in several different 'copters.

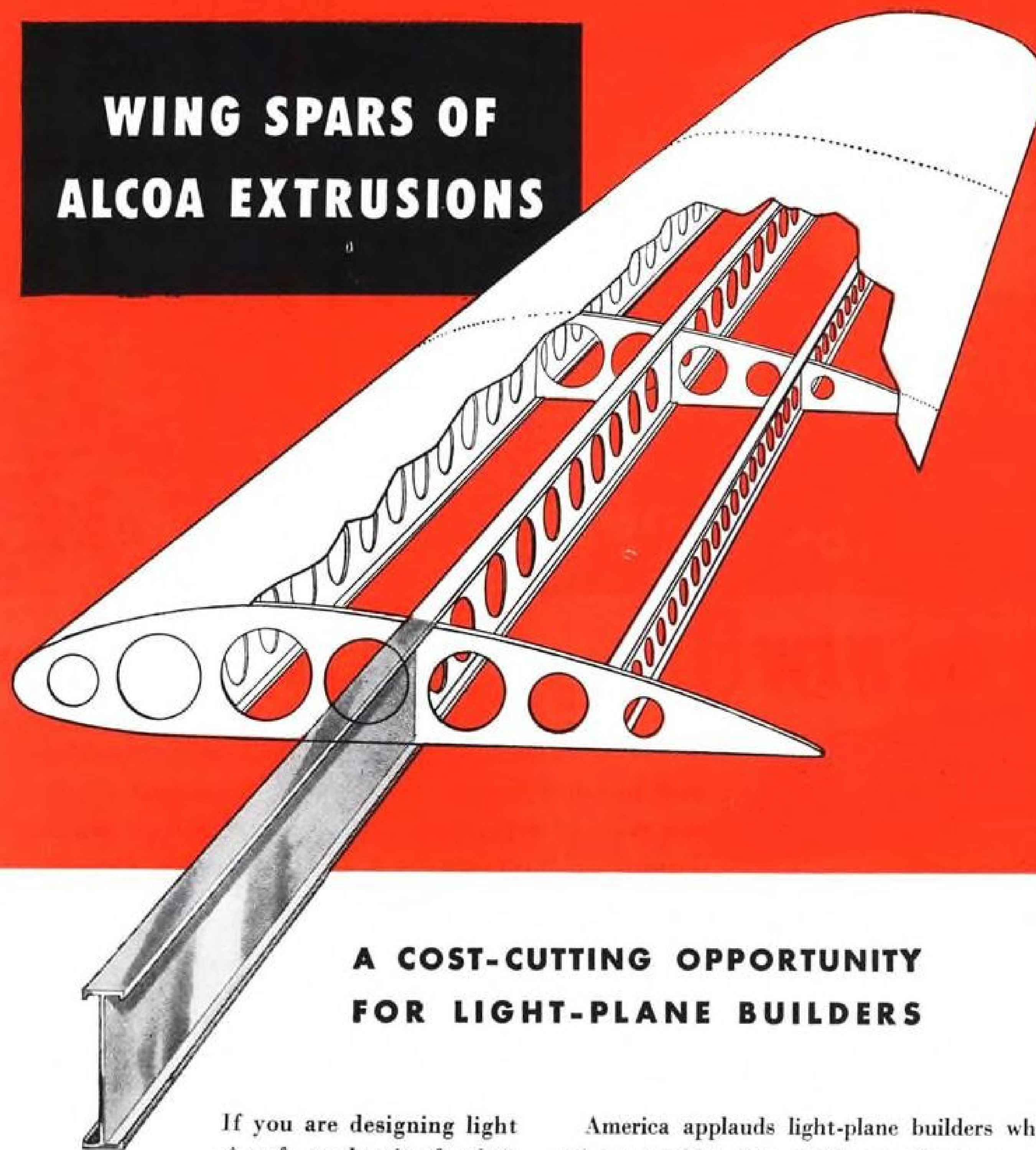
With respect to the special droop stop structure for the main rotor blades, it would seem safer to provide adequate blade droop clearance than resort to the special variable stops unless it can be established that these will handle all unusual situations, such as where one blade may be inadvertently lifted by a gust while the rotor is operating at low rpm.

Since the control system used with the hub includes a control member which passes through the central portion of the hub, this prevents use of a planetary gear reduction at this point, hence a pair of large spur gears is used. This is a simple method of obtaining the reduction and has been found quite suitable in designs where lower power was transmitted. In the present design, if rigid supports are provided, this reduction should prove quite satisfactory. A point in its favor is the relatively lower torque applied to hub as compared




Details of main rotor on Bristol 171. (Drawing from "The Aeroplane")

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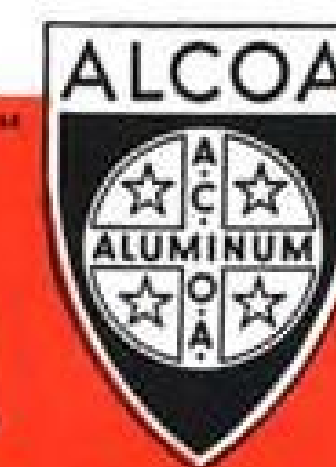
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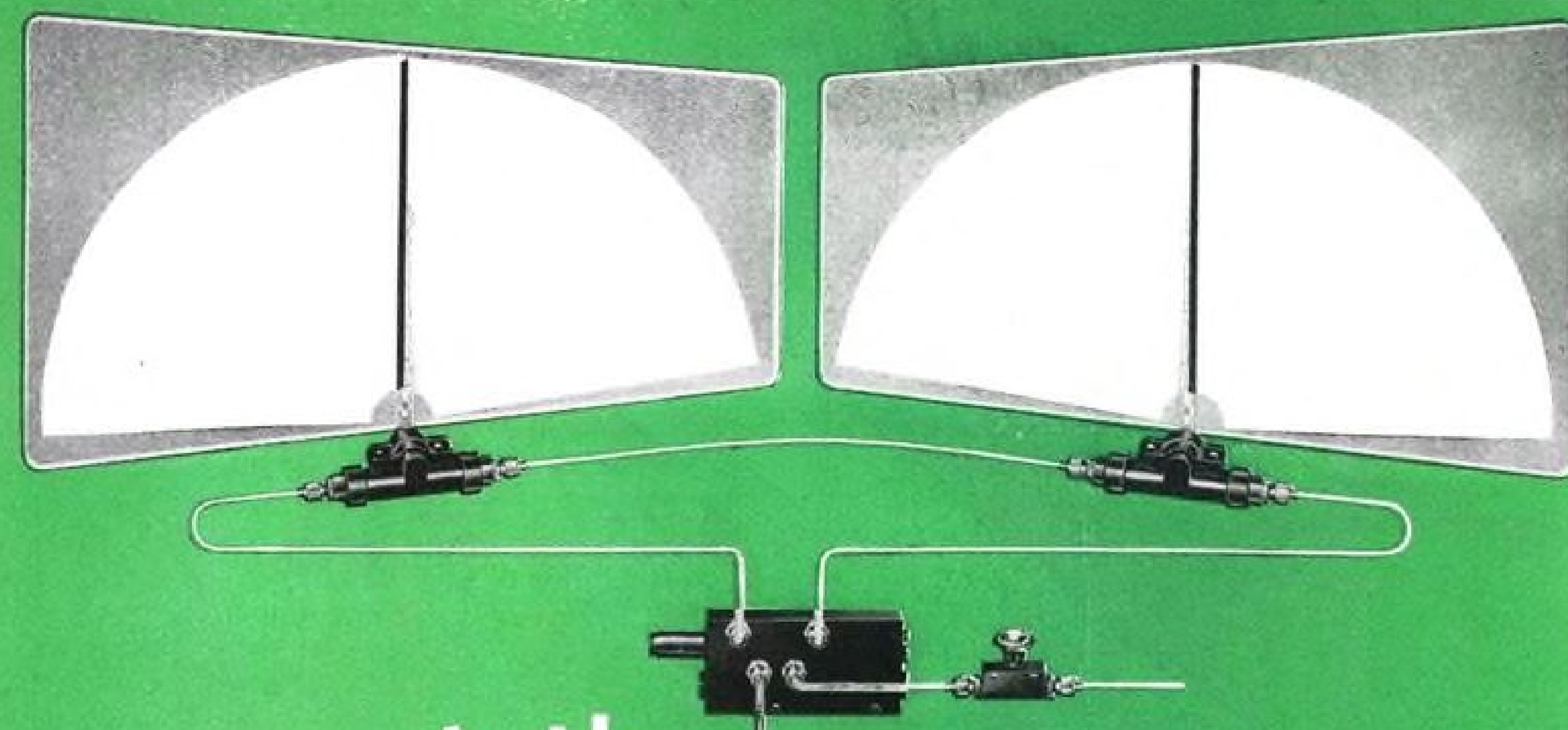
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to other single lifting rotors of this power. The lower torque is the result of the relatively higher rotor speed used. This follows Hafner Gyroplane practice using high speed rotors of low solidity.

Tail rotor drive is taken directly from the driven member of the hub through bevel gears. This involves a greater step-up in the tail rotor drive at this point than is the usual practice. It is more customary to drive the tail rotor shaft from the main transmission shaft below the final reduction to the main rotor. The Bristol tail rotor take-off construction is necessitated by the hub configuration in which the controls occupy the central space. In the tail rotor unit itself, a drag pivot is provided in addition to a flapping pivot. The more general practice involves only flapping pivots or a rocking pivot. Nevertheless, drag pivot blade construction has given satisfactory service in at least one 'copter design (Firestone GA-45).

