

AVIATION WEEK

A MCGRAW-HILL PUBLICATION

DEC. 1, 1952

50 CENTS



Look quickly . . . it's a COUGAR!

You need a fast eye to catch the Navy's new GRUMMAN COUGAR in flight. Notice the pluming vapor trails formed by fuel jettisoned from auxiliary wing tanks. Cougar pilots dump extra fuel as a safety factor prior to engaging in combat and before returning to their base. A swept-wing successor to the battle-proved PANTHER, this powerful turbo-jet fighter is now moving off production lines to active operation with the Fleet . . . next move Korea.

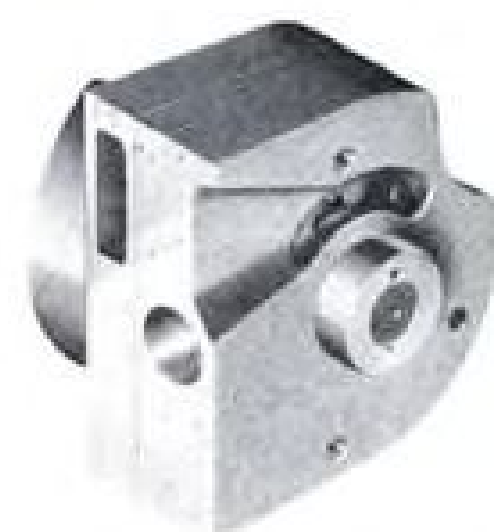
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Single
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Triple
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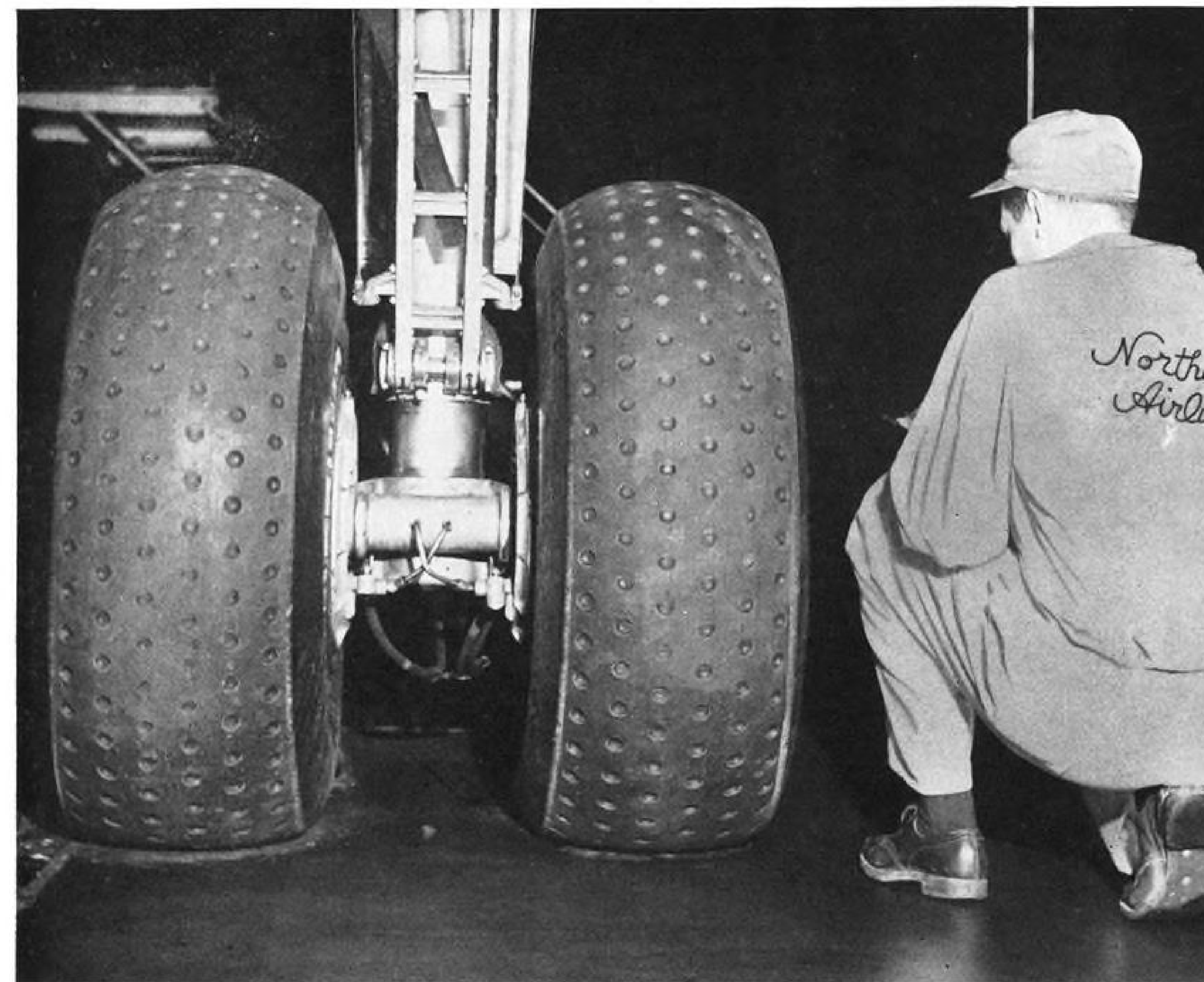


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B.F. Goodrich



20% more landings with new B. F. Goodrich dimpled tire

THE NEW B. F. GOODRICH airplane tire has a stronger cord body and new wear-resisting tread with dimple-like indentations in the rubber. These dimples provide better distribution of the tire load and reduce exposure to tread cutting. The tread design is a complete departure from conventional ribbed treads.

Northwest Airlines has complete performance data on all types of tires. When B. F. Goodrich introduced the new tire, it was quickly added to their test programs. As comparative records

of dimpled tires began to come in, the results were impressive. Northwest engineers found it gave them 20% more landings per tire than the next best tire tested, recommended adoption of the new tire as standard equipment.

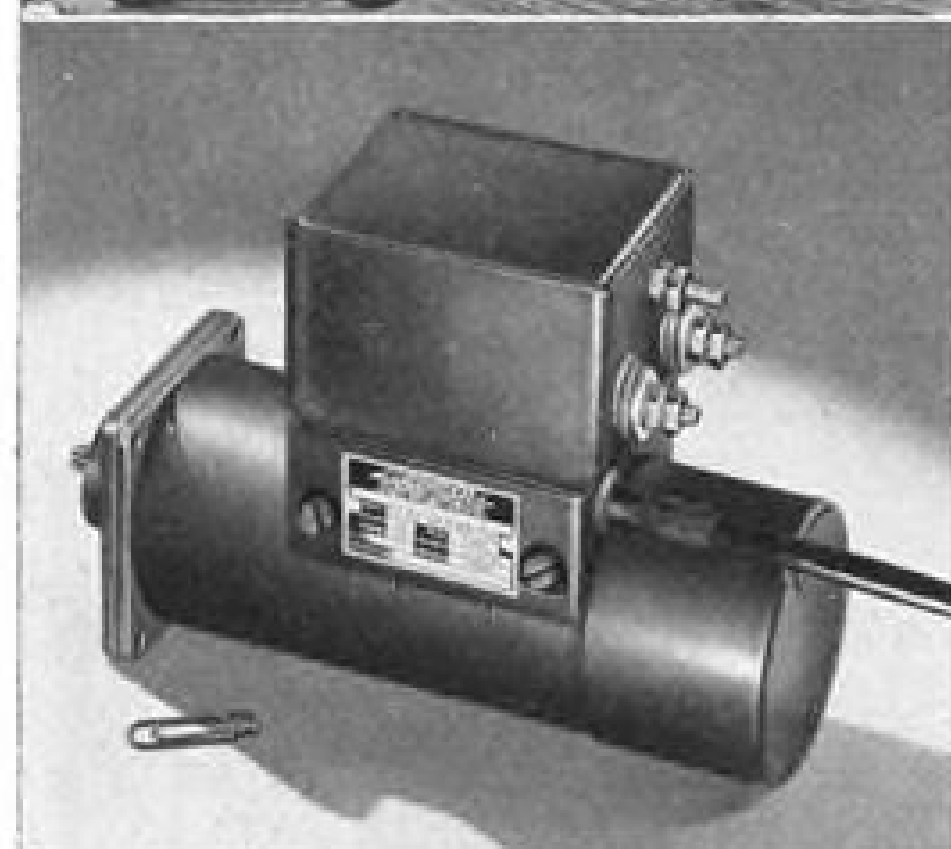
There are now 24 airlines who have switched to dimpled tires. Northwest's report on the service with this tire is typical of many others operating on both U. S. and overseas airports.

B. F. Goodrich is now producing the dimpled tire in seven sizes. The new, longer wearing tire is another example

of BFG's leadership in rubber research and engineering. Other B. F. Goodrich products for aviation include wheels and brakes, heated rubber, De-Icers, Avtrim, Plastilock adhesives, Pressure Sealing Zippers, inflatable seals, fuel cells, Rivnuts, accessories. *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

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Airborne offers two sizes of motors for applications requiring 26 volt, intermittent duty operation. Both sizes feature magnetic clutch and brake for quick stopping and positive holding during "power off" periods.

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Normal 26 volt D.C. ratings for 1 minute on, 10 minute off, duty cycle, with-out filter.

model	dia.	h.p.	r.p.m.	wt.-lb.
E-2500	2.5"	.75	8000	5.4
E-3000	3.25"	1.25	7000	8.25

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ACCESSORIES CORPORATION
1414 Chestnut Avenue, Hillside 5, N.J.

Aviation Week



Volume 57

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AVIATION WEEK, December 1, 1952

IMPROVED PERFORMANCE for AIR LIFTS and AIR DROPS



SHORT FIELD TAKE-OFFS and landings made possible by greater wing surfaces and newly designed flaps...permitting operation from fields with limited take-off distance and obstacles.



SLOWER DROP SPEEDS...stability and control under all phases of "slow flight" exceed all military specifications, permitting more accurate and safer dropping of personnel, supplies and equipment.



DIFFICULT LANDINGS...under all combat conditions...on rough forward air fields...made possible by specialized rough field landing gear design...another new feature of the Fairchild C-119H.

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Increased Wing Surfaces • Larger Flight Control Surfaces
Improved Stability and Control • Increased Payload and Better
Cargo Distribution • Greater Combat Range • Lower Stall and
Jump Speeds • Shorter Take-Offs and Landings • Greater Tail
Clearance • External Fuel System • More Efficient Heating System
Rough Field Landing Gear • Crew Bail-Out Chute

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NEWS DIGEST

Domestic

Air Force last week confirmed that contracts for the Lockheed F-94C all-weather interceptor had been substantially cut back (AVIATION WEEK Nov. 24, p. 14). In confirming AVIATION WEEK's exclusive story, USAF said the F-94C program had been reduced by 35%. Contracts for all work not in progress have been canceled, but production work already under way will be continued, with final phaseout scheduled for the spring of 1954. USAF said the F-94C was being phased out because more advanced all-weather interceptors would be available in quantity to meet operational requirements.

Air Force is conducting a special investigation of the four fatal C-119 crashes but has no plans to ground the plane. The only crash known to have resulted from mechanical failure reportedly developed from propeller trouble; one engine fell out of this plane before it crashed near Billings, Mont. The other three accidents may all have been navigational errors. Two hit mountains, one in Korea and the other in Alaska; the remaining plane was reported missing on a flight Nov. 15 during a period of bad weather in Alaska.

Louis H. Crook, who was professor of aeronautical engineering at Catholic University, died in Washington Nov. 19. A multi-million-dollar suit, involving an ignition-shielding device that made possible the use of radio in planes, which Crook had instituted against the government, still is unsettled.

An Air Force Douglas C-124 Globemaster was presumed to have crashed Nov. 23 near Anchorage, Alaska, while on a flight from McChord AFB, Tacoma, Wash., to Anchorage; 52 persons, principally Army and Air Force personnel, were aboard.

Navy Panther jets shot down two Russian-made jet fighters Nov. 18 in the Sea of Japan just a few seconds flying time from U. S. Task Force 77.

Pan American Airways trans-Pacific Strato-cruisers will begin routine west-to-east flights in December, taking advantage of jet stream winds which are steady from Nov. 15 to Apr. 15, on trips from Tokyo to Honolulu. A Strato-cruiser flew this 3,950-mi. route nonstop Nov. 19 in 11½ hr.

Beech Aircraft Corp., Wichita, will



HARMON TROPHY is presented by President Truman—for aviation achievements—to (left to right): Mrs. Jacqueline Auriol, daughter-in-law of France's president and

holder of the women's speed record; Navy Lt. Carl J. Seiberlich, who was cited for anti-sub warfare developments, and Charles F. Blair for flight over North Pole in a P-51.

build a substantial number of new photographic planes for the Navy. Designated the SNB-5P, the new plane will be a military version of the Beechcraft Model 18.

June 30. A dividend of 12½ cents a share on its 5% preferred stock was declared payable Dec. 31 to stockholders of record Dec. 20.

AiResearch Manufacturing Co. of Arizona has been awarded the McGraw-Hill Publishing Co.'s national citation "for the construction of a significant new industrial plant in 1951-52." The firm's new \$5-million building in Phoenix was one of seven plants in the country selected by McGraw-Hill's "Factory Management and Maintenance" magazine for this award.

The Garrett Corp., Los Angeles, has declared a quarterly dividend of 40 cents a share, payable Dec. 20 to stockholders of record Dec. 5. A net profit of \$661,346 was reported for the quarter ended Sept. 30. Combined backlog of the Los Angeles division and the AiResearch division in Phoenix was about \$140 million.

Pan American's new collective bargaining contract with its pilots went into effect Nov. 1, extends through Apr. 1954. Contract calls for an increase in pay for captains and co-pilots of 10½%, retroactive to June 1.

Atlas Corp. declared a regular quarterly dividend of 40 cents a share payable Dec. 20 to stockholders of record Nov. 29. In addition, a special dividend of 1/50 of a share of Airfleets, Inc., common stock per share of Atlas common stock, will be payable Jan. 5 to holders of Atlas stock Nov. 29.

Aircraft Industries Assn. reports 46 civil aircraft weighing 6,000 lb. and less were exported to foreign countries during the month of October. These aircraft had a value of \$520,835; half went to Mexico and Canada.