The dual control system appears quite simple and has a minimum number of push rods. The inertia absorbers in the cyclic pitch control system should effectively prevent vibrations reaching pilot's controls. This general system for vibration prevention was used on the German Flettner controls, although the Bristol application appears simpler. Because of the possibility for some lost motion in the control system between the inertia units and the blades there may be some three per rev motion or vibration transmitted directly from the rotor to the aircraft structure.

Inclusion of a built-in fire extinguishing apparatus operative by pilot indicates the extent to which details have been considered. While this is a logical piece of equipment to include, most 'copters have omitted such refinements to save weight.

### Electrodeposit Process

Coincident with its announcement of having produced a method for satisfactory electrodeposits of tungsten alloys on metal surfaces, the Electrodeposition Section of the National Bureau of Standards (Washington 25, D. C.) has offered to cooperate with those interested in plating parts for service test.

The method is expected to find application on surfaces requiring hardness and durability at elevated temperatures, and tungsten alloys also find use in bearings, pistons, cylinders, dies, molds, and machine parts.

Of the alloys investigated, cobalt-tungsten was deposited most easily, and it is stated that in some properties it resembles Stellite.

Most interesting feature of alloys obtained by this process is their hardness, which in untreated nickel- and cobalt-tungsten materials may be between 400 and 700 on the Vickers scale.

### Research Review:

## "Droop Wing" Investigations Aid High Speed Craft Design

Wing configurations of new fighters and research planes prompted by aerodynamic effects uncovered in extensive testing at NACA.

By ROBERT McLARREN

High speed fighter and research aircraft with swept wings include an additional odd angle to their configuration—negative dihedral. These strange "droop wings" are clearly evident on the new Douglas D-558-2, Boeing XB-47, North American XP-86 and the Navy's special Bell L-39 research craft. This "cathedral" will also be prominent on the McDonnell XP-85 and XP-88 fighters and the new Air Force stable of supersonic speedsters. Underlying this new fashion in fighters is a peculiar aerodynamic effect revealed by an extensive research program of the NACA.

Dihedral is used on the conventional airplane to improve lateral stability. As the plane is rolled over into a sideslip by an asymmetrical gust, the descending wing operates at a higher angle of attack than the ascending wing, resulting in the creation of additional lift tending to restore the craft to steady level flight. Introduction of wing sweep-back has complicated this simple action by greatly increasing its effectiveness.

Effectiveness of dihedral is measured by rate-of-change of the rolling moment coefficient with the angle of sideslip. When the wing is swept back, this effective dihedral changes rapidly with a change in lift coefficient resulting in excessive dihedral effect at medium and high lift coefficients. To minimize this dihedral effect at high lift coefficients it has become necessary to use negative geometric dihedral which produces, in effect, an airplane without dihedral when flying at low lift coefficients (high speed level flight) and only the moderate angle required for high lift coefficient (low speed, landing, takeoff).

Results of these NACA tests indicate that for lift coefficients up to 0.8 the effective dihedral of a 40-deg. sweep-back increases with lift coefficient and positive geometric dihedral and decreases with negative geometric dihedral. With the wing at zero degrees dihedral, the effective dihedral reached a maximum value at a lift coefficient of 1.0, and as the dihedral was increased the maximum effective dihedral co-

efficient occurred at increasingly lower lift coefficients. With negative geometric dihedral, the maximum effective dihedral coefficient was reached at a lift coefficient beyond the maximum lift. This phenomenon results from the nature of the wing stall since, with negative geometric dihedral, the leading wing in a sideslip has a smaller angle of attack than the trailing wing, resulting in the latter stalling and a righting moment being produced on the airplane.

The tests indicate that for any lift coefficient along the straight portion of the lift curve, effective dihedral varies directly with geometric dihedral within a range of the latter from -10 to +10 deg. At higher and lower geometric dihedral angles the effective dihedral variation decreases. Within this -10 to 10 deg. range, the variation of effective dihedral with geometric dihedral prove to be about 75 percent of the value for a conventional unswept wing. For dihedral angles larger and smaller than -10 and 10 deg., changes in dihedral angle resulted in changes in effective dihedral of only about 50 percent of the value of an unswept wing.

Directional stability of the airplane, as measured by rate-of-change of yawing-moment with the angle of sideslip, increases with increasing negative dihedral and increasing lift coefficient. No appreciable increase in directional stability of the sweptback wing was noted with increasing positive dihedral.

Increasing positive dihedral created increasing nose-up pitching moments at the stall, creating instability, whereas, increasing the degree of negative dihedral resulted in increasing nose-down stabilizing moments at the stall.

As a result of these tests, the phenomena of swept wing dihedral effects were revealed and corrective action taken in the design of current fighters and research aircraft.

### REFERENCE

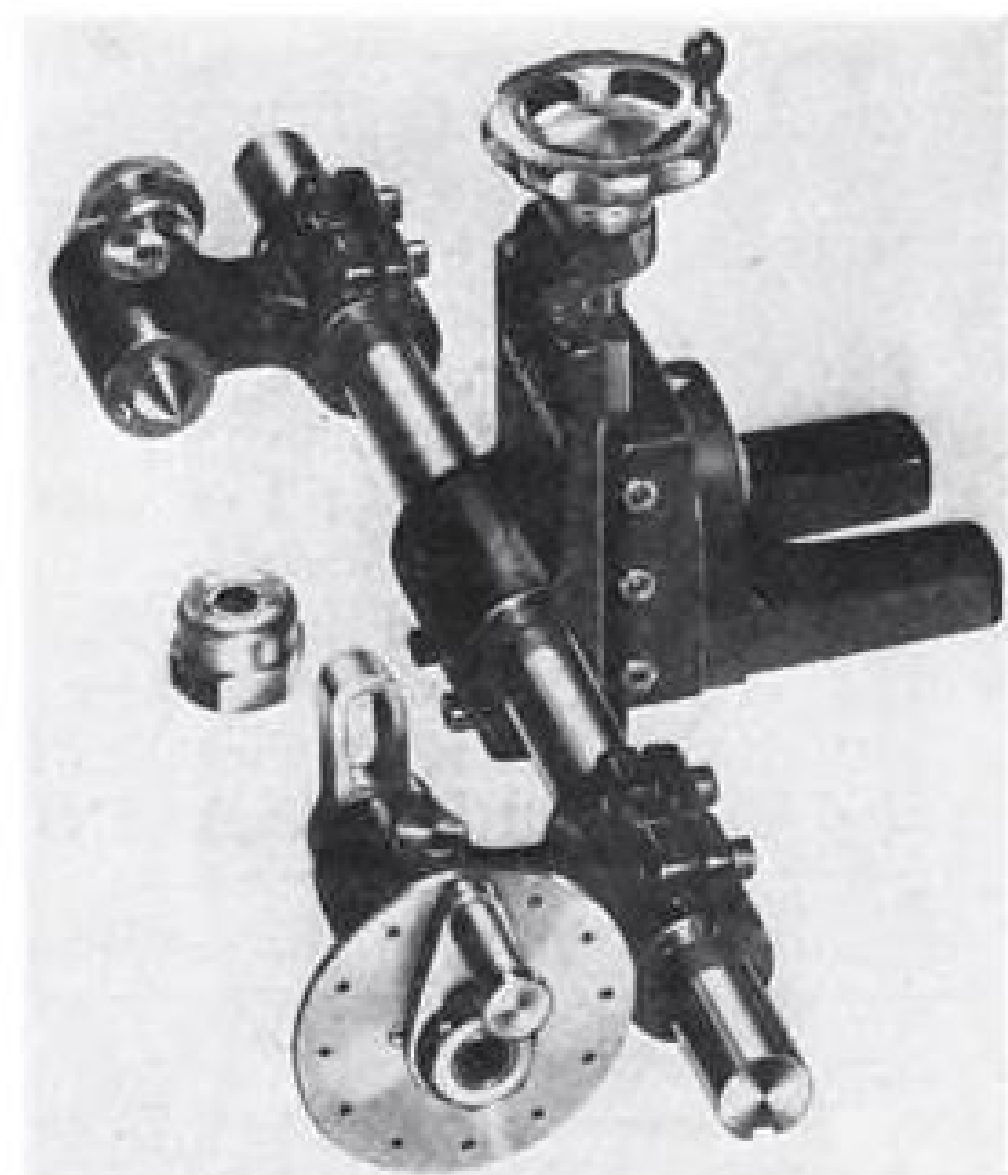
Maggin, Bernard; and Shanks, Robert E.: The Effect of Geometric Dihedral on the Aerodynamic Characteristics of a 40 Degree Swept-Back Wing. NACA T. N. No. 1169.



## NEW AVIATION PRODUCTS

### Indexing Milling Attachment

For aircraft machine shop operations, new indexing and milling attachment Model 300 for such jobs as cutting gears, splines, keyways, oil grooves, slots, square shafts, hexagons, and flats on circular pieces, is offered by **Chicago Tool & Engineering Co.**, 8383 South Chicago Ave., Chicago 17, Ill. Device takes work up to 4 in. dia. and 11½ in. between centers when 18 in. supporting bar is used, and will fit lathes with tool posts up to 1½ in. dia. Head and tailstocks are held by keys on supporting bar having full length keyway for horizontal movement. Vertical feed travel of 1½ in. is provided by dovetail type slide and fine screw adjustment. Gibs have adjusting screws for wear take-up. Chuck with ½-in. capacity collet, tailstock center, and 12-hole indexing plate and arm are also furnished. Other indexing plates may be had for other divisions.



### Valve for Air, Hydraulics

New flow control valve designed to provide more accurate control of cylinder speed plus unrestricted flow from cylinder, is announced by **Pneu-Trol Devices, Inc.**, 3122 No. California Ave., Chicago 18, Ill. Unit is intended to give greater efficiency with air or hydraulic power by eliminating abnormal pressure of exhaust from return side of cylinder, increasing cylinder effective pressure with spring loaded checks. When flow is to cylinder (in either direction), ball check instantly closes and flow path is directed through valve having wide range adjustment. Reverse flow from cylinder is unrestricted because unloaded ball check opens wide on slight change in pressure. Unit is made in ¼, ½ and 1 in. pipe sizes.

### Multiple Drum Carrier

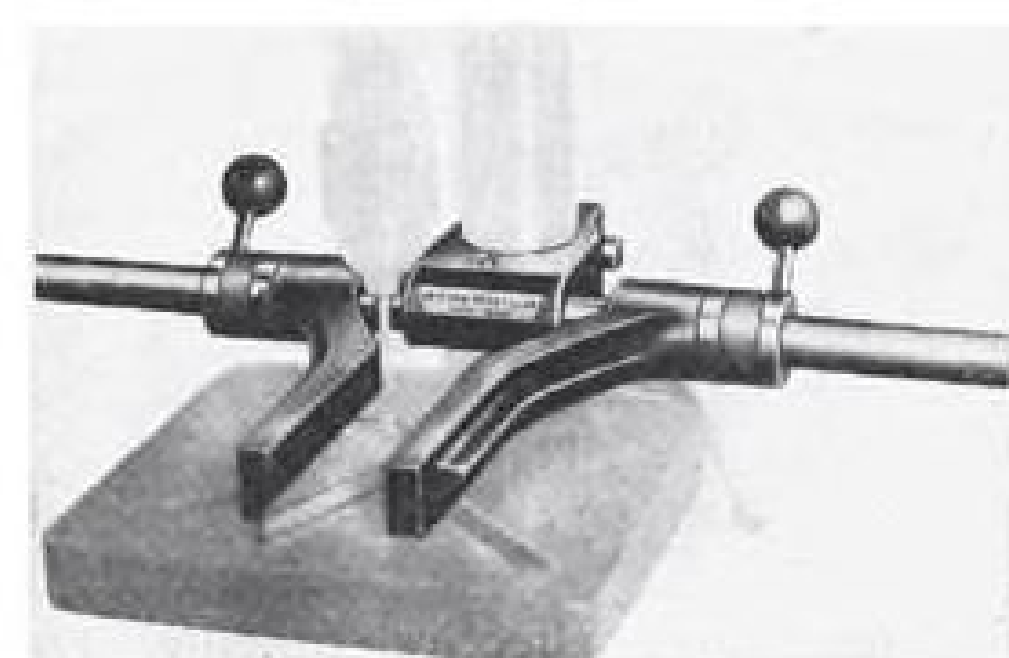
Adaptable for drum haulage at air terminals or in shops, Tray-Hart drum carrier has soft rubber gripping shoes and fits fork-type power truck. Device,



marketed by **Pallet Engineering Co.**, 7825 Second St., San Francisco 7, Cal., handles up to four drums, has positioner allowing 4 in. either side of center to save "spotting" time, and allows for drum variances of 2 in. in dia. and 6 in. in height. Quick-detachable hydraulic valve is stated to make possible attachment or removal of carrier in 10 min.

### Supplements Small Drill Presses

Suitable for aircraft production plants and repair shops, new safety work holder is designed to prevent drill press accidents and improve work quality and output. Developed by **Universal Vise & Tool Co.**, Parma, Mich., device quickly clamps to column of small standard drill press and secures work with quarter-turn of lever. Frequently, unit can substitute for simple drill jigs. Clamping arms are adjustable along length of cross arm to encompass full width of drill press table and are quickly swung back to clear drill jig or machine vise when necessary. Standard sizes fit drill presses with columns of 1½, 2¼, 2½, 3, 3½, 3¾ or 4-in. dia.



### High-Temperature Metal

Designated as K138, new cemented carbide composition made by powder metallurgy process has been developed by **Kennametal Inc.**, Latrobe, Pa., to withstand temperatures that usually destroy cast alloys and conventional carbide compositions. Properties claimed are: Transverse rupture strength, room temp., 175,000-210,000 psi.; tensile strength at 1,800 to 2,000 F., 15,000 to 20,000 psi.; transverse rupture at 1,800 F., 100,000 psi.; Young's modulus 55,000,000; hardness, RA, 91.0-92.0; specific gravity 5.5; thermal expansion  $5.0 \times 10^{-6}$  per deg. F., 300 to 1,200 F.; thermal conductivity .085 cal./sec./°C./cm.; electrical conductivity 5.0% of copper standard; and resistance to combustion gases up to 2,100 F., no apparent attack in 48 hr.

## Information Tips

### Data on Radial Engine Suspension

Seven feature points on radial engine suspension—smooth flight, low weight, safety, long life and less maintenance, engine movement dampening, easy installation, and mounting ring and crankcase protection—are emphasized in 6-page fold-out color bulletin being mailed by **Lord Mfg. Co.**, Erie, Pa. Titled "Dynafocal Radial Engine Suspension MR-26 for R-1830 and R-2000 Engines," literature contains detailed drawings and information on assemblies, also tabulates specific mountings for 19 different engine models.

### Describes Measuring Instruments

For research engineers, **Gaertner Scientific Corp.**, 1201 Wrightwood Ave., Chicago 14, Ill., issues eight-page illustrated booklet of company's standard precision instruments grouped according to basic uses—linear, coordinate, angular, spectral, polarized light, photometric, optical test, and time measurements, also optical parts and special apparatus.

### Materials Inspection

For engineers charged with responsibility of maintaining quality control techniques, new four-page folder "Inspecting Incoming Material" is offered by **North American Phillips Co.**, 100 E. 42nd St., New York, N. Y. Suggested are procedures that may be followed from time material arrives in plant until final acceptance or rejection. Also presented, are some requirements covering typical inspector training course.

### Industrial Aluminum-Prefab

Suitable for tool house, workshop, storage shed, warehouse, or special processing building in conjunction with airports and plants is "Alumi-Drome," new all-aluminum prefab building. Details and specifications are available from maker, **Reynolds Metals Co.**, 2500 So. Third St., Louisville 1, Ky.

### Protection for Aluminum

Folder issued by **American Chemical Paint Co.**, Ambler, Pa., describes "Alodizing" process, stated to be rapid, effective, and economical method for protecting aluminum and anchoring paint. Production sequence for process is illustrated.

### Mechanical Power Press Jobs

For process engineers, new 6-page illustrated bulletin No. 392 issued by **General Mfg. Co.**, 6429 Farnsworth, Detroit 11, Mich., contains descriptions and data on mechanical flexible power presses for production straightening, bending, assembling, push broaching, and cold riveting. Contained is explanation of mechanical operation so operator can exert as much or as little power required by simply varying pressure on foot pedal.

## AVIATION SALES & SERVICE



Clifford Evans (left) and George Truman meet Orville Wright when they stop at Dayton on the last lap of their round-the-world flight which ended a few days later at Teterboro (N. J.) airport. (Press Association)

## Personal Plane Progress Noted In Round the World Flight

Standard American lightplane equipment survives grueling 25,000 mile test without major failure.

By ALEXANDER McSURELY

Benefit for all phases of personal aviation may be assumed as an inevitable result of the successful 25,000 mi. round-the-world flight of Clifford Evans and George Truman in virtually standard American lightplanes; with standard engines, propellers, radios, instruments and equipment, duplicates of those used by thousands of American private flyers.

Reception by President Truman at the White House after their arrival back home in Washington followed their triumphal flight across the country to complete their circuit by touching down at the trip's starting point at Teterboro Air Terminal, N. J. Beginning Jan. 2, their planes, two Piper super-cruisers, powered with 100 hp. Lycoming engines, which turn aluminum McCauley Met-L-Props, will be on exhibit in the Museum of Science and Industry at Rockefeller Center, New York.

Story of their adventure flight is being serialized for *Colliers'*, and they have numerous other commitments which will presumably result in remuneration for themselves.

But these personal dividends may well be small in relation to the impetus which personal aviation may expect to derive generally.

There are five factors which give the Truman-Evans flight a powerful potential impact on the aviation consciousness of this nation and the world:

- The flight was a gruelling and convincing proof in duplicate, that low-cost American personal aircraft with only minor variations from standard equipment with experienced careful pilots can fly to virtually any spot in the inhabited world and come back.
- Without detracting from the sturdy Piper Super Cruiser's outstanding accomplishment in this flight, it is only slightly different from thousands of other high-wing, strut-braced easy-to-fly personal planes which are available to purchasers at airports across the country.
- The intangible factor of the American competitive spirit, must have stirred a desire in many a pilot to excel the Truman and Evans flight.
- The fact that the two pilots made this trip all the way around the world with approximately \$1,000 in ready cash between them. (They had about \$15 apiece in their pockets when they taxied up to the Washington National Airport terminal for their homecoming celebration.)
- The fact that Truman and Evans

gave a convincing demonstration of American-built aviation equipment in some 20 foreign nations is likely to provide a boost to the export market although due to dollar shortages this may not be a major factor in the overall sales picture.

The trip totalled approximately 260 hrs. of flying time. The pilots left Teterboro at 11:10 a.m. Aug. 9, and they returned Dec. 12. Their itinerary included: Presque Isle, Me.; Goose Bay, Labrador; Blueie West I, Greenland; Meeks Field, Reykjavik, Iceland; Newton Ards, Ireland; Croydon Airport, London; Brussels, Belgium; Hague and Ypenburg, Holland; Paris and Marseilles, France; Rome, Cairo, Bagdad, Iraq; Dhahran, Saudi Arabia; Karachi, Pakistan; Jodhpur, Allahabad, Calcutta, India; Rangoon, Burma; Bangkok, Siam; Hanoi, Indo-China; Hong Kong, Amoy and Shanghai, China; Fukuoka, Nagoya, Tokyo, and Hokkaido Island, Japan; Aleutian Islands; Shemya, Adak, Cold Bay, Nahnek, Anchorage, Big Delta, Northway, Alaska; White Horse, Ft. St. John, Edmonton, Canada; Van Nuys, Calif.; Amarillo, Tex.; Oklahoma City, Oklahoma; Kansas City, Dayton, Allentown, Pa., and Teterboro.