International

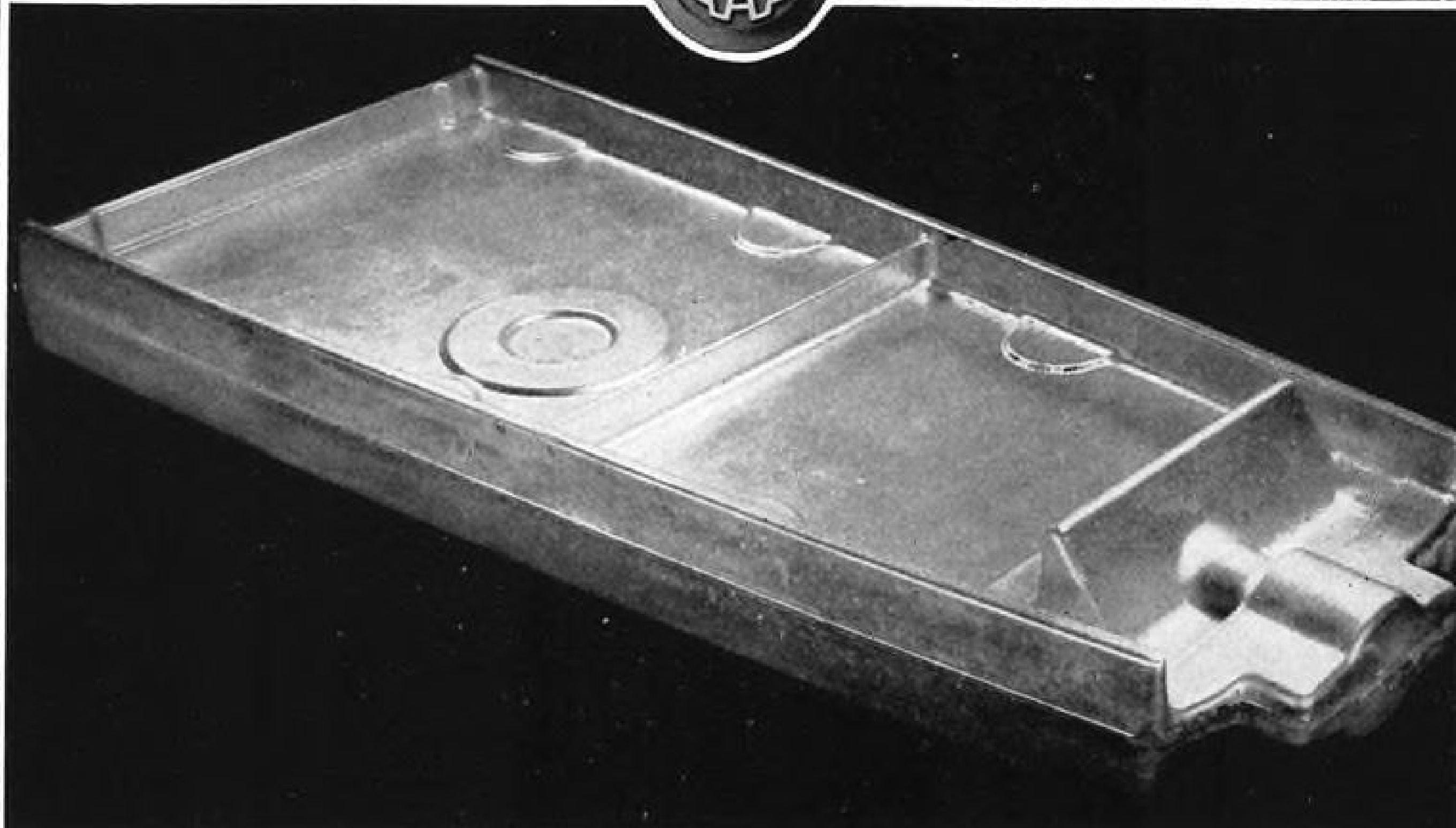
International Air Transport Assn. reports airline traffic transactions put through clearing house in London during September amounted to \$21,060,000, a new record for monthly turnover.

Financial

The Sperry Corp. has declared a quarterly dividend of 50 cents per share, payable Dec. 17 to stockholders of record Dec. 3.

Lear, Inc., reports a net profit of \$426,000 for first half of 1952, ending

Thomas A. Morgan, retired president and chairman of the board of Sperry Corp., was nominated Chevalier of the Legion d'Honneur by the French government for services contributed in both world wars in a ceremony in New York Nov. 24.



Are you taking full advantage of the constantly growing range of forgings?

Typical is this aluminum alloy forging with a projected area of more than 1,000 square inches used in the wing structure of a modern military bomber. Such forgings are today made possible by the use of the largest die forging press in America (18,000 tons). For hammer or press die forgings of aluminum, magnesium or steel, Wyman-Gordon engineers are ready to serve you—there is no substitute for Wyman-Gordon experience.

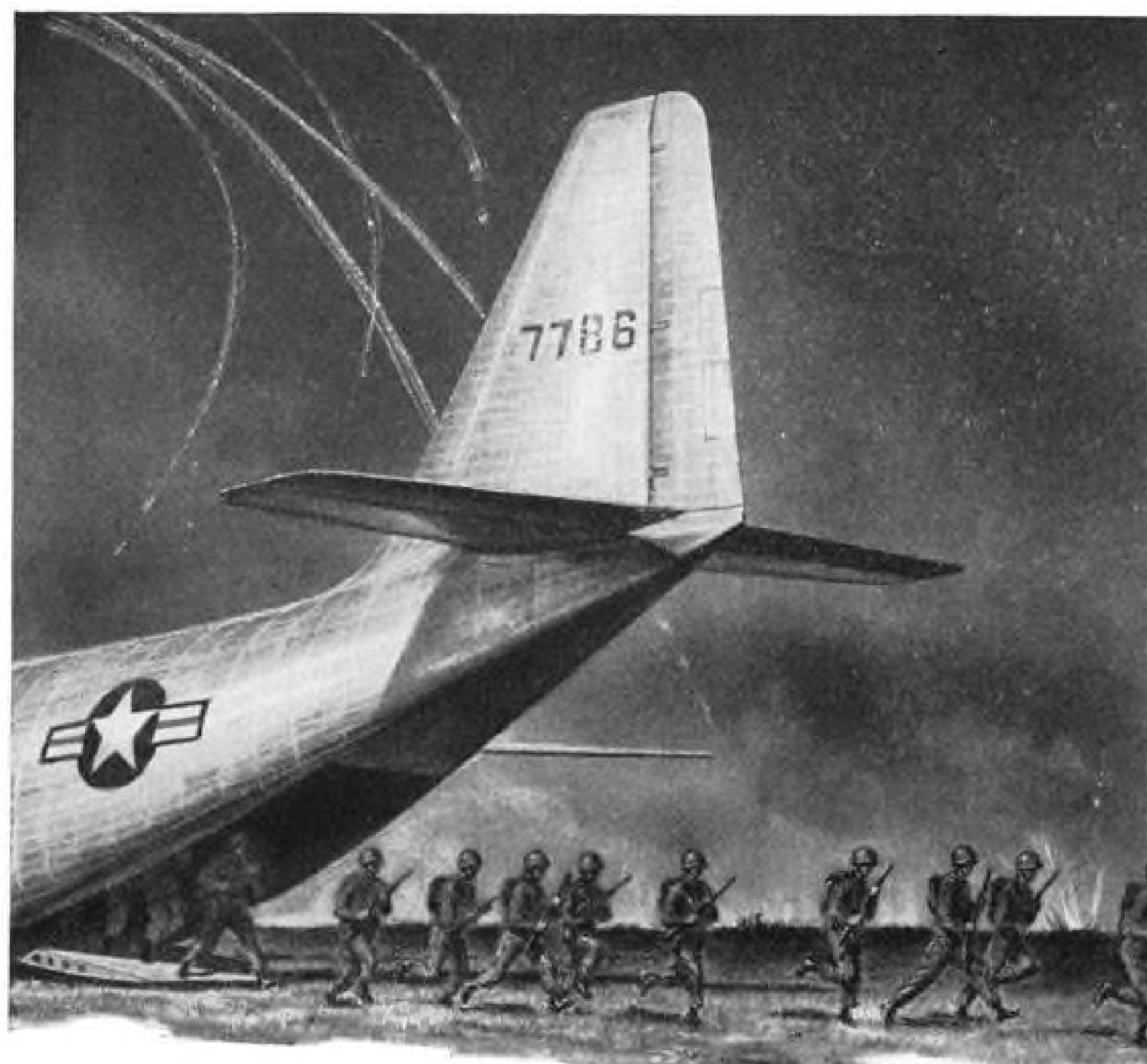
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Touchdown and GO!

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But this answer was not found by modifying existing planes; such attempts failed miserably. Chase planes are designed especially to provide the answer. They represent a noble accomplishment by the Air Force-Army-Chase team—an accomplishment which replaces, as the primary means of delivery, the less reliable, more costly, more hazardous techniques which were developed for interim use.

Delivery of troops is fast, safe with Chase planes. It's touchdown and **Go!**



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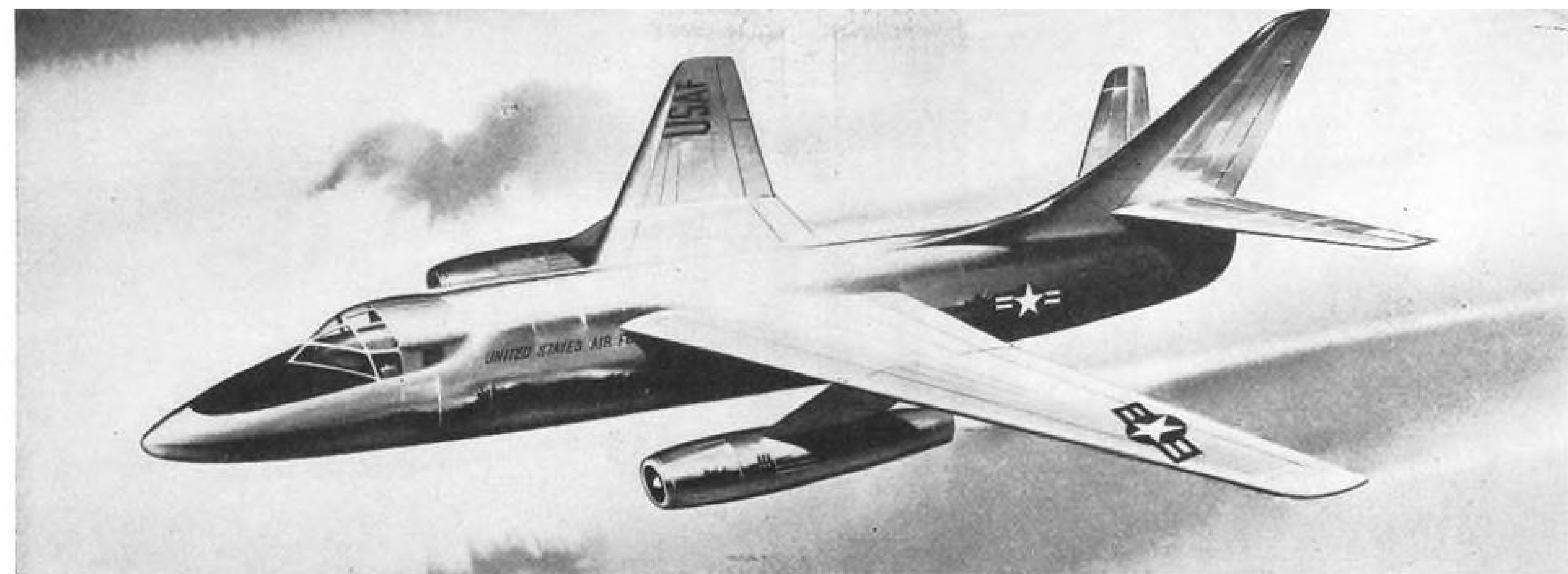


AVIATION CALENDAR

- Dec. 1—Fourth annual Air Cargo Day, (ASME), Hotel Statler, New York, N. Y.
- Dec. 2—Symposium on light metal heavy forgings and extrusions for aircraft, SAE, ASME, IAS and AIME, Hotel Statler, New York.
- Dec. 2-5—Aviation Distributors and Manufacturers Assn. tenth annual meeting, The Kenilworth, Miami Beach.
- Dec. 3-5—American Rocket Society, Hotel McAlpin, New York, N. Y.
- Dec. 3-5—Society for Experimental Stress Analysis, annual meeting, Hotel McAlpin, New York.
- Dec. 3-5—American Management Assn., Hotel Statler, Cleveland, Ohio.
- Dec. 4-6—Sixth annual Arizona Aviation Conference, Douglas, Ariz.
- Dec. 12—Second Convertible Aircraft Congress, The Franklin Institute, Philadelphia.
- Dec. 17—Annual Wright Bros. dinner, 7:30 p.m., Statler Hotel, Washington, D. C. Wright Bros. lecture to be presented by IAS 3 p.m., U. S. Chamber of Commerce auditorium.
- Jan. 12-16—Annual meeting and engineering display of Society of Automotive Engineers, Sheraton-Cadillac Hotel, Detroit.
- Jan. 14-16—AIEE-IRE-NBS conference on High Frequency Measurements, Statler Hotel, Washington, D. C.
- Jan. 19-23—Plant Maintenance Conference, Public Auditorium, Cleveland, O.
- Jan. 19-23—Winter general meeting of the American Institute of Electrical Engineers, Hotel Statler, New York, N. Y.
- Mar. 25-27—National Production Forum of the SAE, Hotel Statler, Cleveland, O.
- Mar. 31-Apr. 2—First International Magnesium Exposition, National Guard Armory, Washington, D. C.
- Apr. 4-12—Second annual International Motor Sports Shows, Grand Central Palace, New York, N. Y.
- Apr. 20-23—Aeronautic Production Forum, National Aeronautic Meeting and Aircraft Engineering Display (SAE), Hotel Governor Clinton and Hotel Statler, New York, N. Y.
- May 11-13—IRE National Conference on Airborne Electronics, Dayton Biltmore Hotel, Dayton, O.
- May 18-22—Fifth National Materials Handling Exposition, Convention Hall, Philadelphia.
- June 9-11—Second International Aviation Trade Show, Hotel Statler, New York, N. Y.

PICTURE CREDITS

7—Wide World; 9—(Minijet) INP; 12—Wide World; 13—USN; 15—(Cocquyt) Studio Max; (Lindberg) Ted Gurney; 16—de Havilland Aircraft of Canada; 17—Wide World; 18—McGraw-Hill World News; 28—USN; 42—Hydropress; 56—Wide World; 71—Piasecki; 72—(bottom) USAF.



DOUGLAS RB-66—An artist's sketch (above) of new twin-jet USAF sweptwing bomber which is scheduled to be powered by two Allison J71s slung under the wings. Navy version, XA3D-1, has started its flight test program at Edwards AFB.