The four-cylinder direct-drive air cooled horizontally opposed Model O-235-C Lycoming engines, rated at 100 hp. at 2600 rpm. and weighing 243 lb. which powered the Super Cruisers, come in for a large share of the credit. So do the McCauley propellers, the first of this make ever installed on a Super Cruiser. Fourteen years ago, Wiley Post spanned the Atlantic and the Pacific with his Winnie Mae Lockheed, with a powerplant five times as powerful, and this is the closest comparison in history.

Except for additional instruments and radio, and extra fuel tankage, (105 gal. in addition to the regular 35 gal. tanks) the Super Cruisers were essentially standard. Both airframes were used before Piper turned them over to Evans and Truman. The writer watched progress of the "City of Washington" (Evans' plane) with more than passing interest since the same craft had carried him down to Miami, Fla., the winter before.

Detailed list of the equipment carried has been previously reported in *AVIATION WEEK* (Sept. 15 issue). Truman described the flight as a test of a simplified instrument panel, since they made the entire trip without a turn and bank indicator in either plane.

A tiny "home-made" simplified drift





*Getting around  
corners...  
on the job!*

"FLEXONICS AT WORK"

Left—Rex-Flex units are manually bendable in multiple planes at the point of installation where necessary. Below—After installation, Rex-Flex maintains the desired form without extra hangers or brackets.



## ... with REX-FLEX FLEXIBLE AIRCRAFT DUCTING

Bending Rex-Flex units to fit—on the job—is one of the big time- and effort-saving advantages you get with this strong, crush-resistant stainless steel ducting. In tight spots, Rex-Flex can be literally threaded into position... And after connection to adjoining flanges, it *stays* formed as installed.

Rigid, semi-rigid, and flexible sections can be built into a single unit of

Rex-Flex Ducting to fit precisely in designated locations without waste space or extra couplings. Rex-Flex is air and gas tight, fireproof, odorless, and has high resistance to vibration and bending fatigue.

For lightweight safety, dependability and economical installation: specify Rex-Flex for all aircraft ductwork. Full details on request.

**CMH** CHICAGO METAL HOSE  
CORPORATION  
Maywood, Illinois  
Plants at Maywood, Elgin and Rock Falls, Illinois



"the science of FLEXONICS..." "the controlled bending of thin metals for use under varying conditions of temperature, pressure, vibration and corrosion"... is exemplified in the basic products of Chicago Metal Hose Corporation.

"FLEXON" identifies CMH products, which have served industry for more than 45 years.

meter developed by Evans, (details undisclosed pending completion of patents) worked out very nicely the flyers reported and they were never more than a few miles off course. Evans estimated the device weighs about 12 oz. and could be marketed for around \$10 if produced in quantity.

Fuel consumption on the trip averaged about 5.8 gal. hr. with a total consumption of nearly 1,600 gal. which would be a pretty good fuel consumption for an ordinary automobile for the same mileage. Except for changing the sparkplugs, which didn't need it, minor adjustments, and 100 hr. engine check, there wasn't any work done on the powerplants. Fuel burned ranged all the way from 73 octane to 130 octane at various ports.

Truman and Evans had no de-icing equipment except for electric heat in the pilot tubes.

The successful completion of the flight can be attributed in large part also to the experience and skill of the two flyers, and their levelheaded judgment in remaining grounded when weather demanded. Both are former service pilots, Truman with Air Transport Command and Evans with an air cargo task force in the CBI theater. Both were flight instructors at College Park (Md.) Airport before their record world flight.

## New Amphibian Tested By Delaware Firm

**Twin-engine, six-place craft designed for all-around use; has speed of 125 mph.**

Successful preliminary flight tests of a new six-place amphibian have been announced by its builders, Aquafight, Inc., Wilmington, Del. The plane has been designed to fill the need for a light twin-engine amphibian with moderate cruising speed and enough cargo space for all around use.

The prototype was designed by Meredith C. Wardle and is designated as the W-6 (Aqua I). Craft features a high wing all-metal fuselage with a wooden hull equipped with large seawings for water stability. Seawings also house the main gear of the tricycle undercarriage (nose wheel retracts into a well in the nose of the hull).

Large windshield and a total of four windows on each side provide excellent visibility for passengers. Two doors in front and two rear cargo-size doors provide easy access over the broad seaway. A spacious forward deck accessible from the front seats facilitates water handling.

► **Performance**—Initial flight tests have indicated that the W-6 will cruise about

125 mph. with a useful load of 1,400 lb. and an estimated maximum range of 750 mi. The plane's rate of climb is said to be very good and its landing speed quite slow.

Associated with the project for six months was James R. Coyne formerly production liaison engineer at Curtiss-Wright in Buffalo who assisted on production design, otherwise all engineering work was done personally by Wardle. The wooden hull was constructed in Wilmington by Joseph DiMauro, formerly Bellanca wood shop foreman, with the metal airframe contracted to Shawda Metalaire, sheet metal fabricators in Shamokin, Pa. Final assembly and flight tests have been conducted at the Philadelphia Seaplane Base whose manager, Frank Mills, is conducting the water based tests.

The Aqua I, powered by two Lycoming model O-209A four cylinder 125 hp. engines, is expected to have low maintenance and operating costs. During the extensive water taxiing and climb tests, engine cooling was completely satisfactory without necessitating the use of an oil cooler.

## Owners of Company Planes Form Group

Executives of industrial and business firms who operate private planes for personnel transport and freight service

have organized the Corporation Aircraft Owners Association, Inc. to facilitate fuller exchange of information among each other concerning any possible use of this aircraft.

Incorporated in New York State on a non-profit basis, the CAO A plans to examine all Federal, State and municipal legislation, regulations, and decisions which may affect private industrial plane operations; exchange information through monthly bulletins, surveys, meetings and other activities; work with other aviation groups; encourage improvements in aircraft, equipment and services through joint cooperative action, and the promotion of safety and economy in the operation of members' aircraft.

While no definite restrictions have been placed on the categories of planes operated by members, it is understood that eventually membership will be restricted to large single engine and multi-engine aircraft, since owners of smaller planes are adequately served by the existing Aircraft Owners and Pilots Association.

► **Officers and Members**—Officers of the new organization, chosen by the members at the annual meeting in New York, are: W. B. Belden, Republic Steel Corp., Cleveland, Ohio, Chairman of the Board; J. B. Mitchell, Howes Brothers Co., Boston, Mass., Vice Chairman; P. J. Lathrop, Bristol-Myers Co., Hillside, N. J., Sec.-Treas.



## NEW EXHAUST FOR SKYWRITING

New 19-jet smoke exhaust designed to produce tighter packed and longer lasting signs aloft will combat effects of previously used exhausts that permitted the smoke letters to roll out and away from their places in the sign. Equipment is inspected at Southwest Airmotive in Dallas by pilot Jim Gregg of the Skywriting Corp. of America.



## Bradley Field Joining Conn. Airport System

Bradley Field, Windsor Locks, Conn. developed during the war by the Army Air Forces and Engineers Corp., who spent some \$17,000,000 on its installations, is being returned to the Connecticut Aviation Commission, debt free, for civilian operation.

The site consisting of 2,007 acres is equipped with three 5,000 ft. x 300 ft. black top hard surfaced runways, lights for night operations, a control tower, concrete ramp 1,600 ft. x 400 ft., and a gasoline system containing 14 bulk gasoline tanks providing storage for 350,000 gal. A complete water system and sewerage disposal plant together with 26 miles of roadways and 170 temporary type buildings erected by the Army complete the facilities available at the present time.

Several buildings have been interconnected to form a temporary terminal-administration building pending formulation and execution of state plans for improvement of facilities. This temporary building houses field administrative offices and airline facilities for Eastern and United now operating from the field.

Bradley Field's fire fighting equipment was purchased from the Army and is manned 24 hours per day. The facilities also are being used by the state as a fireman's training school.

The field is patrolled by a special police force, trained and paid by the state commission.

Future plans include construction of a new terminal building, large hangars, and widening some of the existing roads to provide adequate access to the operations area. Some of the present roadways will be closed to save maintenance costs, and certain of the temporary buildings will be removed and materials salvaged.

Income will be derived chiefly from airline operations and heavy maintenance work done by contract operators. Present plans of the management do not include any fixed base flight operations or flying schools. It is understood that the State may later erect buildings which will be leased to manufacturers and suppliers desiring space at the site of the field.

Control tower will be operated by the State Aviation Commission, the Civil Aeronautics Authority will furnish facilities for air traffic control outside the airport area.

Control of the present Hartford range station, and the proposed new facility at East Windsor will be located at Bradley Field. CAA personnel have begun operation of the voice facilities of Air Traffic Control from this site at the present time.

## BRIEFING FOR DEALERS & DISTRIBUTORS

**RYAN SIGNS WOOTTEN**—Carl Wootten, head of Wootten Aviation Industries, Orlando and Jacksonville, Fla., has been named a Ryan Navion distributor in Florida and Georgia and expects to establish a third branch shortly in Atlanta. He expects to get his first 1948 Navion demonstrators in time for showing at the All-American Air Maneuvers at Miami in January. Before signing the new Ryan contract, Wootten had been associated with Beech Aircraft Corp. for six years, most recently as Florida distributor, and earlier as general sales manager of Beech. He had previously served as a factory representative with Taylor Aircraft (predecessor of Piper) in 1933, and later as general sales manager of Taylorcraft Aviation, Alliance, Ohio and as vice president sales, at Aeronca Aircraft, Middletown, Ohio.

**OKLAHOMA CITY AIR CROSS ROADS**—Announcement of Skyway Eleven, first international north-south 40-mile wide contact flying route for private flyers, puts Oklahoma City, long active in aviation, in a strategic position at the crossroads of both this and the older east-west transcontinental Skyway One. Success of the air marking program thus far along Skyway One has led to the designation by CAA of this second Skyway, and others are planned to follow. Skyway Eleven runs from the Canadian border at Pembina, N. D. south to the Mexican border at Laredo and Brownsville, Texas. It divides twice into east at Sioux City, Iowa, into east and west alternate routes, recombining into a single route at Manhattan, Kan. It separates again at San Antonio, Tex. with alternate routes to Laredo and through Corpus Christi to Brownsville. As is the case with Skyway One most of the airmarking will be done by state aeronautics departments along the way, with CAA and local communities cooperating. Wichita, another one of the most air-minded cities per capita in the U. S., is on the new Skyway Eleven. Airmarking has already started on the southern portion of Skyway Eleven, and the northern markings will begin as soon as weather permits.

**AMPHIBIANS PLACED**—Goodyear Aircraft Corp. recently placed GA-2 amphibians with Hummel Aviation, Hopewell, Va., and with Southern Aviation Corp., Shreveport, La., as a part of its widespread field service test program on the airplane, before making final decision on its production and marketing.

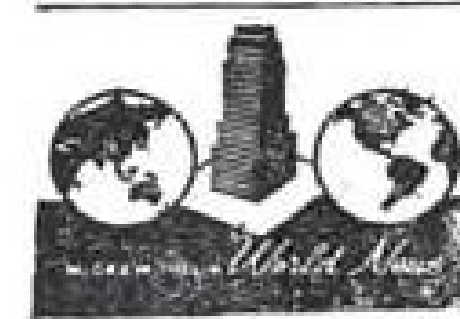
**NEW MATERIALS**—Greater use of magnesium and of laminated glass plastics in lightplane fabrication, standardization of parts by manufacturers and improved design to increase utility, are cited by Will M. Duke, research chairman, Cornell Aeronautical Laboratory, Buffalo, as logical steps toward lowered plane costs to reach a larger market.

**LAUDENSLAGER RE-ELECTED**—Walter Laudenslager, Red Bank (N. J.) airport, has been elected president of the New Jersey Aviation Trades Association for a second year. Other officers named are Tom Robertson, Hadley Field, vice president; Michael Diciurio, Pitman Airport, treasurer; and Albert Snyder, Barrington, temporary secretary. Plans for a program of better public relations between fixed base aviation and the aviation consumer and cooperation with public authorities for rapid apprehension of flight regulation violators were announced.

**STALL INDICATOR FLEET**—Midwest Flyers, Lakeside Airport, E. St. Louis, has installed safe flight stall warning indicators on a fleet of 35 Aeroncas, Piper Cubs and other training planes. Installations were made at the time of 100 hr. check. Omar Midyett, head of Midwest, estimated that his investment of more than \$1,000 in the stall warning devices will eliminate damage caused by stall accidents in the next year, amounting to more than the cost of the instruments. Dropped-in landings and other types of accidents resulting from stalls result in large losses annually. Midwest has 247 students enrolled, flying as much as 250 hours in training daily.

**AMBULANCE BONANZA**—Further extending the charter possibilities of the Beech Bonanza, which is turning out to be a postwar favorite for this use, is the ambulance version of the four-placer. Company does not indicate whether field kit for modifying planes now in service will be made available, but the modification is now available as optional original equipment. It provides a special metal litter base equipped for clamp fasteners for holding a stretcher, which is mounted on the right side of the cabin after removing the back of the right front seat, and the entire standard rear seat. A single attendant seat is placed in the left rear corner of the cabin so that the plane will accommodate pilot, attendant, and patient. Extreme quietness of the airplane makes it particularly adaptable for ambulance use, the manufacturer points out.

—ALEXANDER McSURELY



## AVIATION WORLD NEWS



### Two U. S. Airlines Ask To Operate in Japan

Pan American, Northwest applications forwarded to Washington by SCAP.

**TOKYO**—Applications from Pan American Airways and Northwest Airlines for permission to operate a civilian internal airline in Japan are being considered by the Air Coordinating Committee and the Joint Chiefs of Staff in Washington.

The applications were recently forwarded by GHQ, Supreme Commander for the Allied Powers, which concurred in the airlines' premise that such an airline would assist in the resurgence of trade in Japan. However, it did not suggest that such a step was absolutely essential to the occupation.

► **Airports Available**—Available for use of a commercial airline are airports in the vicinity of Sapporo, Sendai, Tokyo (Haneda where international air carriers now operate), Nagoya, Osaka, Hiroshima and Fukuoka. First service probably would be started from Tokyo to Nagoya, Osaka and Fukuoka, followed by operations to Sendai and Sapporo.

These are the same main routes formerly followed by the Japan Airways Co., a monopoly created by law and governmentally subsidized. Domestic air travel was not exploited fully before the war. Japan placed its main emphasis on air links with the spreading empire.

Northwest officials here visualize daily service on the Kokuoka line and thrice weekly schedules to Sapporo. In order to provide this service they would require three DC-3s, and 15 more American personnel for flight crews and maintenance. Tokyo is the division headquarters for this line and could easily absorb the extra operation.

► **Plans Differ**—However, Northwest professes to prefer a jointly operated airline with other foreign carriers participating in its establishment. Pan American contends that a single operator is best. It claims that it will not play on a team plan.

More serious disagreements to operating an internal airline will come from foreign countries, who either desire a share of the program or wish to prevent any Japanese activity in the air whether or not it be completely foreign controlled and operated. State Department officials are shaky about the business and would like to see decisions postponed.

### Johannesburg Letter:

## Air Tramps in South Africa

**JOHANNESBURG**—Just as Britain's prosperity was founded on the humble tramp steamer, some air freighting enthusiasts in South Africa hope to lay the basis of a new era of prosperity and power in the sky with aerial tramps.

London Aero Motor Service (LAMS)—British air freighting organization with links in South Africa and Australia—has embarked on extensive air tramping operations at rates believed to be below operators' normal rates. They work out at 8s 6d a mile for a 6½ ton load, or about 25 cents a ton mile.

LAMS is based at Stansted, Essex, England, Benoni in South Africa, and Sydney in Australia. It hopes to obtain a fourth base in the Middle East and there is a possibility of its linking with a United States operator.

Air tramping, says its proponents, enables aircraft to operate along normal trade routes, and the operators expect to be able to operate more economically and carry one-way loads without charging for the empty return journey. Lower costs are expected to lead to more business and—to complete the cycle—to further freight reductions.

LAMS may be a participant in an airline catering to Jewish patronage, if plans of Abel Shaban of Skytaxi Ltd., Johannesburg, are successful. Shaban has been negotiating with the Jewish Agency in Palestine for a joint airline involving Skytaxi, the Agency, LAMS and Aviron, the Palestine Airways Corp.

The South African Railways, Harbours and Airways organization is continuing its policy of giving South African names to ships and aircraft operating under its aegis. South African Airways has named its Skymasters after mountain ranges, eight Vikings and two Doves after well-known mountain peaks and its two Lodestars for

prominent historical figures.

Five of eight Vikings have been delivered. The other three and a second Dove are expected soon. The carrier took delivery of the last aircraft of the Skymaster type made by Douglas, and there was more than passing interest in the recent visit to the Union of Sabena's DC-6 with a Douglas sales manager aboard.

\* \* \*

Many South Africans who worked and flew in air force squadrons during the war are anxious to retain the benefit of their experience, and Active Citizen Force Squadrons are being formed in many towns in the Union. They fly South African Air Force craft when possible during weekends in non-continuous training programs, and take three weeks continuous training each year at a defense force flying school. Most will start as fighter squadrons. Bomber squadrons may be added later.

First city to form a fighter squadron was Pretoria. Other centers have arrangements in various stages of completion.

\* \* \*

Aircraft are being used increasingly in pest control. The South African Air Force and Central African Airways have been busy in the Rukwa Valley in Tanganyika spraying large areas where locusts breed, and aerial spraying has been resorted to in Zululand in efforts to exterminate the tsetse fly.

\* \* \*

Half a million tons of waste rock from the Witwatersrand gold mines were used in foundations for the runways at the new Jan Smuts airfield between Johannesburg and Pretoria. Each runway will have a rock foundation of 16 ft., with 4 in. of macadam on top to accommodate aircraft up to 250 tons and over if necessary. Special test beds are also being prepared for jet-propelled planes.—J. M. Lawless



# AIR TRANSPORT

## Parks, Southern Airways Grow To 'Super Feederline' Size

CAB decision in Mississippi Valley Area Case fails to designate new short-haul operators but balloons existing local carriers by 2,681 miles.

By CHARLES ADAMS

Striving to find a successful formula for its local service experiment, the Civil Aeronautics Board this month ballooned two carriers, previously designated for short-haul operations, into "super feederlines."

The Board, in issuing its decision in the Mississippi Valley Area Case, failed to authorize any new local operators. But Parks Air Transport, East St. Louis, Ill., which previously was designated for about 2,250 route miles in the North Central and Great Lakes Area decisions, was awarded further extensions totaling 1,437 miles.

► **Experiment in Size**—Southern Airways, Birmingham, Ala., recipient of a feeder network totaling 1,367 route miles in the Southeastern Area case, was given new links aggregating about 1,000 miles. The Board indicated that expanding Southern Airways and Parks, rather than setting up entirely new feederlines, would demonstrate whether increasing the size of local systems will help solve the critical problems of operating costs, equipment utilization and financing.