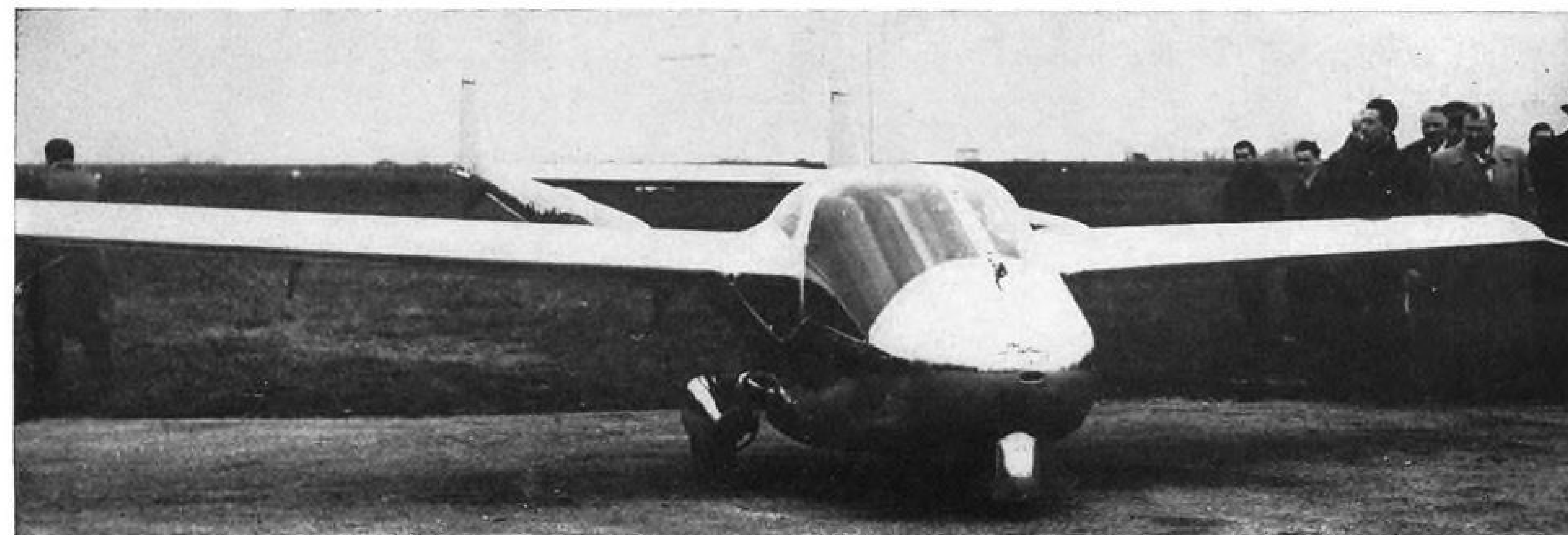
New Aircraft In the News

LOCKHEED P2V-6—Versatile new model Neptune (right) does a variety of jobs for Navy, is 12 in. longer than previous P2Vs, has pressure fueling and stainless steel engine nacelles. Powerplants are Wright Turbo-Compounds.



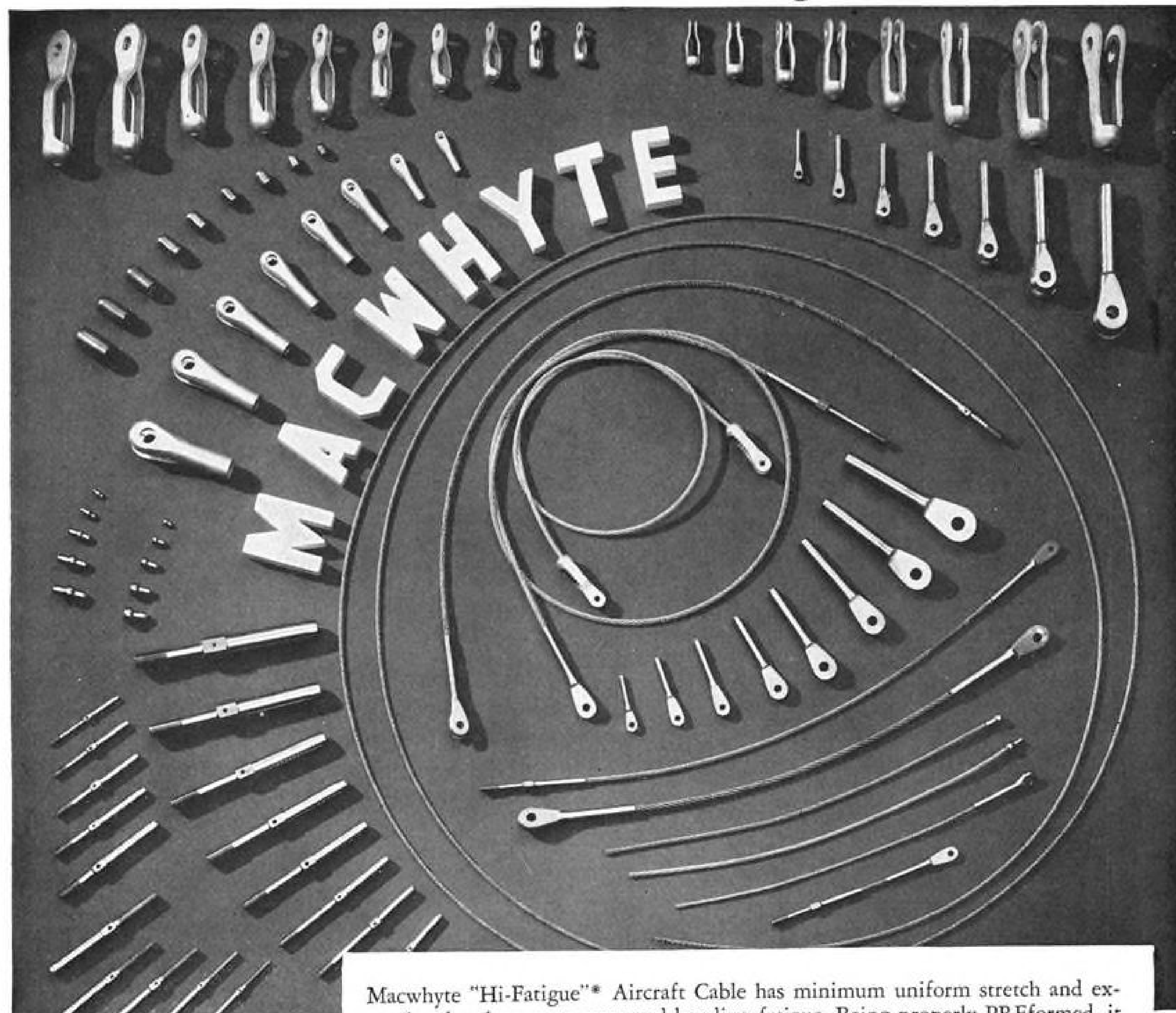
BAUMANN BRIGADIER—First production Brigadier (left) undergoes flight tests for type certificate approval. The five-place pusher has piled up more than 100 hr. of flight time. Baumann Aircraft Corp., Pacoima, Calif., is also negotiating with foreign firms for production of the plane abroad. Powered by two 145-hp. Continentals, the Brigadier has a top speed of 175 mph. and a 750-mi. range with 730-lb. payload.

SIPA 200—Two-seat French Minijet jet lightplane (below) began its flight trials recently near Paris. Weight is under 1,600 lb. and it is powered by a Turbomeca Palas turbojet of about 300 lb. thrust. The Minijet has retractable landing gear.



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1018A

WHO'S WHERE

In the Front Office

M. (Kip) Tuttle has been elected a vice president of Radioplane Co., maker of target drone aircraft, Van Nuys, Calif. Tuttle, for the past year the company's director of military relations, will continue this responsibility in his new post.

C. T. Everett, vice president and general manager of Bingham-Herbrand Corp.'s Aviation division, has been appointed assistant general manager of the firm's Fremont, Ohio, operations, which include the Herbrand Forging division and Aviation division. The latter makes jet engine buckets and blades.

Arnold Rosenberg has joined Kearfott Co., Inc., Little Falls, N. J., as assistant vice president. The firm makes aviation instruments and navigation devices. He formerly was general sales manager for Bendix Radio Communications division of Bendix Aviation Corp.

Robert A. Ebert has been named administrative assistant to the vice president of Northwest Airlines and assistant to the carrier's president. He joined NWA in 1943.

Changes

Charles A. Egger has joined California Central Airlines in the new position of administrative assistant-management, dealing with legal matters.

Ralph L. Ravenscraft has been placed in charge of subcontract technical service and liaison and dimensional control functions for Goodyear Aircraft Corp.'s Production Engineering Department, Akron, Ohio.

Edgar Schmued, formerly assistant chief engineer-design for North American Aviation, Inc., and now vice president-engineering for the Aircraftman Co. has been appointed technical assistant to the president of Northrop Aircraft, Inc., Hawthorne, Calif.

F. Clark Cahill has been designated chief engineer of the engineering and production division of Airborne Instruments, Inc., Mineola, L. I., N. Y.

Clyde W. Seymour has been named assistant manager, manufacturing division, Solar Aircraft Co., San Diego, Calif. W. Robert Bruce has been designated manager of production control.

Kenneth R. Jackson has been named head of the electro-mechanical development laboratory of J. B. Rea Co., Inc., Los Angeles and John G. Zisch has been appointed assistant business manager.

Group Capt. Christopher Clarkson has been appointed technical consultant in the North American area for British European Airways, Vickers-Armstrongs Ltd., Dowty Equipment Ltd. and Helliwell Ltd. Clarkson will have offices at 459 Fifth Ave., N. Y. C.

Robert S. Scott has joined Airwork Corp.'s Service Department, Millville, N. J., as a field representative.

G. Krause has been named chief designer of Loewy Construction Co., N. Y. Hydro-press, Inc., subsidiary, in charge of the USAF heavy press program.

INDUSTRY OBSERVER

► Aircraft industry is expected to hit a post-Korean production peak in December, delivering slightly more than 1,000 aircraft to the military services. This compares with a production rate of about 200 aircraft a month when the Korean war began.

► Sabre pilots recently returned from Korean combat against the Russian MiG-15 take sharp issue with Pentagon brass on where unnecessary complexity begins to impair performance of combat aircraft. The MiG Alley veterans cite the following equipment items as examples of what could be eliminated from current F-86 models to improve combat performance: armor plate in front of the pilot (It's the armor protecting the pilot's back that counts in jet combat); pneumatic gun chargers (A ground safety device not worth the added weight and complexity over a manual-charging system); self-sealing gas tanks (MiG cannon shells tear holes too big for sealant to close; and one of the three landing gear actuating systems (Pilots feel two systems give them all the safety they need—the third is excess baggage).

► CAA Administrator Charles Horne reports personal flying has sunk to its lowest level in many years. Applications for student pilot licenses dropped by 15,000 during the first eight months of 1952 compared with last year. Only 10,217 private licenses have been issued this year compared with 17,402 for the same period of 1951.

► Recent General Electric jet-engine conference (AVIATION WEEK NOV. 2, p. 11) gave the airline engineers their "first significant data on jet engine service life and usage problems," according to one airline official who attended. GE presented data obtained from its USAF-sponsored J47 in-flight service tests conducted in a B-45.

► Trend toward delta wing designs for the next generation of really high-speed fighters capable of operations at Mach 2 is increasing among U. S. aircraft firms. Lockheed, North American and Republic are the latest to be working on this type of design that was pioneered in Germany and first fully developed by Convair. U. S. delta philosophy aims at a thin wing for speeds of Mach 2 while British designers are exploiting the advantages of a much thicker delta with speed limitations barring performance much over Mach 1.

► UAT, French nonscheduled airline, has beaten its nationalized rival, Air France, onto the de Havilland Comet 3 production line. UAT recently exercised an option to buy a trio of series 3 Comets, getting a place on the order list just behind Pan American and BOAC. UAT also ordered earlier model Comets before Air France which has not yet exercised an option it holds for purchase of six Series 3 Comets.

► Air Force Secretary Finletter reports USAF increased the number of planes assigned to its operational units (Tactical, Strategic, Air Defense, Troop Carrier and MATS) by 33% in the 21 months after the outbreak of the Korean war. Inventory of planes in storage (World War II types) decreased by 60% during the same period mainly due to transfer to MDAP countries, Korean combat and salvage.

► CAA is readying its first terminal-type omni-directional ranges (TVOR) for airline and private pilot use at Oklahoma City and Toledo. Data on TVOR use will be published shortly by CAA, opening the way for establishment of operational procedures. Ten more TVOR units are scheduled for installation, including one at Washington National Airport. CAA estimates total cost of TVOR installation at about \$15,000 compared with \$90,000 for a standard omni-directional range (VOR).

► Jet transports won't be able to avoid troublesome weather by cruising at 40,000 feet. American Airlines' Capt. Gene Beattie is reported to have encountered a front at 47,000 ft. while flying the B-45 used by General Electric to flight test new jet engines.

AVIATION WEEK, December 1, 1952

Washington Roundup

New Secretary of Defense

Here are some basic concepts of General Motors Corp. President Charles E. Wilson, indicating the trend of the mobilization program when he takes over as Secretary of Defense:

► **Minimum Stockpiling**—Wilson isn't likely to go along with an air power program to match Russia plane for plane or tank for tank. He takes issue with such defense spokesmen as elder statesman Bernard Baruch and Sen. Lyndon Johnson who put great importance on "numbers" of planes and other weapons in-being and ready for action. Wilson's comment: "Stockpiling of equipment and arms is a doubtful defense measure because of the never-ceasing technical development of military equipment."

► **War - Peace Plants** — The U.S. must maintain a gigantic war productive capacity which could start rolling out weapons at the push of a button as long as the threat of war hangs overhead, Wilson believes. The way to accomplish this, he proposes, is with "dual-purpose" plants. Two examples, he suggests, are a plant able to produce jet engines and automobile body stampings, or a plant for assembly of aircraft and automobiles. The plants would have facilities common to both types of production and facilities special for each type of production. Workers could be promptly switched from one type of output to the other.

Wilson observes: "Under the dual-purpose plan, there would be no plants standing idle without competent custodians at times when they were not being used for war production. The ability to convert quickly to war production would be preserved. Of great importance, also, the properties could be quickly and flexibly converted back and forth from one purpose to the other without great expense."

He wants legislation authorizing long-term contracts to civilian producers for maintaining special war production facilities in their plants, and keeping them up to date.

► **Technological Progress**—Wilson views technological advance as the key to an effective military machine. Strong emphasis on research and development for improved manufacturing techniques, as well as improved planes and other weapons, is expected in his regime.

► **Decentralize Operations**—The current trend toward "unification" of the military services and increased authority and responsibility for the top-level office of



Charles Erwin Wilson

Secretary of Defense runs counter to Wilson's concept of effective organization. He might bring pressure to reverse it.

Under his presidency, the top-level management at GM has confined itself to making overall policy and acting as "coordinator." The corporation's 40-odd divisions have been left pretty much on their own. Each division designs, develops, manufactures, merchandises and advertises its own product. Each makes its own purchases—from other divisions or outside sources as it chooses. Each hires and trains its own employees and maintains its own staff and operating organization.

Review of Defense: By Congress?

Air Force and Navy both want Congress—instead of a commission appointed by the President—to undertake a review of the whole defense program.

This probably would save time:

- Any major changes in the defense program recommended by a presidential commission, such as reorganization of the department or revision of roles and missions of the services, will have to be passed on by Congress and translated into law before they can become effective.
- The outcome of any other proposals—for example, more or less emphasis on carrier or land-based aviation—will also depend on Congress. It would be up to Congress either to implement them with funds or veto them by refusing to allow funds.