Trans-Texas Airways, which began

operations on its feeder system in October, was granted a new segment from Lufkin, Tex., to Houston via Beaumont and Galveston. The addition boosts TTA's total route miles above the 2,000 mark and makes it the third largest short-haul carrier. By contrast, Florida Airways, the smallest feeder, has only 476 route miles.

Neither Parks nor Southern has started operations. But the former recently asked CAB to permit inauguration of service with DC-3s, stating that airport facilities are adequate. (AVIATION WEEK, Dec. 1).

► **Branch Dissents**—In the Mississippi Valley decision, CAB member Harlee Branch repeated the dissent expressed in the Board's Great Lakes Area Case last September. At that time Branch voiced disappointment with feeder progress to date and said he did not intend to sanction any new experimental short-haul routes until the results of three years' experience with previously-authorized systems could be evaluated.

Branch's latest dissent noted that feeder operations have cost far more

than originally estimated, adding that investors have sustained substantial losses. He said operation of the additional 2,681 miles of local service authorized in the Mississippi Valley Area decision would cost the government about \$2,000,000 in mail pay annually on the basis of two roundtrips daily under prevailing feeder mail rates.

► **Ninth Decision**—The Mississippi Valley case is the ninth area proceeding to be decided by CAB, with only the Middle Atlantic and Arizona-New Mexico cases still pending. The number of feederlines certificated or designated for certification by the Board remains at 16 as a result of the Mississippi Valley decision, but total route mileage has climbed above 22,000.

New routes awarded Parks are: St. Louis/East St. Louis to Davenport, Ia./Moline, Ill., via Burlington, Ia., and other points; St. Louis/East St. Louis to Memphis, Tenn., via Cairo, Ill., Paducah, Ky., and other points; St. Louis/East St. Louis to Tulsa, Okla., via Jefferson City, Springfield and Joplin, Mo., and other points; Kansas City, Mo., to Tulsa via Topeka, Kans., Coffeyville, Kans., Bartlesville, Okla., and other points. Links awarded Parks in the Great Lakes and North Central cases extended from Chicago to St. Louis, Indianapolis, Sioux City, Ia., Des Moines, Ia., and Minneapolis/St. Paul via a number of intermediate points.

► **New Orleans Extension**—Southern Airways' new links were: Memphis, Tenn., to Jackson, Miss., via Clarksdale, Greenville and Vicksburg, Miss.; Columbus, Miss., to Jackson via Meridian; Jackson to New Orleans via Natchez,

Miss., and Baton Rouge, La.; and Meridian, Miss., to New Orleans via Hattiesburg, Miss., Mobile, Ala., Gulfport/Biloxi, Miss., and other points. In the Southeastern Area Case decision last April, Southern Airways was designated for routes from Memphis to Birmingham, Ala., Charlotte, N. C., Atlanta, Ga., Jacksonville, Fla., and Charleston, S. C.

Both CAB members Ryan and Branch protested the designation of Southern Airways for service to Baton Rouge and New Orleans, La., stating that the carrier had not applied for this route in the Mississippi Valley Area case. As a result, the Board agreed to grant further hearing on Jackson-New Orleans service if other parties to the Southeastern or Mississippi Valley case feel themselves aggrieved by the decision.

► **New MCA Link**—In other parts of the Mississippi Valley opinion, CAB extended Mid-Continent Airlines' route 26 from Kansas City, Mo., to St. Louis

via Jefferson City, Mo. Previously, TWA was the only carrier on the Kansas City-St. Louis run.

Lafayette/New Iberia, La., was designated a new intermediate point on Eastern Air Lines, Route 5; Longview/Kilgore, Tex., was added to Delta's route 24; Hot Springs and El Dorado, Ark., were added to Chicago & Southern's route 8; and Quincy, Ill./Hannibal, Mo., to TWA's route 2.

► **Bids Denied**—Applications of Continental and Mid-Continent for extensions from Kansas City to Chicago were denied. Eastern's bid to push its route 47 westward from St. Louis to Kansas City and route 5 from Lake Charles, La., to Ft. Worth also were denied.

National was denied a route 39 extension from New Orleans to San Antonio and Dallas/Ft. Worth. Braniff failed to receive a requested new route 9 link between Houston and New Orleans. Chicago & Southern was denied an extension from New Orleans to Houston, San Antonio and Brownsville.

## Airlines Analyze 1947 Progress

Traffic gains, safety record reported in Air Transport Association study.

Air transportation continued to make faster progress during 1947 than its surface competition despite the failure of domestic passenger travel to equal the optimistic predictions made early this year.

Revenue passenger mileage on the certificated domestic lines is expected to show a modest 5 percent gain in 1947 over 1946 instead of the 25-50 percent increases widely forecast. But even this showing contrasts with the sharp dip in passenger travel experienced by the railroads and bus companies.

► **Pullman Traffic Dips**—During the first nine months of 1947, Pullman passenger miles on class I railroads fell 42 percent below the same 1946 period, the Air Transport Association reports. Railroad day coach passenger miles dropped 31 percent and bus traffic 5 percent.

Passenger revenues on the domestic airlines during the first three quarters of 1947 rose more than 11 percent over the like 1946 period. Total passenger revenue of the railroads, on the other hand, declined 26 percent and passenger revenues on intercity motor carriers fell 10 percent. Airline passenger revenue recently has been about 35 percent of Pullman and day coach revenue.

► **Revenue Gains**—The domestic airlines' total revenue from passengers, mail and cargo gained 14.6 percent in the first nine months of 1947. Overall railroad income rose 12.55 percent,

while bus revenues slumped 9 percent.

But airline expenses rose at an even faster clip than revenues in the first three quarters of the year, thus accounting for the \$10,593,000 operating loss suffered by domestic carriers during the period. Airline costs were up 20.9 percent compared with the 14.6 percent revenue increase. Railroad operating costs rose only 5.2 percent and bus operating expenses 3.8 percent.

► **Mail Volume Down**—Airline traffic volume for all 1947 probably will show increases over 1946 in every category but domestic airmail, where a ton mile drop of less than 1 percent is expected. Most impressive gains were registered in domestic cargo and all types of foreign air transportation.

Domestic airfreight volume over the certificated lines is expected to total 40,702,000 in 1947, up 111 percent over 1946. Domestic air express is estimated at 30,103,000 ton miles, a gain of 26 percent.

► **Feeder Showing**—Addition of feeder traffic to the total should bring revenue passenger mileage on the domestic airlines to about 6,284,759,000 in 1947, up 5.6 percent over 1946, according to the Air Transport Association. Revenue passengers flown on both domestic trunklines and feeders should aggregate around 13,198,000 this year, up 7.7 percent over 1946, the Association said.

Separated out of the total, the eight feederlines active in 1947 are expected to carry around 246,000 revenue passengers 49,036,000 revenue passenger miles with an average passenger load factor of 31 percent. ATA estimates

revenue plane miles flown by the short-haul operators will total 10,206,000; mail ton miles 176,000; express ton miles 131,000; and freight ton miles 83,000.

► **Employment Off**—With the feeders included, the average trip per passenger dropped slightly from 487 miles in 1946 to 476 in 1947. Certificated domestic trunkline route miles rose from 84,358 last year to over 110,000, while mileage assigned local operators increased from 11,563 last December to more than 22,000. Domestic employment decreased from an all-time high of 69,127 in 1946 to 61,711 late in 1947.

Effects of fleet and schedule expansion were reflected in the increase of available seat miles to 9,710,485,000, up 28 percent. These factors contributed to a reduction in the overall domestic revenue passenger load factor to about 64 percent in 1947 compared to 78 percent in 1946.

► **Safety Record**—Barring accidents during the holiday, the domestic airlines' fatality rate in 1947 is calculated at 3.21 per 100 million passenger miles. Last year the rate was 1.24.

Fatal accidents suffered by domestic carriers numbered only 5 during the first 11 months of 1947 compared with 9 in 1946. But the crashes involved larger planes and resulted in the death of more persons.

► **International Lines**—U. S. international operators are likely to achieve a lower passenger fatality rate for the year than domestic carriers. Through Dec. 21, the nation's certificated flag lines had a fatality rate of 1.08 per 100 million psgr. mi. against 3.54 in 1946.

Revenue passenger miles flown by U. S. international carriers are expected to total 1,886,093,000 in 1947, up 71 percent over 1946. But as in the case of domestic operations, capacity outdistanced traffic, with available seat miles increasing 102 percent.

► **Load Factor**—Thus the passenger load factor on U. S. international carriers this year will be around 60 percent against nearly 71 percent in 1946. Length of the average trip per passenger jumped from 1,057 to 1,335 miles. Certificated route mileage for U. S. international operators rose from 175,488 in 1946 to 178,768 in 1947, while employment increased from 19,327 last year to 22,391.

International transportation of air cargo (both freight and express) by U. S. overseas operators gained about 127 percent in 1947.

Number of aircraft in service (including the grounded DC-6s) on both domestic and international routes reached 961 this month, of which 793 were operated domestically and 168 to points outside the U. S. This compares with 809 planes at the end of 1946, of which 659 were in domestic use and 150 on overseas runs. About 300 are still on order.



AMBASSADOR SHOWS ITS LINES

Late photos of the British Airspeed "Ambassador" both in flight and on the ground reveal further details of the new craft's clean lines. Designed for fast economical operation over medium-length inter-city stages, the twin-engine, all-metal ship carries up to 48 passengers at cruising speeds of 180 to 280 mph. At 255 mph. and 12,500 ft., the Ambassador can carry 40 passengers and their luggage—a total payload of 8,400 lb.—more

than 1,000 miles. The British say that with a 40-passenger arrangement, and when flying over 400-mile stages at a utilization of 2,500 hr. a year, the Ambassador's direct operating costs should be no more than three cents a passenger mile. Using 2,600-hp. Bristol Centaurus engines, the plane has been reported by the British to have a single-engine rate of climb of more than 500 ft. per minute.