It may be that Congress will set up a joint defense review committee of its own, even if the new President appoints a commission. This is what developed in the review of the air power program in 1947. Despite the appointment of an Air Policy Commission by President Truman, Congress organized a Joint Congressional Aviation Policy Board to cover the same ground.

Another Stretchout?

Another stretchout of the aircraft production program in a few months now seems likely.

Under present schedules, spending for aircraft and related procurement—ordered two years ago—will mount to around \$12 billion for the 1954 fiscal year (which starts July 1) and total defense spending for the year to over \$50 billion. For the current 1953 fiscal, spending for aircraft procurement is estimated at \$9.3 billion and total defense spending at \$47 billion.

The Truman Administration, it is understood, wants to keep military expenditures for the coming year to about this year's level. The new Administration and Republican Congress may even insist on a lower level.

The only way to hold down expenditures is to slow down delivery rates and stretch out the air power program.

Navy: A Political Advantage?

Scaplanes, able to deliver atomic attack and land anywhere on the world's protected waters, will probably be as easy to sell to Congress as the B-36 intercontinental bomber was a few years back.

They have the same points of political appeal:

- Both hold forth the possibility of carrying a war to the enemy, delivering blows that would minimize dragged-out ground fighting.
- Neither requires foreign bases involving entanglements and the prospect of enemy capture. —Katherine Johnsen

AVIATION WEEK

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Supersonic Plane to Use Hydro-Ski Gear

- Convair XF2Y-1 slated for new landing device.
- Two versions of system have been developed.

A revolutionary new landing gear that will enable high-speed fighter aircraft to operate from water, grass, ice and snow has been developed as a result of a joint military-civil research program.

The new type gear is known as a hydro-ski. It is a development of the common water-ski with a bottom planing surface and a cambered upper surface to provide underwater lift.

First test of the hydro-ski will be made soon in San Diego Bay with the flight of the radical Convair XF2Y-1, a delta-wing supersonic water-based fighter.

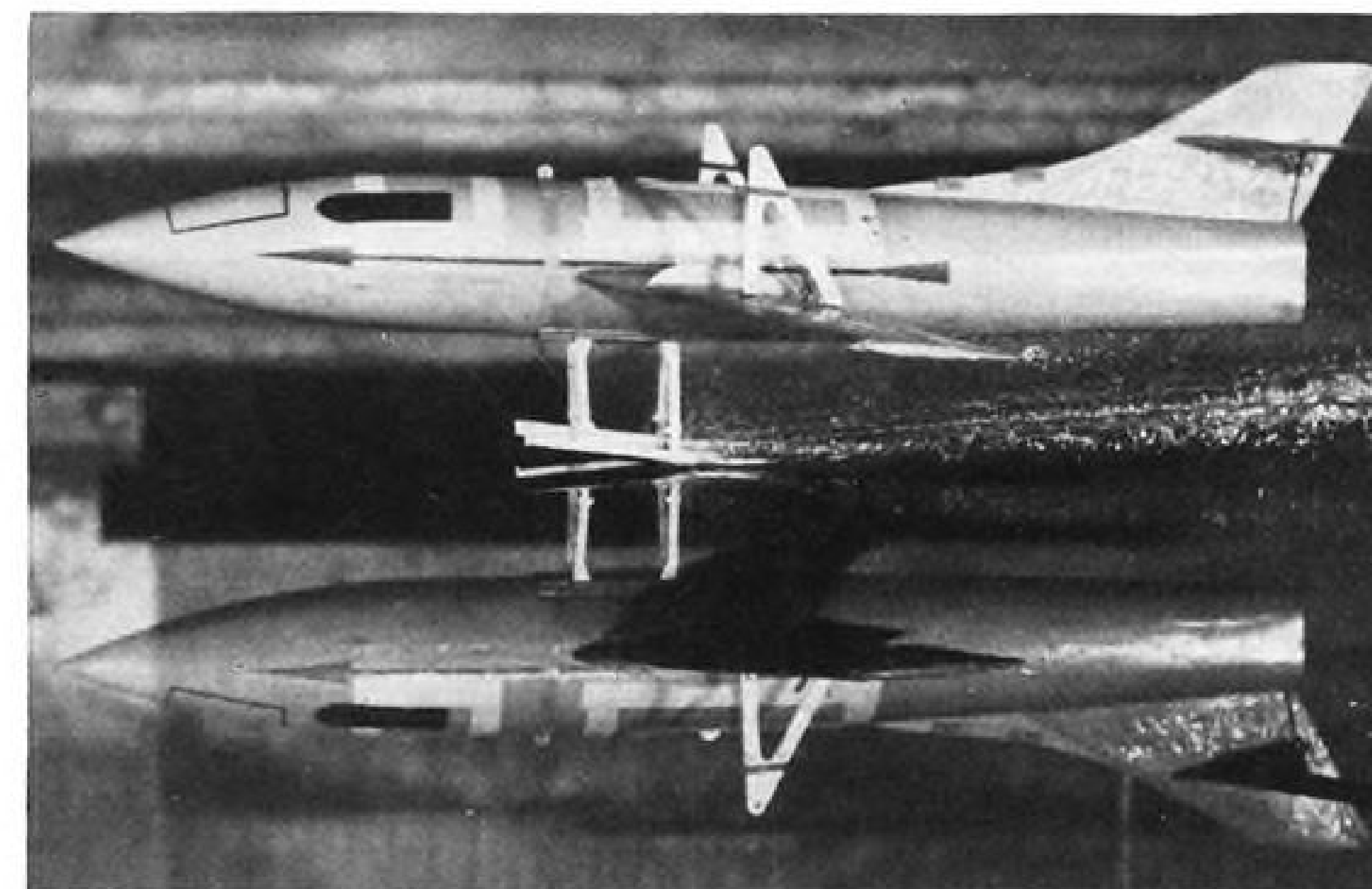
The XF2Y-1 is the first combat-type aircraft to be fitted with hydro-skis. It will operate with a pair of retractable aluminum hydro-skis that will enable it to take off and land in extremely rough water without a seaplane hull.

The XF2Y-1 will be powered initially with a pair of Westinghouse J34 turbo-jets but production versions are scheduled to take more powerful Westinghouse J46 jets. Indication of Navy's interest in this program was the revelation during fiscal 1953 budget hearings that it planned to invest nearly \$6 million apiece for a service test quantity of the Convair water-based fighter.

► **Pioneers in Arctic**—The Convair XF2Y-1 is expected to pioneer a new field in sonic fighter development, particularly for the Arctic areas where development of long, solid runways for jet operations is extremely difficult. The Convair fighter could operate from protected waters in the summer and off ice and leveled snow strips during the winter.

Six years of development by the NACA, Navy, Air Force, the Research division of All-American Airways and the Edo Corp. lie behind the current applications of the hydro-ski. Basically, the idea was used in the early thirties by Canadian bush pilots who used their winter ski landing gear on water during the transition periods when ice was melting.

In 1946 NACA initiated investigations into the possibilities of developing hydro-ski designs applicable to high



DOUGLAS SKYROCKET model tested hydro-ski devices in NACA water tank.



GRUMMAN JRF GOOSE was used by Edo Corp. for "live" tests of new gear.

speed seaplanes of the future. Early NACA investigations were centered around model testing of the Douglas Skyrocket (D-558-II). A year later the Air Force instituted a research program with the Edo Corp. to develop a ski gear capable of operation on snow or water for its rescue planes and in 1949 All-American Airways sold the Navy on the idea of experimenting with water-skis for landplanes.

► **Two Development Lines**—Development has proceeded along two basic lines:

- The application of hydro-skis to aircraft that are inherently buoyant.
- To aircraft that have no inherent floatability.

The first type is represented by the Edo installation on the Grumman

JRF. This plane has a normal seaplane hull and uses the planing characteristic of the hydro-ski for landing and take-off at relatively high speeds. As the aircraft slows down it sinks to rest on its hull. As it speeds up for takeoff the hydro-ski lifts the hull out of the water and the final takeoff run is made entirely on the hydro-skis.

The Convair F2Y-1 is a variant of this theory. It has a watertight fuselage and can float on the water. But the hydro-skis take all the shock of the water impact on both landing and take-off. Therefore the F2Y-1 could be designed solely as a high-speed fighter without any sacrifice in performance required by a high-strength seaplane hull.

► **Get Water Lift**—On takeoff the

hydro-skis are extended and the XF2Y-1 begins its run with the skis under water.

The plane's cambered upper surface provides aerodynamic lift in the water (800 times denser than air) and lifts the fuselage out of the water until the V-shaped lower planing surfaces of the ski take over.

The fighter makes its final takeoff run on the skis. On landing, the skis take the impact and, as the fighter loses speed, it sinks into the water and floats on its fuselage.

Flight tests by Edo with the non-retractable hydro-ski installation on the JRF proved its utility over a wide variety of operational conditions. During the winter of 1948-49 the JRF was successfully operated from Grenier AFB in New Hampshire from water, snow, ice, and slippery sod. In March 1949 the aircraft moved to the snow-covered airport at Farmingdale, Long Island, and operated until the snow melted and then continued successful operations as long as the sod and immediate top soil remained moisture laden for lubrication.

Edo research on the JRF pointed to the following conclusions:

- Landings can be made in waves three times as high as are normally considered safe for the aircraft type.
- Takeoff time was cut in half compared with normal hull runs.
- In rough water the small V-shaped bottom of the hydro-ski takes the high-speed impact of the waves rather than the whole structure of the hull bottom or conventional floats.
- Load on the hydro-ski can be insulated from the aircraft structure by means of a shock strut in exactly the same manner that wheels are attached to landplanes.

The second approach has been explored by the Research division of All-American Airways now known as All-American Engineering Co. First installation was made on a Piper Cub, and later a Navy SNJ was tested. By maintaining a high taxi speed the aircraft can be maintained above the water until a beach or ramp can be reached.

Small integral wheels can be incorporated in this type of hydro-ski to facilitate taxiing up a beach or ramp or for grass strip takeoff. The possibilities of this type hydro-ski application still remain to be explored. They are being considered for triphibious type assault transport aircraft that could take off from either land or water, land from a beachhead and taxi onto the beach to disgorge their load. Another future application looms in the lightplane field where the hydro-ski can combine the advantages of both the pontoon and wheel gear in a single structure.

Security?

On page 24 of the recent public report of Defense Secretary Robert Lovett to the Senate Armed Forces Subcommittee investigating the defense production program, Lovett and the Munitions Board decline to furnish Congress with monthly reports on the military aircraft production picture because of regulations.

Lovett writes: "Aircraft production schedules for types of plane are espionage targets of the highest priority."

Ten pages earlier in the same report, Lovett makes public USAF figures on production rates of the Air Force's three most important types—the B-47, F-86 and F-84—and the production record of the two engine builders furnishing jets for these three key planes.

United to Cut Coach Seating for 'Safety'

United Air Lines President W. A. Patterson last week swung a verbal haymaker at the aircoach business which he had long previously opposed by an announcement in which he called aircoach (high-density) seating a "safety hazard."

United has decided, he said, to reduce its DC-4 aircoach seating capacity from 66 to 54. And a United spokesman told AVIATION WEEK later he expected United's high-density seating plans for DC-6s and DC-6Bs would also be changed to provide less seats.

The Patterson announcement, without inter-airline consultation, hit other scheduled and nonscheduled airline operators hard. One top officer of a leading international airline estimated that widespread acceptance of Patterson's views on coach safety would jeopardize considerably more than \$100 million worth of aircoach investment and billions in future sales programs.

TWA had recently announced it would have a \$25-million investment in high-density coach next summer.

Pan American is receiving more millions worth of 82-passenger coach DC-6Bs. American Airlines had just announced it would increase its DC-6 coach seating from 70 passengers to 80. All three—American, TWA and Pan American had this autumn stated that high-density coach would soon out-volume the luxury standard long preferred by United.

And Eastern Air Lines has operated high-density Constellations and DC-4s for several years with the same five-

abreast seating now condemned by United President Patterson.

All the major airlines except United had recently predicted high-density coach seating would become the standard means of air travel.

United Air Lines this summer did not recommend any changes in CAB's proposed safety regulation permitting 86 occupants in a DC-4.

Patterson's sudden switch followed by only a few days results of a study he had contracted for with Cornell Aeronautical Laboratories, a company spokesman told AVIATION WEEK. Results of this study convinced him the safety risk of passengers being trapped in a fire after a crash was increased by high-density seating.

CAA and CAB studies completed this summer found the same fact. But Civil Aeronautics Board ruled that retroactive cuts in airlines payload from the seating densities previously approved by CAA would work undue hardship on the airlines. The economy of aircoach seating made the calculated risk of exit "congestion" after a crash worth taking, CAB decided.

CAB has approved total occupancy of transports as follows: Stratocruiser 96, C-46 67, DC-4 86, DC-6 87, DC-6B 112, Constellation 87 and Super Constellation 96.

Centerline Lights Get Big ICAO Vote

International standardization on the single-row centerline type of airport approach lighting appeared assured last week with agreement of technical representatives at the International Civil Aviation Organization at Montreal, who voted without an opposing voice, to accept this type of lighting. One country, France, abstained from voting.

Commitment of U. S. technical representatives on the single-row centerline system presumably meant a withdrawal of Air Force and Navy opposition, which had previously delayed U. S. endorsement.

While a formal vote of the member countries is still necessary before official ICAO acceptance of the standard, it is predicted that this will follow the course already taken by the technical representatives.

Acceptance of the single row centerline standard with condenser discharge lights represents a triumph for the U. S. and International Air Line Pilots Assns., which have been advocating this system, and sponsored such a system at Newark Airport.

The new standard will mean modification of many current U. S. airport systems by moving over left-hand row approach lights and changing sloped approach lights to centerline lights.



William Stieglitz



John Lindberg



Capt. P. P. Cocquyt



Brig. Gen. O'Keefe

Flight Safety Award Winners

Four awards for "achievement in safer utilization in aircraft" were presented at Bermuda last week at the Flight Safety Foundation Air Safety Seminar. They went to:

• **Republic Aviation Corp.**, for early establishment of a Design Safety Department, headed by William Stieglitz. Award was received jointly by Alexander Kartveli, vice president-engineering, and by Stieglitz.

• **Capt. P. P. Cocquyt**, chief pilot, Sabena Air Lines (Belgium), for his psychological studies resulting in a sensory illusion theory and mathematical formula for explaining several air accidents, and which is expected to help avoid similar future accidents.

• **John Lindberg**, Sperry Gyroscope Co. and Pan American Airways, for development of the electronic engine analyzer, to give the air crew a better means of checking powerplant functioning in flight. Lindberg received the award.

• **Directorate of Flight Safety Research**, USAF, for establishing the sig-

nificance of safety as an integral part of operating efficiency. The award was accepted by Brig. Gen. Richard J. O'Keefe, director.

The awards are four symbolic plaques designed by Jerome Lederer, Flight Safety Foundation director, and presented on behalf of AVIATION WEEK, which sponsors them. The main symbol of the plaque is a modern delta-wing airplane, forming a triangle, with the words Flight Safety Foundation around it. A 24-hr. clock dial is mounted on the profile of a globe in the center of the wing, indicating distance is now subordinate to time. Three letter Ms, representing man, machine and medium (the air), are at each corner of the triangle, and their legs, in the form of screw-jacks, press against the globe. This signifies that the airplane is continually squeezing the world into smaller size through use of man, machine and medium, with safety. An eye in each corner of the triangle, indicates need for constant safety vigilance.

Aviation Safety

FSF Safety Clinic Covers Wide Range

By Alexander McSurely

Hamilton, Bermuda—Flight safety problems and interests—ranging from specific new gadgets designed to make airplanes safer, to overall considerations of designing for greater flight safety—drew more than 100 industry and government specialists on aviation from five countries here last week for the fourth annual Flight Safety Foundation Seminar conducted by Jerome Lederer, executive FSF director.

Many sessions were on an off-the-record basis, for freer discussion of opposing points of view interjected by pilots, medical specialists, engineers, and management representatives, but here are some of the highlights:

► **New Devices**—A new inflatable ramp for emergency exit from the main door of an airliner is being developed by Air Cruisers Co., and is being studied by at least two airlines, United and American. Details of the ramp are not disclosed but it is inflated on a split-second basis by the same carbon-dioxide gas arrangement which has proved effective with life rafts.

A new type of non-skid tire tread, which uses a circular tread with metal reinforcement, is being studied by Cornell University's Aeronautical Laboratory.

USAF showed movies of an emergency method under which an F-86 Sabre was safely landed at Edwards AFB in an actual emergency when the nosewheel went out of line and was cocked to approximately 90 deg. Technique was to wet down the runway with Foamite extinguisher so that the nosewheel skidded smoothly along in a straight track until the plane stopped.

U. S. Coast Guard demonstrated a simulated air-sea ditching procedure for the seminar group with the aid of a low-flying Martin PBM which dropped an inflated life raft from low altitude to represent a ditched aircraft. The seminar group watched from the Coast Guard weather station vessel McCulloch, while a motor launch crew put out from the ship and floated an inflated raft downwind to the ditching.

In other demonstrations, the Air Rescue Service dropped a motor lifeboat by parachute from an SB-29 to men in a life raft.

Other subjects on the agenda: flight recorders, pilot aging and economic factors involved, training of designers on safety problems, angle of attack indicators, anti-collision lights, rearward-facing seats, engine analyzers, noise factors and others.

AF Plans \$15-Million F-89 Fix

Heavier wing-attach fittings are ordered to combat "aeroelastic problem"; Gilpatric issues statement.

A \$15-million modification program will be required to eliminate the cause of recent wing failures in the Northrop Scorpion (F-89) night fighter, according to the Air Force.

The modification program will require all Scorpions now in USAF service to be sent back to the Northrop plant at Hawthorne, Calif., for rework in addition to correcting Scorpions now on the production line.

► **Change Involved**—Principal item in the modification program is the substitution of a heavier machined fitting for attachment of the wing to the fuselage for the extruded fittings now used.

It was fatigue failure of these extruded fittings that is now credited with causing the series of Scorpion crashes that resulted in USAF grounding of all F-89s last September.

Meanwhile, John K. Northrop, president of Northrop Aircraft, Inc., announced his retirement from the aviation industry at the company's annual meeting last week in Los Angeles. Oliver P. Echols, board chairman, was elected to fill the additional post of president. There was no indication that Northrop's retirement had any connection with the F-89 problem. Northrop cited ill health as his reason.

► **Added Details**—In addition to the \$15-million modification these other points emerged last week as USAF sought to "clarify" its position on the Scorpion program:

- The production program for the F-89 series has been definitely cut back. Original F-89 production program ran

until the end of 1958. USAF says the program will now terminate in 1955. • A cutback has been made in current production of the F-89D and a shift will be made soon to the F-89G. In addition to the structural modifications, the F-89G will carry air-to-air guided missiles instead of the rockets now mounted in wingtip pods.

- All Scorpions delivered to USAF are still grounded although USAF Undersecretary Roswell Gilpatric said they would be flown "in an emergency."

- There has been a hot and heavy debate in top USAF circles during the past few weeks over whether the Scorpion program should be completely eliminated. A meeting of the Air Council early in November, attended by Maj. Gens. William D. Eckert, Assistant Deputy Chief of Staff for Materiel and Clarence "Bill" Irvine, Deputy Commander for Production of Air Materiel Command, urged cancellation of the program. Maj. Gen. Mark Bradley, Director of Procurement and Production at AMC and Brig. Gen. Al Boyd, Commander of Wright Air Development Center, made an on-the-spot survey of the situation at Northrop and appeared before a later Air Council meeting. Conferees decided to spend the \$15 million for F-89 modifications and continue the program until 1956.

- Industry observers are skeptical of Gilpatric's statement crediting the Scorpion with transonic speed—generally interpreted to mean between Mach .9 and 1.2 and claiming that aeroelastic effects at transonic speeds were outside

engineering experience at the time of the Scorpion's design.

Following is the text of Gilpatric's statement on the F-89 situation made at Northrop's plant Nov. 19:

"A published report in an aviation trade paper [American Aviation Daily] that the Air Force has decided to cancel its F-89 contracts with Northrop Aircraft, Inc., of Los Angeles is untrue. Several wing failures of the F-89 have occurred recently, although the aircraft has been in use two years.

"Careful investigations by Northrop and the Air Force have determined the cause of the failures and remedial modifications have been agreed upon and are being incorporated in the Northrop production line.

"The modification of aircraft now in service will be done by Northrop at its Ontario and Hawthorne, California, facilities. To the extent necessary for the acquisition of new material and fabrication of new parts, the changes will entail a temporary slowdown in production of new aircraft. The modification program will be completed in less than a year. Meanwhile production will be stepped up to bring the entire F-89 program back on schedule at a somewhat later date."

► **Total Unchanged**—"The total number of F-89s to be built by Northrop is not being reduced. [Ed NOTE—This apparently refers only to the program up to 1955.] Meanwhile F-89s in the Air Force tactical units, although temporarily grounded, remain in a state of combat readiness and in event of an emergency would be flown.

"The F-89 Scorpion, a twin-jet, two-seat all-weather interceptor, operates in the transonic speed range. At the high speeds at which it flies—speeds outside engineering experience at the time the aircraft was designed—aeroelastic effects are now found to have imposed on the aircraft structure and particularly the fittings attaching the wings to the fuselage, greater loads than anticipated. These greater loads combined to produce a unique and random fatigue of the attach fittings although the aircraft in earlier static and structural tests under Air Force supervision had demonstrated a structural integrity in excess of requirements."

► **Change Wing Fittings**—"Essentially, changes now under way consist of replacing the extruded wing-attach fittings with heavier machined fittings; and of installing horizontal fins to the wingtip tanks. The addition of tiptank fins has been found to provide a reliable solution to this particular aeroelastic problem at high speeds.

"Technical difficulties of this order at the present state of the aeronautical art are to be expected as the price of progress in the world race for more effective combat aircraft".

Speed Record

- F-86D tops 700 mph. twice in four test runs.

- New U. S. record to be certified to FAI.

A U. S. jet fighter officially has flown faster than 700 mph. for the first time in two measured speed trials which are expected to be confirmed as an international record.

The record, made Nov. 19, will be certified to the Federation Aeronautique Internationale as 699.9 mph.—the average of four high-speed runs over a measured 3-km. course. The flights were made by a North American F-86D, Sabre radar-nosed interceptor, piloted by Capt. J. Slade Nash of Edwards AFB.

► **Clockings**—Highest of the dashes was clocked at 702.651 mph., the second highest at 700.49, the third at 698.442, and the lowest at 698.085.

Charles Logsdon, National Aeronautic Assn. and FAI official timer, said that the very small amount of spread between the highest and lowest speed was due partly to the lack of wind over the course, at Salton Sea, Calif., and partly to the precise flying of Captain Nash.

The airplane was actually flown "underground" since Nash piloted it close to the surface of the dry lake, which has an altitude of 240 ft. below sea level. Logsdon estimated the interceptor's average height was about 125 ft. although it was allowed to operate up to an altitude 100 meters above the ground.

The airplane is powered by a General Electric J47-17 engine, rated at approximately 6,000 lb. thrust, but fitted with an afterburner, which presumably boosted the thrust to approximately 8,000 lb. for the trials.

► **Temperature**—Flights were made at a temperature of 76 deg. F. a relatively cool day for the Salton Sea area, and it is believed the record would have been considerably higher had it been a warmer day.

How long the new record will be allowed to stand without challenge was a question going around aviation circles last week. Predictions were that it will certainly not last as long as the previous record of 670.58 mph. set by Maj. Richard L. Johnson, USAF, in an early North American F-86A at Edwards AFB, Sept. 15, 1948.

Two prospects for early challenges were under consideration:

- Canadian sources indicated that Canadair, Ltd. was anxious to try out one of its Sabres, powered with an Avro Orenda engine, rated at approximately 7,200 lb. thrust, without afterburner.



F-86D FLASHES PAST on record try.

This additional power would be an important factor.

- Washington sources indicated that Jacqueline Cochran, U. S. woman speed flyer, who reportedly has already asked to fly a U. S. Sabre, and received a polite refusal from Gen. Hoyt S. Vandenberg, USAF Chief of Staff, is negotiating now to fly the Canadian plane.

Another possibility is that there might be another attempt to boost the record with an F-86D, flying on a hotter day at Salton Sea.

Beech Exports Top \$18 Million

Beech Aircraft Corp. in its fiscal year ending Sept. 30 sold an impressive \$18,318,357 worth of planes to foreign countries despite dollar shortages and resurgence of competitive firms abroad. This all-time company high more than quadrupled its 1951 export total.

Dollarwise, the company's foreign sales came to 40.1% of all lightplane plane sales abroad. And it expresses considerable optimism on the future of this business. New distributorships have been set up in Peru and Pakistan and dealers in Italy, West Germany and West Austria are already developing markets there. Beech export division manager Michael Neuburger has made a personal flying trip through South America discussing and appraising needs of military forces and business firms.

The company is expanding its Wichita, Kan., facilities as well as its sales. Beech expects that Twin-Bonanza production will open up new marketing possibilities abroad and also plans to push its Mentor military trainer.

New O'Konski Blast At Kaiser Contract

A demand that Air Force Secretary Thomas Finletter immediately cancel all military aircraft production contracts that have been awarded to the Kaiser-Frazer Corp. has been made by Rep. Alvin E. O'Konski.

The latest of O'Konski's blasts against Kaiser-Frazer's aircraft contracts was made in a telegram to Secretary Finletter after the Air Force had revealed the prices being paid to Kaiser-Frazer and Fairchild for production of the same aircraft—the C-119 military transport (AVIATION WEEK Nov. 24, p. 20).

According to the figures furnished Senator Styles Bridges by USAF, Kaiser-Frazer is being paid \$1 million for each C-119 built while Fairchild gets \$260,000 each for building exactly the same plane.

"I charged in a speech before Congress last May that the Kaiser-Frazer price for this plane was exorbitant," O'Konski said. "But my statement was hotly denied by Henry Kaiser. It now appears that the price is even more exorbitant than I had been told at that time."

"What makes the whole thing worse is that the Air Force spokesman who released these fantastic figures did not even propose any immediate action to cut out the waste, rather he attempted to justify this fantastic discrepancy in price. The contract and any others like it must be canceled immediately and any work to be done under it should be awarded to a competent, low-cost producer such as Fairchild."

USAF explains the price differential on the grounds that the Kaiser-Frazer price includes production tooling and a relatively low production rate while Fairchild's price is after tooling has been written off and a substantial production rate achieved.

Travel Agent Rates

International Air Transport Assn. traffic conferees meeting at Cannes, France, have settled on a compromise sales commission rate for travel agents. They set a 7% commission on all international ticket sales except intra-Europe.

The agents had fought the existing 6% coach commission, which compared with the long-time 7½% "standard" commission. With coach already dominating trans-Atlantic travel and expected to exceed the old high-fare standard and boost overall volume everywhere (AVIATION WEEK Nov. 10, p. 87), the travel agents appear to have won a victory with the 7% commission.

Intra-Europe ticket commission remains 7½%.



CANADIAN OTTER CERTIFICATED

De Havilland-Canada DHC-3 Otter has achieved the distinction of being the first single-engine plane to be certificated for wheels or floats under Category D of International Civil Aviation Organization require-

ments. The Otter is in production at Toronto. Powered by a 600-hp. P&WA R1340, the plane seats 8-14 passengers, has a top speed of 161 mph. and cruising range of 900 mi. Gross weight is 7,000 lb.

Boeing Jet Liner

- Company starts project, keeps design a secret.
- But prospective buyers urged to 'wait and see.'

Boeing Airplane Co. has started cutting metal on a few parts of its jet transport prototype, slated to fly in mid-1954. By scheduling production before any competitor, yet keeping its design and performance a secret from customers, Boeing is trying a hidden-ball play on Douglas and Lockheed.

Boeing is running with the ball, but you can't see it. Meanwhile, customers are looking over Douglas and Lockheed brochures, but are not tackling contracts.

Boeing urges the customer to wait and see. When the product is revealed, with earliest delivery dates promised, the inducement to sign on the dotted line may be strong.

► **Active Campaign**—The management is reported confident this tactic will work, on the theory customers want to see the results of Boeing's B-47 and B-52 experience before talking business with Douglas and Lockheed, who have built no giant jets of their own design.

At the last possible moment, but perhaps as early as this winter, Boeing will start an active sales campaign—to sell its jet transport design—first with the Air Force as a convertible tanker and transport and then with the airlines. Completion of full-scale mockups of vital sections may start the sales program. But Boeing has not yet reached that stage.

The company only recently released spare plant facilities for the early stage of parts fabrication. The mockups will be necessary before assembly, a Boeing

engineer told AVIATION WEEK, because this is the only way to lay out component and equipment location to gain the most efficient maintenance and operation.

► **The Boeing Design**—Boeing's designers and top management have not allowed their jet transport design to be circulated within the plant. However, a few generalized hints about Boeing design philosophy on this project are available.

The engine for the prototype, at least, is almost certainly the Pratt & Whitney J57, a reliable source indicates. This is the first U. S. "split-compressor" engine already in service test.

The wing is expected to be similar in many respects to that of the B-52. The transverse taper (thickness) is not constant. The inboard panel tapers rapidly from an extremely thick root. The thin outboard panel has a more gradual taper to the tip. Boeing designers reportedly have discarded fancy wing designs like the "crescent" (AVIATION WEEK Nov. 17, p. 22) as being too complex and heavy.

A Boeing official says the B-52 wing showed up better in actual tunnel tests than did fancier shapes with more theoretical advantages.

► **Fuselage Ideas**—As to the engine mounting, a Boeing jet transport design study two years ago stated that pod mounts slung forward at the wing are an important means of reducing shock from turbulent air. The B-52 bomber design gives evidence of that philosophy, and passenger transport comfort requires a smoother ride than a bomb load.