## Pilot Fatigue Seen As Cause of Crash

Possibility that the pilots of the Burke Air Transport DC-3 which crashed near Melbourne, Fla., last July 13 were asleep has been suggested in an official Civil Aeronautics Board report covering the mishap.

Evidence turned up in the investigation (AVIATION WEEK, Oct. 6) resulted in one of the most critical sets of findings ever issued by the Board in an accident case. Together with the ditching of American International Airways' flying boat in mid-Atlantic on Oct. 14, the Burke crash brought widespread condemnation of all passenger-carrying operations by uncertificated lines.

► **Service Halted**—Based at Miami and owned and operated by Andrew J. Burke, BAT reportedly stopped airline service following the accident.

CAB found that the pilots of the Burke DC-3 (bound from Newark to San Juan, P. R.) had flown more than 23 hours out of the preceding 37 hr. 45 min. and that they had little, if any, opportunity for rest on the ground. "There is no direct evidence in the record to indicate that the pilots were asleep, but under the circumstances it would not be surprising if they were," CAB said.

► **No Time to Act**—"In fact," the report continued, "it would be more surprising if while cruising on automatic pilot during the early morning hours they did not fall asleep. Little imagination is required to visualize the pilots sitting in the semi-darkness of the cockpit, fatigued by long hours of flying, actually asleep as the aircraft cruised on automatic pilot and gradually lost altitude. Then, either by virtue or loss of power in the left engine, or because of the very imminence of the crash itself, they awoke, confronted with an emergency which neither time nor immediately available power permitted them to correct."

The plane struck the ground in nearly level altitude and at a very low angle of descent. None of the safety belts in the aircraft, including those of the pilots, had been buckled. Of the 36 occupants, 12 passengers and the two pilots were killed.

► **Bad Carburetor**—CAB found that BAT had not kept proper records for maintenance and operation of the DC-3. The carburetor on the left engine and 10 sparkplugs from both engines were found defective. Additionally, the plane left Newark with an overload of 2,047 lb.

In summary, the Board said the probable cause of the accident was the pilots' flying for long periods of time without adequate rest, resulting in inability to remain fully awake and alert. A similar

## TWA Buys Connies

Purchase of 12 new sleeper-type constellations for use on overseas routes has been announced by TWA President LaMotte T. Cohu. Deliveries on the \$15,000,000 order will start in about six weeks, with the entire fleet to be available by June—in time for the summer travel peak.

As the sleeper-type planes are put into overseas service, TWA will return its older Constellations to the U. S. for domestic use. By June, the carrier will have 22 Constellations available for domestic operations plus the 12 new planes servicing international routes.

report, issued about the same time by Carl Dolan, aeronautical technical consultant for the Senate Interstate and Foreign Commerce Subcommittee on Aviation, also found "flagrant violations on the part of Burke air transport."

► **"Seeks Drastic Action"**—Dolan said the plane was in "very poor mechanical condition and by no means airworthy," adding that both pilot and co-pilot had reached a state of complete exhaustion while in flight. He agreed with CAB that the pilots may have been asleep at the time of the crash.

The Senate Investigator recommended drastic procedure, "If not criminal action," against the airline's management and said CAA inspectors should be censured for countenancing such operations. He called for a comprehensive investigation of lax non-scheduled and charter air carriers.

## Manufacturers Eye Plane Rental Plan

A government-financed corporation to buy transport planes and lease them to the cash-short airlines is being eyed favorably by part of the aircraft manufacturing industry.

To date, only the Glenn L. Martin Co. has taken a stand on the subject, but the Air Coordinating Committee, to which Martin submitted a plan, is studying and advancing the proposal in principle. One of the Martin plans calls for 80 percent financing of the proposed new corporation by the Reconstruction Finance Corp., the balance by private investors.

The new corporation would purchase planes of the operators' choice and lease them at a monthly rate calculated to amortize the cost—down to a residual value of perhaps 10 percent—at the end of five years. The lessee would hold an option to buy any or all planes at any

time at a price less paid-in rentals.

On a plane priced at \$325,000, the monthly rental would be \$7,000 to \$8,000, covering both return on investment and amortization. The exact rate would depend on the period of amortization, rate of interest on the RFC loan (about 4 percent) and a higher rate on the private loan.

## Domestic Carriers Earn \$712,000 in October

Operating profits aggregating \$712,000 in October have enabled the 16 domestic trunklines to trim their deficit for the first 10 months of 1947 to about \$9,880,000. On Oct. 31 last year, the carriers had an operating profit of about \$2,250,000.

The \$712,000 profit in October, 1947, compares with an operating deficit of about \$1,815,000 in the same month last year. But most of the loss in October, 1946, was caused by the TWA pilot strike.

American Airlines made the largest operating profit in October, 1947, earning \$565,449 on a 71 percent passenger load factor. Also in the black were Braniff, Chicago & Southern, Inland, Mid-Continent, Northwest, PCA, TWA and United. Eastern, \$183,000 in the red, was the biggest loser during the month. Sizable losses for the industry as a whole are expected in November and December, with American and United furthest in the red.

## Santa Fe Skyway Denied New Rights by CAB

Santa Fe Skyway, wholly-owned subsidiary of the Atchison, Topeka and Santa Fe railroad and one of the largest airfreight lines in the country, has been denied authority to operate on a scheduled common carrier basis.

In turning down Santa Fe's application for a letter of registration under section 292.5 of the Economic Regulations, CAB found that the contract carrier had not filed a proper request for a certificate of public convenience and necessity by the May 5, 1947, deadline. CAB said that even if Santa Fe were to qualify for registration as a noncertificated cargo line under section 292.5, scheduled common carrier operations by the company would be in violation of the Civil Aeronautics Act unless (a) the railroad divests itself of the airline's control within the meaning of Section 408 of the Act, or (b) prior Board approval is obtained for acquisition of Santa Fe Skyway's control by the railroad under Section 408.

The Board said issuance of a letter of registration to Santa Fe Skyway prior to settlement of the issue of control would not be in the public interest.

## SHORTLINES

► **American**—Grounding of its 35 DC-6s plus delays in deliveries on an order for 100 Convair 240s will force the carrier to begin gradual layoffs of 103 co-pilots and 218 ground personnel starting Jan. 1. Most of the employees will be rehired when the DC-6s return to service and Convairs become available.

► **American Overseas**—Aircraft and plant maintenance and stores activities of American Airlines and AOA in the United States will be consolidated Jan. 1. About 600 AOA employees at the New York base will be transferred to AA in the integration, but no layoffs will result. The move does not affect AOA maintenance employees in Europe.

► **BOAC**—Inauguration of New York-Bermuda service on a thrice-weekly basis and operation of both its Baltimore-Bermuda and New York-Bermuda routes with Constellations effective Jan. 15 has been announced by company officials. Use of Constellations will enable BOAC to cut in half the flight times between Baltimore and Bermuda now maintained with Boeing 314A Flying boats.

► **Capital**—Improved its net current position by \$48,560 during November despite an operating loss of \$69,356 and a net loss of \$132,918. Net loss in November, 1946, was \$484,430. Total expenses were cut from \$1,756,874 in October to \$1,704,564 last month, revenue declined from \$1,904,855 in October to \$1,635,207 in November.

► **Northeast**—Has placed a DC-3 in all-cargo service.

► **Eastern**—Reports pre-christmas traffic from New York to Miami and other southern points reached a new high. . . . Carrier expects to start regular service to Atlantic City, N. J., through Pomona Naval Air Base within 60 days.

► **KLM**—Planned to place Constellations on its Amsterdam-Johannesburg, South Africa, service late this month.

► **Los Angeles Airways**—Expects to begin service on its third helicopter mail link around Jan. 10. Two trips daily are to be made between Los Angeles Airport, the terminal annex post office in downtown Los Angeles, and the cities of Compton, Bellflower, Anaheim, Santa Ana, Orange, Newport Beach, Huntington Beach, Long Beach, Wilmington, San Pedro, Torrance and Redondo Beach.

► **National**—Has raised dispatchers' pay \$25 a month in all brackets. Contract negotiations with the AFL Radio Officers Union have been resumed following union withdrawal of a 30-day strike notice filed Nov. 22 with the National Mediation Board.

## CAB SCHEDULE

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

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

Jan. 19. Hearing on requests of Braniff and Chicago & Southern for removal of restrictions on Chicago-Houston service. (Docket 1681 et al.)

Jan. 27. Hearing on Taca, S. A., foreign air carrier permit renewal and amendment case. (Dockets 3016 and 3017.)

Feb. 3. Hearing on Board's investigation of airfreight rates. (Docket 1705 et al.)