Less is known about Boeing's jet transport fuselage ideas, because little can be borrowed from the bombers. Also, the recent belated airline emphasis on high-density seating capacity may have started some radically new thinking on jet transport fuselage design.

Cuban Group Buys PAA Havana Airport

A syndicate of Cuban businessmen has acquired Rancho Boyeros, the international airport serving Havana, formerly belonging to Pan American World Airways which had spent more than \$2 million developing the field.

The airport was one of the numerous facilities developed and operated by the carrier when it went into Latin America in the 1920s; then few of these countries had airports or were willing to build.

In the past several years PAA has been "getting out of the airport business" and has sold many of the installations it had set up. Boyeros' development started in 1928 and is now used by 15 international and domestic carriers.

It is located 15 minutes from downtown Havana.

The former owner recently completed plans for expansion of the field, which have been turned over to the new owners. These plans called for extension of the main runway from 4,800 ft. to 10,000 ft., construction of a parallel 10,000-ft. runway and a new terminal building.

NYA to Extend Mail Services

New York Airways, certificated mail, parcel post and passenger copter service, plans to inaugurate air mail service Dec. 8 on the north segment of its approved AM-111 route which covers Mt. Vernon, New Rochelle, Scarsdale, White Plains, N. Y.; Greenwich, Stamford, South Norwalk and Bridgeport, Conn., and Pleasantville, Tarrytown and Yonkers to La Guardia Airport, N. Y.

Due to lack of heliport facilities at Scarsdale, this city will not share in the opening. Other towns have made landing facilities available on small lots, parks and similar cleared areas near main post offices.

NYA expects to have its third Sikorsky S-55 delivered in time to participate in the new operational phase. The carrier began a mail copter shuttle service between La Guardia, Idlewild and Newark Airports Oct. 15.

England Gets ICAO Meet

International Civil Aviation Organization will hold its seventh large-scale Assembly in Brighton, England, beginning June 16, 1953. The sessions will last approximately a month.

Originally France and England had submitted invitations to ICAO; the French withdrew when it learned that Britain was particularly anxious to be host to the Assembly.



VARIG PUTS JETS ON ITS C-46S

A Curtiss C-46 belonging to Empresa Viaçao Aerea Rio Grandense (Varig) fitted with two small auxiliary turbojet engines (within circles under wings). The carrier reportedly

has purchased enough of the units to outfit all its planes. Varig, with headquarters in Porto Alegre, flies domestic routes within Brazil and to Montevideo and Buenos Aires.

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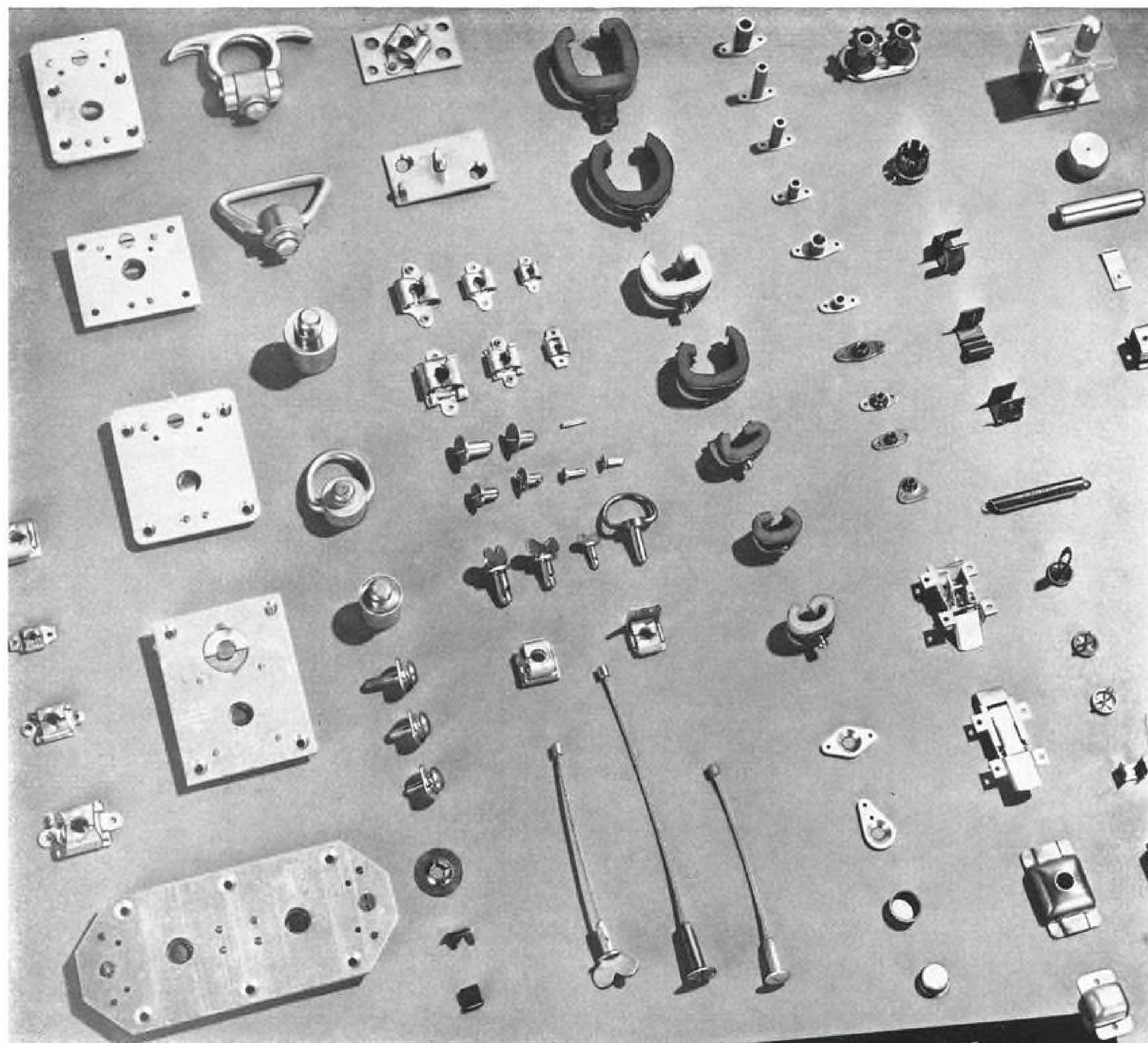


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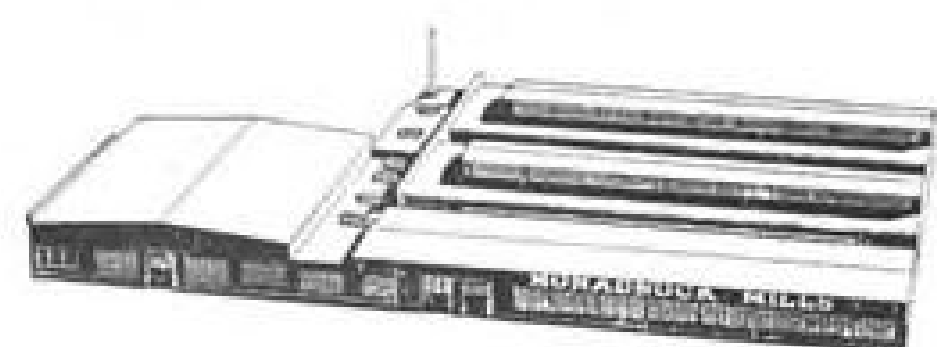
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AERONAUTICAL ENGINEERING

Are You Using Your Technical Manpower Effectively?

Ask Your Engineers These Questions:

- What jobs are you now doing which could be turned over to technical specialists?
- Could any of your duties be simplified so that they could be turned over to subordinates?
- Could any of your administrative detail work be turned over to non-engineers or competent secretaries?
- How can our training program for recent college graduates be improved to make them better equipped to assist you?
- What changes or improvements in organization or planning would lessen the workload of the engineering staff?
- Do your working conditions enable you to work at peak efficiency?
- Can you name any people who would make good tech-

nical assistants or who would be interested in training for such work?

- Have you any recommendations for the indoctrination program?
- How can shop personnel be made more effective in their assistance to you?
- Are your communications with management satisfactory?
- Could any of your routine work be performed better by mechanical aids?
- How can we relieve the engineering staff of detail work?
- Do you have any suggestions on cooperation with local schools and colleges?
- Could any engineering operations be changed to reduce waste time and motion?

A Plan for Stretching Engineer Supply

Professional group's study indicates how industry can improve its inefficient use of trained people.

The continuing shortage of trained technicians is particularly acute in the aircraft industry. Each company needs more engineers than it has. Each company is using every means to hire those engineers from schools, from other industries, from other companies within the industry.

But each company must inevitably get less than its target quota. There aren't enough engineers to go around. There are not enough graduating to meet industry's needs. And, with the high school population on the wane, this is no relief in sight.

How can you solve this problem?

► **Use What You Have**—One possibility promises some relief from the shortage. If you can use your engineers more efficiently—without imposing the physical burden of more hours or more worries—you can go a long way towards beating the shortage.

How can you go about utilizing engineering manpower to the fullest advantage?

This has been studied by the National Society of Professional Engineers, and out of its studies has come

a clear, and detailed report to industry.*

Second in a series begun in 1951 by the NSPE, the report pools the experience of almost 500 companies employing engineers. These firms employ more than 100,000 engineers, and a total of almost 3 million people. They operate almost 4,000 plants.

They need 11,000 more engineers now, and will need an additional 8,000 before next March.

Their engineers—at least 85% of them—spend more than three-quarters of their time in technical work, but also work in sales, customer relations, industrial relations, executive duties, advertising, patent law.

What they report should be of value to industry everywhere. Here is what they say:

► **Weak Indoctrination**—Most companies report that engineers are put to work immediately after clearing

through personnel routine. A majority of the firms have no indoctrination program whatsoever for recent engineering graduates. Almost two-thirds of the companies have no such program for recently hired, experienced engineers.

Thus, many engineers work in a vacuum, not of their own making, which seals them off from knowledge of company policies and plans, and how engineers fit into the general scheme.

The report says that organized indoctrination programs "... perform the double function of telling the engineer about the company, its policies and his future with it as well as thoroughly orienting him on methods and procedures which he is to use in his work. He is therefore better able to produce at peak efficiency."

Post-graduate training is an integral part of any indoctrination program. This training and selection of key personnel go hand-in-hand. Such programs make it possible to eliminate misfits before the company has invested much money in them; it enables the capable men to reach their own level of productivity in shorter time.

Most often there are two classes of training programs. A short one for experienced personnel briefs them

*"How to Improve the Utilization of Engineering Manpower — Executive Research Survey Number Two." Prepared by the National Society of Professional Engineers, 1121 Fifteenth St. N. W., Washington 5, D. C.

rapidly on working routine and methods. A longer one, generally used in the heavy industries and communications business, takes junior engineers through a two-year course aimed at thorough familiarization with company practice.

► **Organization Details**—Considerable study has been given the problem of staff organization by many of the companies reporting. The tendency is to centralize top-level engineering, at the same time achieving economies in administrative and clerical costs.

Clearly defined delegation of authority and responsibility is rated a must by the report. One company says that

closer supervision brings better results. Some relief of engineering work load is obtained by a jet engine manufacturer who set up an engineering planning group. This department takes over details of estimating, scheduling and budget control, and so gives administrative assistance to project engineers.

Supervisory training is another item on the recommended list. With adequate programs for such training, supervisors are able to get the most out of people assigned to them, and to learn how to organize and plan their work for increased efficiency. A little knowledge of the way people operate

also helps the supervisor to provide the personal touch.

Better planning, says the report, may be a restatement of an obvious requirement. But some returns in the NSPE poll urged that work planning be more carefully studied for comprehensibility. Other replies suggested that engineering work loads should be scheduled in close cooperation with sales and operations departments, and reviewed at frequent intervals.

► **Project Engineer**—Of interest to the aircraft industry is that the report singles out the "project engineer" system for attention. This procedure, long standard in most of the aircraft business, places authority and responsibility in the hands of a single individual. He worries about the entire project from design through production. Generally the project engineer is prospective executive material who will be shifted from one job to another in order to familiarize him with the company procedures.

Other companies reported that moves to new quarters with more space and less noise raised the engineering efficiency. Minor additions, such as more telephone extensions and elimination of traffic through an office, helped to boost engineering productivity.

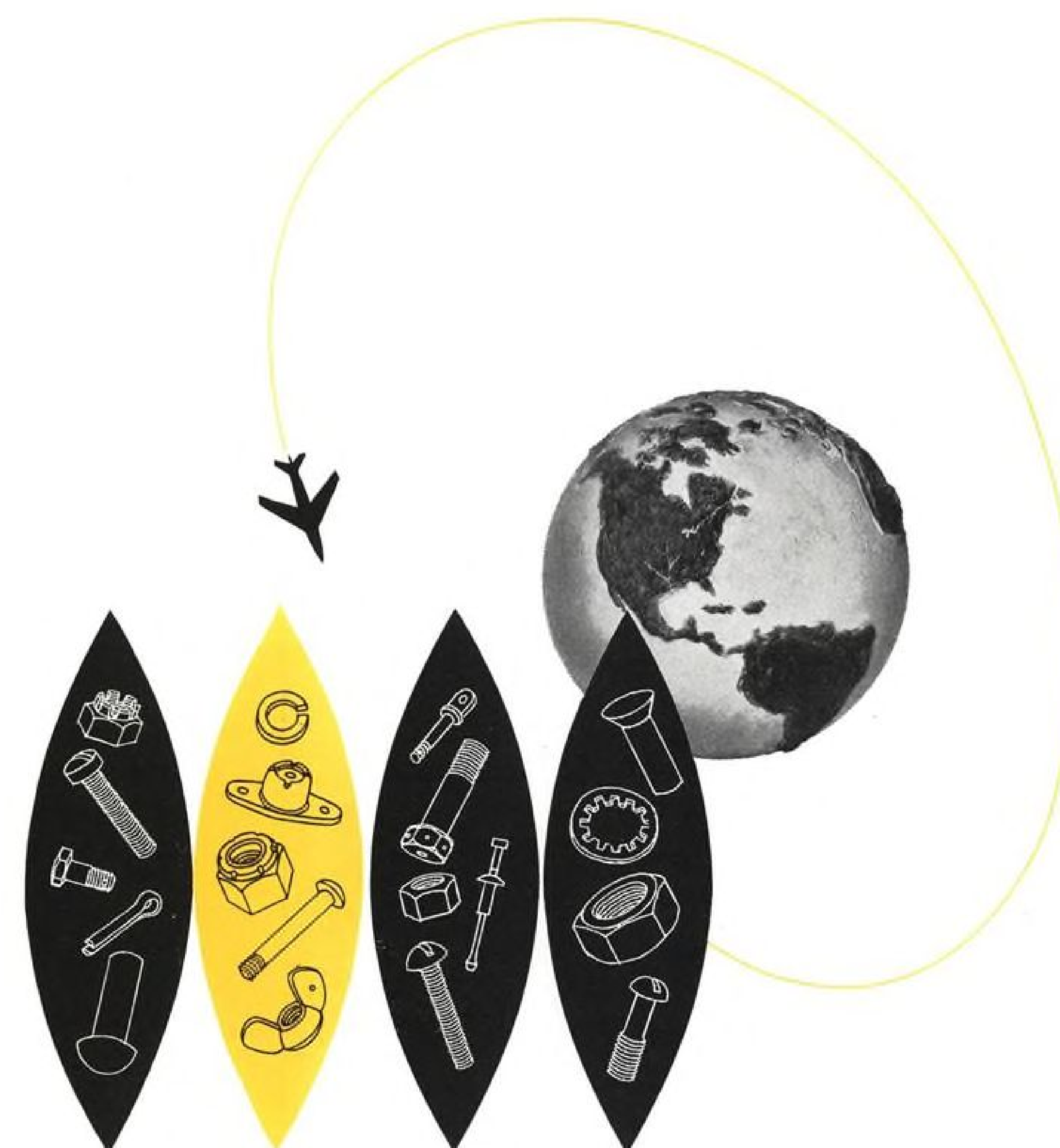
► **Other Suggestions**—These additional suggestions were included to stimulate thinking:

- Let women clerks help with engineering details to the limit of their capabilities.
 - Increase the use of standard practices to eliminate detail work.
 - Solicit and encourage ideas from all personnel levels through the medium of the conference.
 - Let younger engineers participate in conferences affecting basic technical decisions.
 - Use neighboring university facilities for training and consultation.
 - Give paid, time-off periods for attendance at training courses and symposiums.
 - Compromise with perfection when the next best thing will save time and money.
 - Improve working conditions with respect to noise level, environment, equipment, lighting.
 - Use punch cards and similar aids to obtain engineering data easily.
- **Engineering Support**—The use of supporting personnel is underscored by the survey as one of the most productive methods to obtain full use of engineering manpower.

Many of the companies report that many jobs can be standardized or simplified by breakdown so that they could be performed by non-engineering help. They add that engineering management is needed to build these support-



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ing staffs, and that a little training makes most engineers take readily to supervisory work.

Technical aides—recruited from institutes with 18- to 24-month training courses—are being worked into engineering programs by many of the reporting companies. The supply of well-trained aides is about as limited as that of the engineers they are supposed to replace, but this situation is eased somewhat by companies which train their own people.

Sources of supporting personnel are high-school graduates with technical ability, college graduates with arts degrees or majors in science and mathematics or personnel who are employed in the shop.

Educators have suggested that efficient use could be made of engineering students who did not complete their courses of study, and the NSPE adds the suggestion that engineering colleges keep records of those students. They may be fitted in sub-professional engineering work.

The prospective manpower pool offered here is quite large. Estimates place the number of non-graduating engineering students at half of the total initial enrollment. These non-graduates had to have some technical ability to be accepted by the colleges, and received technical training during the incomplete course of study. Use should be made of their knowledge, says the report.

The nature of the work which supporting personnel can handle varies with the industry. It could be any of these: drafting, designing, drawing changes, data collection and collation, computations, layout, expediting, cost accounting, market research, material orders, charts and graphs preparation, work on standards books, handling of shop details, investigating customer complaints, preventive maintenance, operation of experimental equipment and pilot plants, preparation of parts of surveys and studies, and general legwork.

► **Engineers' Jobs**—Accusations of "engineer-hoarder" have been aimed at segments of the industry. But the survey indicates this is not a general practice.

Replies show that 85% of the engineers spend more than three-quarters of their time in technical engineering work. If they are used in some other capacity than this, it is usually an executive one.

More than half of the firms queried employ engineers in executive duties outside the engineering department or in sales. A quarter of them use engineers in customer relations and a fifth use engineers for industrial relations work.

The report says: "Where it is neces-

sary to use an engineer for these functions, the companies are justified in doing so. However, sometimes firms use graduate engineers . . . when the jobs could be filled just as well by others. In such companies, the survey shows that the engineer can often be used on technical problems to much better advantage to himself and to the company."

As part of this general subject in the survey, NSPE asked about registration and licensing of engineers. The reports show that a professional license is desirable, although not a necessity. But engineers have widely accepted registration as advantageous, and both man-

agement and the public are growing aware of the benefits of licensing.

► **Outside Help**—About half of the reporting companies state that they turn to auxiliary sources of engineering talent to relieve the work load in their own departments.

Here's the way the survey lists such sources (the percentage figure is based on the companies which report the use of such outside help):

- Engineering consulting firms, 55%.
- Drafting contract firms, 31%.
- Retired engineers, 20%.
- Non-citizen engineers, 9.8%.
- Research organizations, 26%.
- Student Assistants—One additional

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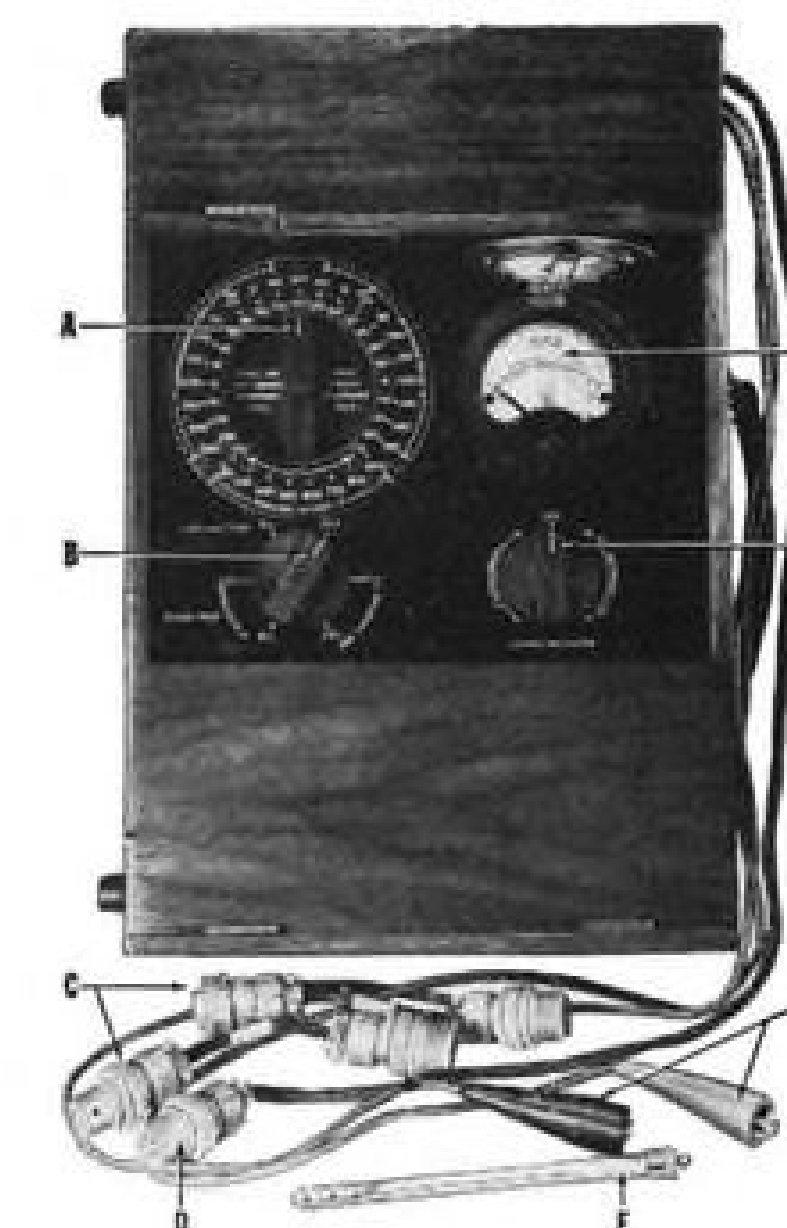
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- G Rheostat. H Standardizing voltmeter

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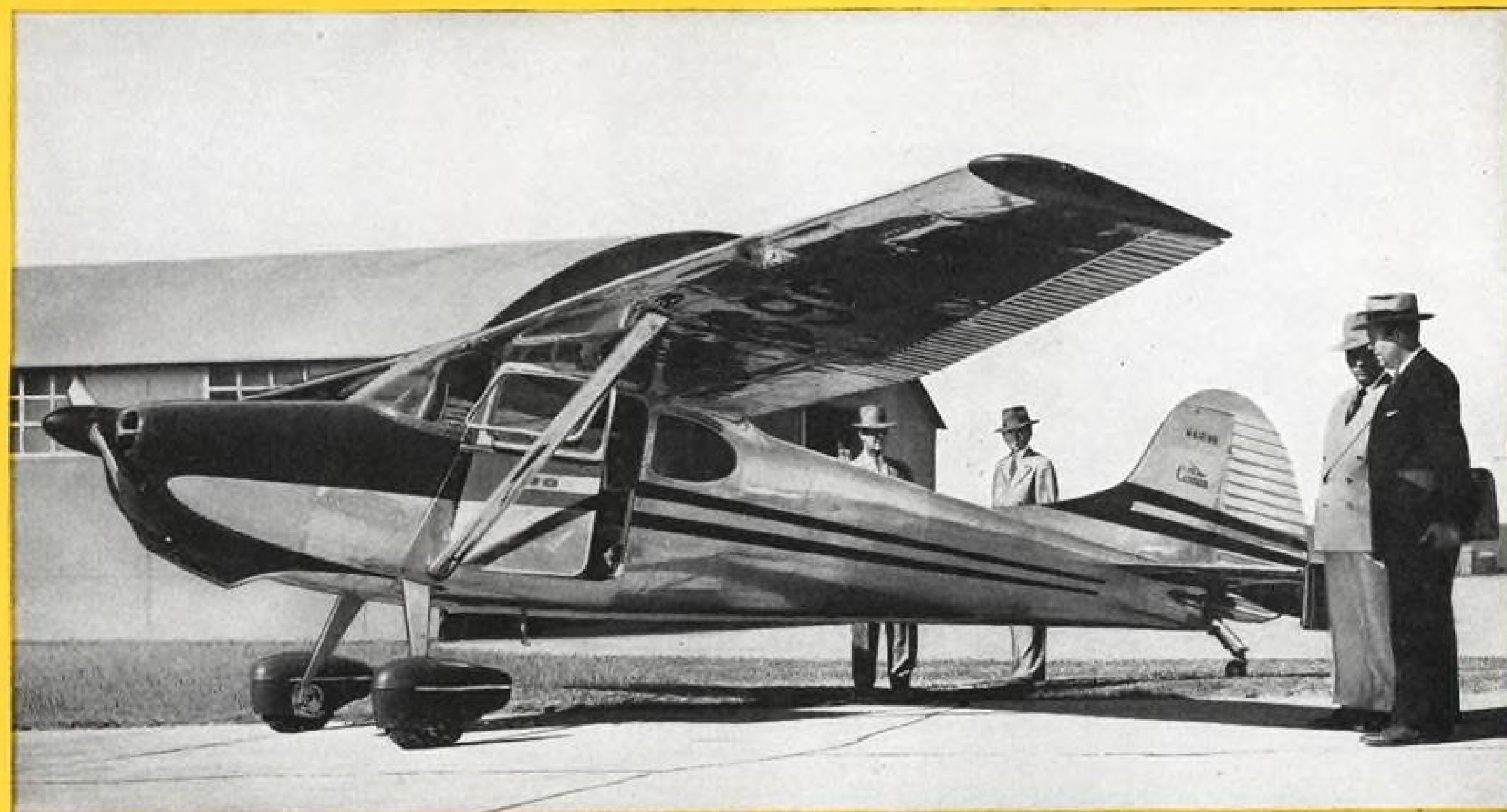
MODEL 81TT9 is provided with the following calibration ranges for Thermocouple Thermometers — 0 to 1000°C chromel-alumel, minus 50 to plus 350°C iron-constantan and minus 50 to plus 350°C copper-constantan. Calibration points for ratiometer are provided for the following in centigrade —70, —50, —30, —10, 0, 10, 30, 50, 80, 100, 120 and 150, for dual or single indicators, in accordance with the AN-B-19 Curve.

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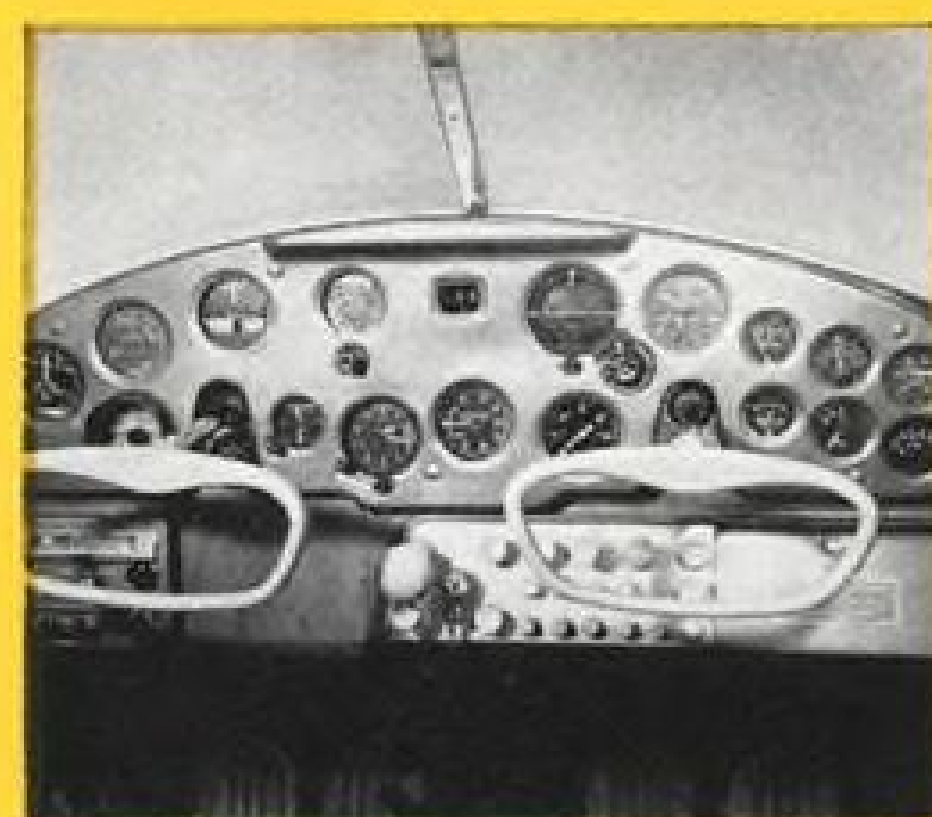
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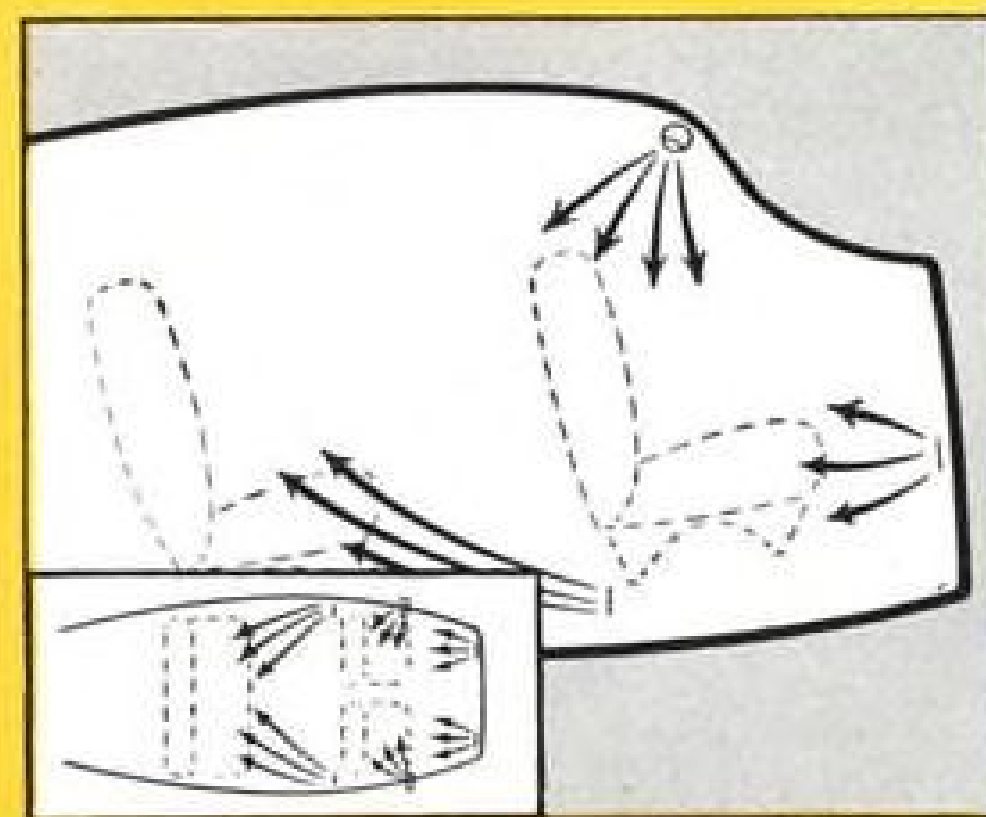
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The "Golden Year" Cessna 170 is new in appearance, new in performance, new in comfort and safety. All of the new features can't possibly be listed here—but if you, like so many other businessmen, feel that there is a place for an airplane in your business, see the new low priced all-metal Cessna 170 at your Cessna Dealer. He is listed in the yellow pages of your phone book. Or write: Cessna Aircraft Company, Dept. 91, Wichita, Kansas.