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

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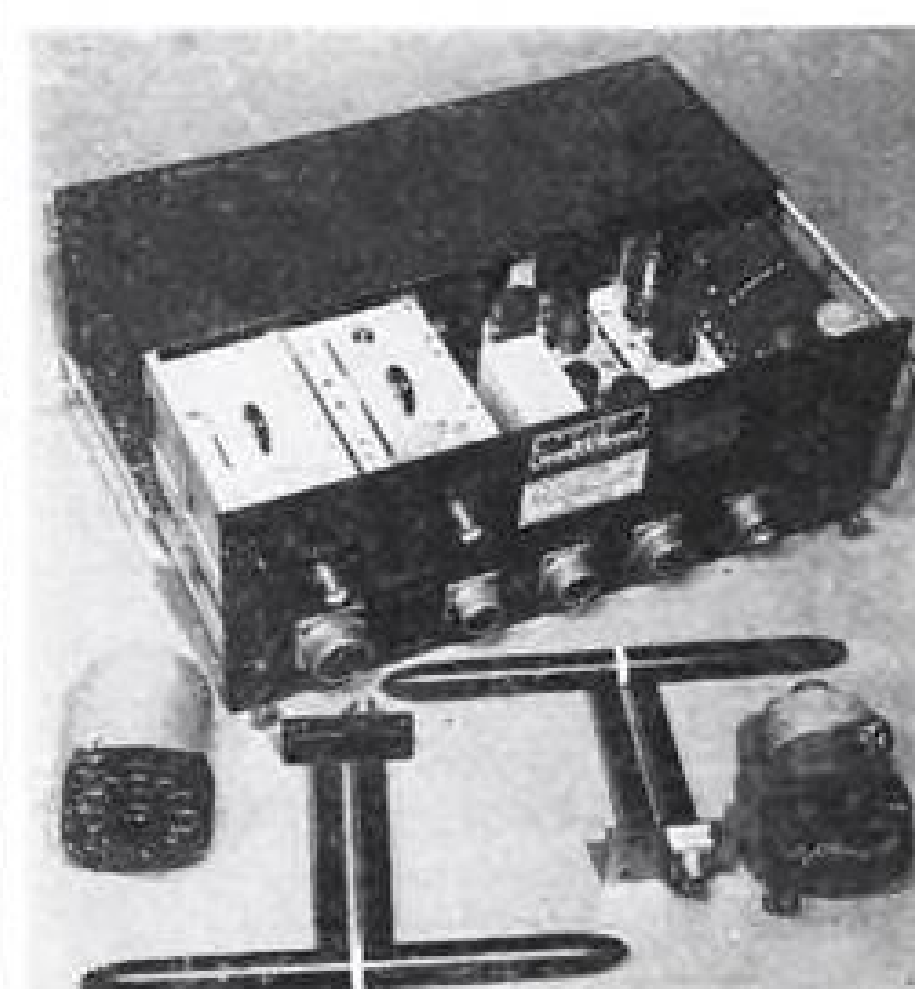
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# A Thing Called Progress

From reports which have arrived since the editorial on stall warning indicators appeared on this page, it would seem that everyone favors such devices in principle but few have the courage of their convictions. From all appearances, the public relations job that manufacturers of stall warning indicators have before them in this unenlightened business is appalling. Progress, it seems, is fine—for the other fellow.

The odyssey of one stall warning indicator, recounted below, is a discouraging commentary on the mentality of what is generally considered an enlightened segment of America—the private pilots and instructors. The index to the CAA attitude is no surprise, however.

The weaver of the true tale is James Johnson, operator of Springfield (Mo.) Flying Service.

"With a great amount of interest I read your editorial on the stall warning indicators. Our first information on this instrument had come in the form of an engineering newsletter by Aero Insurance Underwriters. I sent and got one. Then my troubles began. It seems they might be similar to that of other operators, so I will outline the complete story, step by step."

The instrument was bought early this year. Johnson instructed his shop foreman to install it on a Cessna 120, and forgot it. Some time later he remembered, and learned it still was not on the plane.

"Here is problem one. Mechanics are opposed to new gadgets. They feel a change is always uncalled for. Also, since a change always means new CAA red tape, and the paper work that goes with it, they have no desire to do anything along that line. All mechanics, as a rule, detest paper work. The CAA even encourages it, so we operators are rapidly becoming as involved in it as the government. The only difference is that we are not supported by taxes!"

Johnson, however, finally accomplished the installation. Then problem two reared its head. None of the instructors would use it. They said the horn frightened the students or at least "rattled" them to the point where their landings were impaired. No amount of sales argument on Johnson's part could change their minds. In their estimation the indicator was a flop, unnecessary equipment and uncalled for in student training.

So the progressive, safety-minded fixed base operator decided to bide his time and wait for his instructors to "warm up" to the indicator.

"By midsummer it was warm enough but there was no indication they would change their minds," he says. "In fact, I found out by flying the airplane that they had removed the fuse so it could not be used.

"I came to this conclusion. We are still in the hands of pilots who fly by the seats of their pants. They do not want their students to learn otherwise. If memory serves me right, instructors have always been opposed to changes in instruction methods. This instrument inspires no exception.

"The third and final act happened last Thursday. All

maintenance sheets on our flight equipment require my signature before going into the cost accounting. I noticed a sheet on Cessna NC-77428 that really opened my eyes. It read "removed stall indicator." I immediately called the shop foreman to the office for further particulars. Here's what I found.

"The CAA aircraft inspector had been in on his monthly inspection tour. We look forward to these visits just like a kid would the first day of school. The inspector had wanted to know if we had any airplanes with stall warning indicators and if so they must be placarded to the effect that the instrument was not to be used until the CAA engineering department had inspected the installation, flight tested the airplane, and 'zeroed it in.' That last expression is a new one on me but he used it."

So here is how Johnson's shop foreman sized up the picture. He had been against the gadget in the first place. The instructors wouldn't use it after it was finally installed, and now CAA was opposed to its being on the airplane. Furthermore, thought the foreman, the plane was then going through an annual inspection, and since the instrument was not approved factory equipment, he had no right to leave it in the airplane without submitting it to the CAA for their engineering tests. So why not make it easy for everybody and take it out. He did!

"So," says Johnson, "the instrument and its installation cost about \$50. I had trouble getting it installed. The instructors would not use it after it was. The shop foreman couldn't legally leave it installed without engineering tests since it is not approved equipment and, besides, the CAA inspector said it could not be used without approval of their engineering section. I got a licking all round, just for trying to improve the safety of flight instruction and adding a safety factor to the operation of the plane."

Now, Johnson asks:

"Does the right hand know what the left hand is doing? Who is saving aviation for whom and for what? Why should we operators be concerned about anyone's neck? Apparently the instructor isn't.

"There is a report of the last meeting of the non-scheduled Advisory Committee on my desk. They give unanimous approval to the safe flight instrument. In your editorial you endorse and recommend its use. Do you know where CAA stands on the issue?"

"Our main task in aviation is one of education. Ever since I got in the game in 1927 I have spent 75 percent of my efforts in selling aviation, to trying to educate my prospects so they could understand what flying is all about. Unfortunately, most of our efforts on education are not appreciated. We find ourselves much in the same position as the missionaries except that, so far, no cannibal has boiled us in a pot.

"There is now one used stall warning indicator on our stock shelves where I had expected to have several new ones, selling readily to an eager and appreciative group of plane owners. I can't keep from wondering, why?"

"It makes me wonder how many of us now flying will not be present a year from now because of an unnoticed stall, one that could have been prevented by one of these indicators. How many of these unfortunate flyers will be among those opposed to using such an instrument? How many of those opposed have any excuse other than their pride? For myself, pride has no priority on my neck. There is a used stall warning indicator on our stock shelves that I wish to hell was still in that airplane."

Johnson's story is a powerful argument for a concentrated safety education program backed by every segment of private flying.

ROBERT H. WOOD

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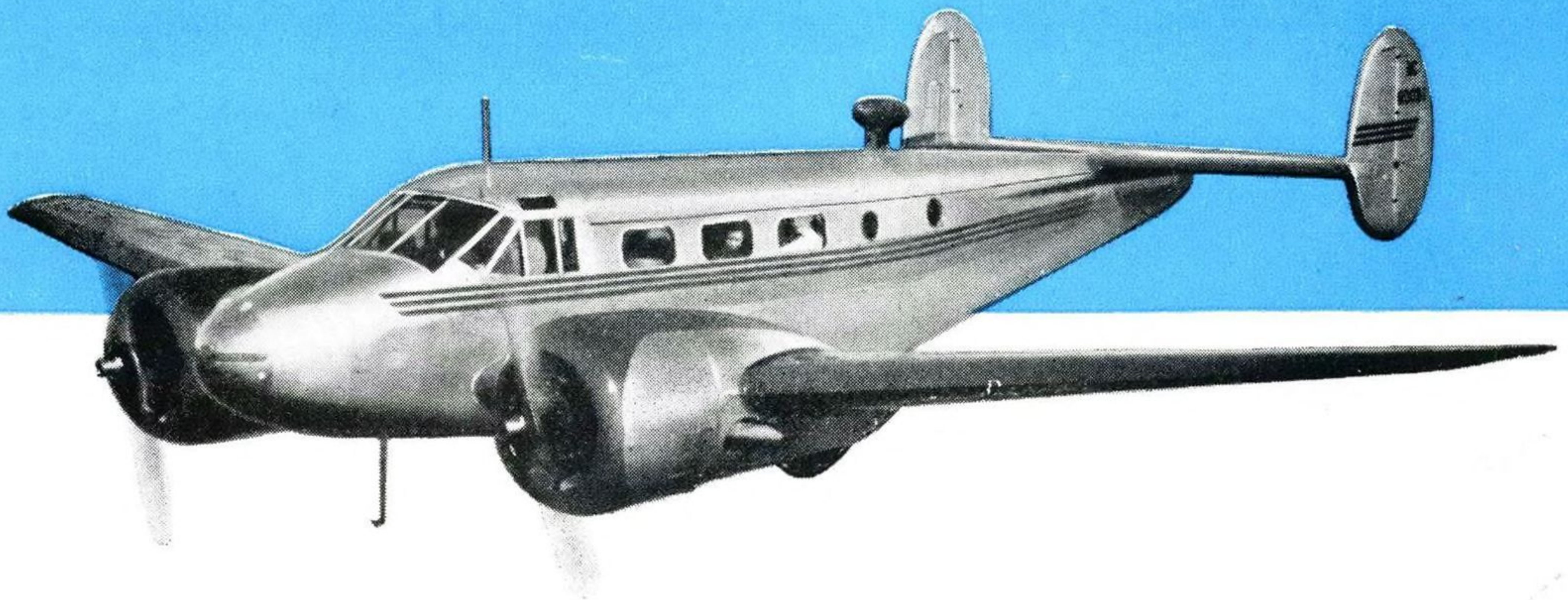
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