source not listed here, but covered in the report, is the use of college engineering students as assistant engineers. The NSPE says that such use depends on proximity and relations between the college and the company, but suggests that the idea is worth investigating.

Summer vacation assignments offer a possible use of college students. About two-thirds of the reporting companies employ students during these periods. Interestingly enough, only a small percentage of these men join the company following graduation. The NSPE says that this indicates the need for a company selling job.

Most companies agree they would hire women engineers if they were available. Almost half of the companies polled have found it feasible to use women engineers, and almost one-quarter have them on the staff.

► **Standards Eased**—Certain standards have been relaxed by a number of the companies to enlarge the technical pool; 39%, for example, have reduced the requirements for experience. About one-quarter of the firms have reduced standards for both age and education. Standards for physical condition were relaxed by 19% of the firms queried.

No large use of part-time engineering personnel is reported. In this group, college teachers are used most frequently, followed by retired engineers, non-citizen engineers and high-school teachers in that order.

► **Personnel Turnover**—Maintaining a staff in the face of continual turnover of engineering personnel poses a tough problem for about 42% of the companies. Highest rate of change occurs with aeronautical, electronics, mechanical and electrical engineers.

Benefits—(hospitalization, insurance and pension plans) and incentives—(more pay, profit-sharing and advancement) help to keep turnover at a minimum, according to the report. Most of the companies feel that the incentive features are more important than the benefits. They list the importance of incentives in this order:

- Opportunity for advancement.
- Stability of employment.
- Education through extra training.
- Essential industry.
- Profit-sharing plan.

The report says that the regulations of the Salary Stabilization Board have proved costly in terms of lowered morale and loss of key personnel. Action by the NSPE resulted in some freeing of the engineer from terms of the Board's ruling. As of July 1, 1952, all professional engineers employed in a professional capacity are exempted from salary controls.

► **Military Deferrals**—Now, what about military demands?

Lack of action by companies in re-



GRUMMAN F9F-6 COUGAR which recently completed carrier evaluation tests.

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requesting deferments is reported. Only 38% of the companies requested deferments for young engineers eligible under Selective Service. A higher number 43%, asked that their engineers in the Reserve be deferred.

NSPE is taking an active part in publicizing the importance of the proper use of engineering manpower by the armed services. The report states that engineers serving in a defense industry are serving their country as much as the soldiers or sailors whose lives depend on the weapons which the engineers develop.

► **Scholarships & Grants**—Financial assistance to worthy engineering students is an integral part of the program of many companies. Aid is in the form of full scholarships or specific grants against tuition for certain periods.

In addition, some firms make grants to colleges, donate laboratory equipment and components, and work with the colleges in program planning.

But the report indicates that not enough money is flowing into teaching. A survey of teaching salaries made by NSPE shows that in the 1950-51 academic year, an instructor averaged \$3,151. During 1951-52 this increased slightly to \$3,427. Professors in the latter year earned an average of \$5,980.

► **Teachers Needed**—Says the Survey: "These figures show very clearly that unless some additional pay incentive is given professors and instructors in engineering colleges, there will be little encouragement for engineering graduates to enter the teaching profession. At present, an engineering graduate of the high caliber desired for teaching would be offered an attractive starting salary by private industry. If he entered the teaching profession, he would receive a starting salary of about \$250 a month."

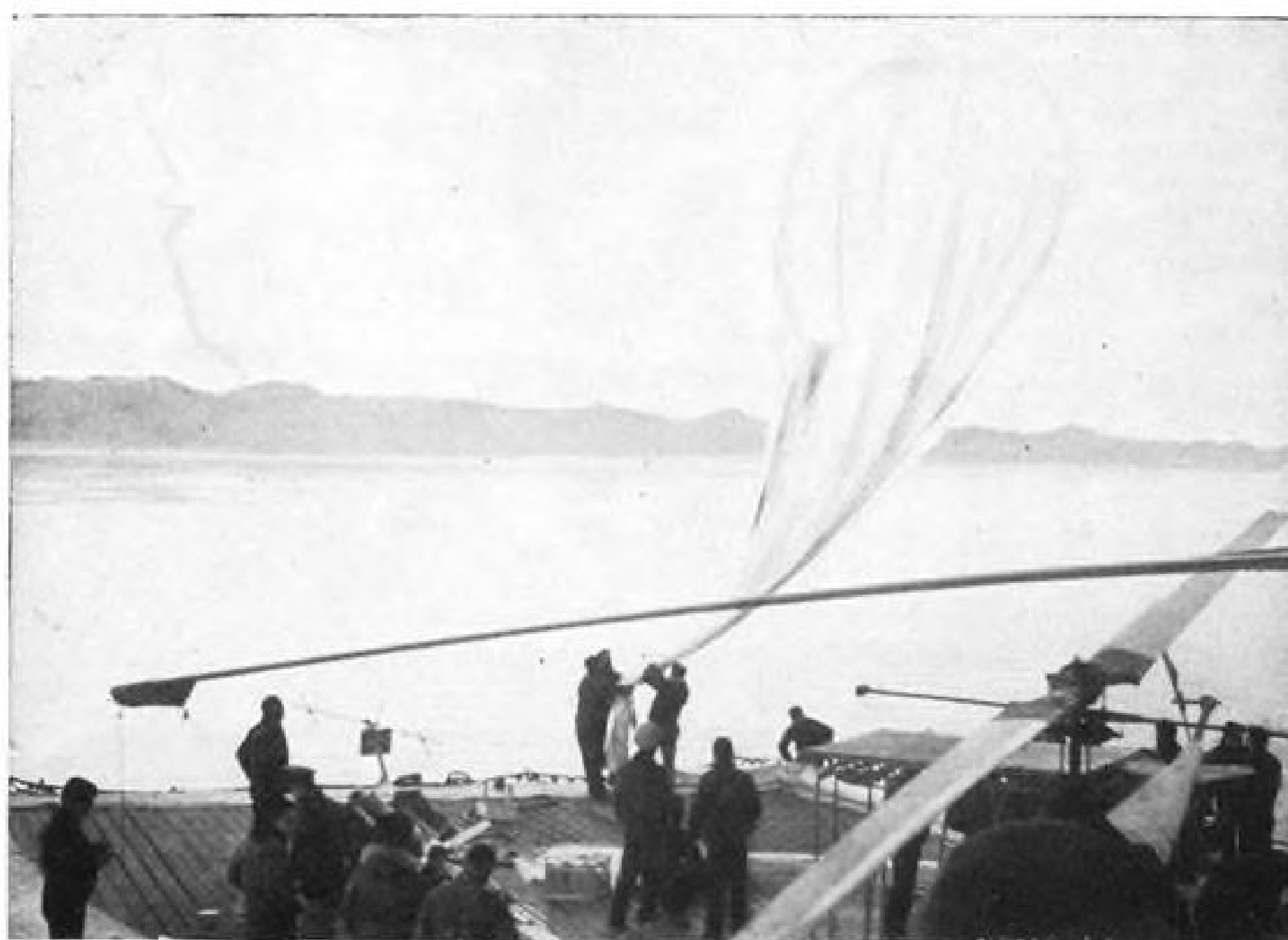
The report recommends a course of procedure: Industry "... must help to attract competent men to the teaching profession by providing supplementary sources of income."

It cites the case of a southern textile mill. This mill hired the local high-school science teacher during the summer months. His salary for that period was the difference between his teaching salary and the pay he could have made in private industry. Thus the company insured his teaching a continuing supply of high school graduates for employment in their mill.

► **Utilization Checklist**—Industry is urged to make a survey of its present staffs to find out how to utilize its manpower more efficiently.

The report suggests a checklist, such as printed on p. 21 for this purpose.

Chief importance of the checklist is in stimulating the engineering staff to think about these methods and to suggest new ones.



SKYHOOK BALLOON is readied for launching near North Pole by ONR scientists. Blades of expedition's two helicopters, used for instrument recovery, are in foreground.

Team Probes Radiation Barrier

Man's ability to penetrate the radiation barrier and survive in space may be determined from data gathered in Navy's balloon-rocket experiments in Greenland this summer.

Instruments and instrumented rockets, carried as high as 90,000 ft. by plastic Skyhook balloons, were used to measure the charge and energy spectrum of the primary cosmic radiation at extreme altitudes.

These radiation phenomena, as yet incompletely understood, may be the determining factor in man's conquest of space.

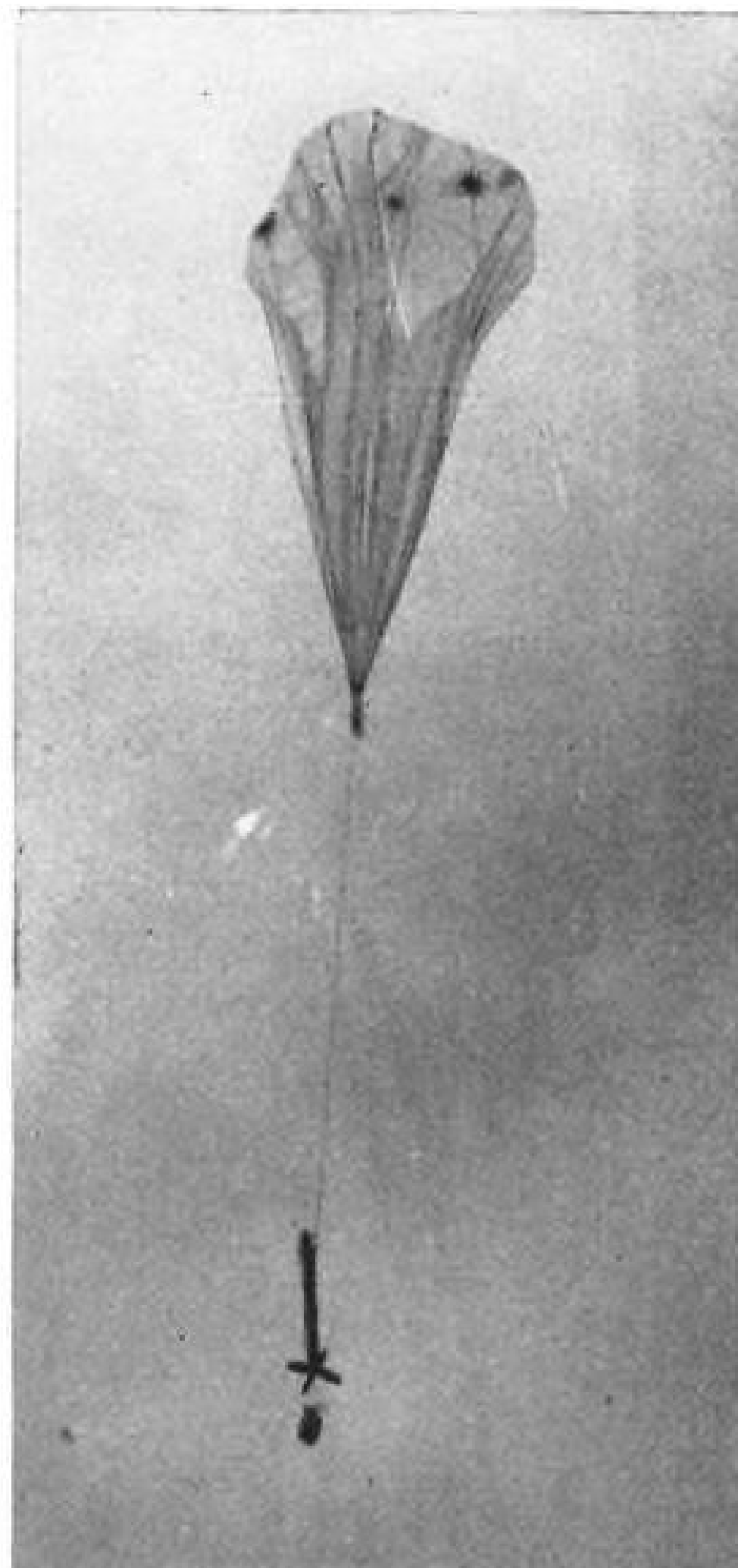
► **Balloon-Rocket Shots**—Most spectacular of the tests were the balloons carrying Navy Deacon rockets to altitude for automatic firings. Above most of the earth's atmosphere at the instant of firing, these rockets penetrated the lower strata of the ionosphere to altitudes of 40 mi.

The Deacons carried either a Geiger counter or an ionization chamber which measured cosmic radiation. Data was telemetered back to the U. S. Coast Guard Icebreaker Eastwind, which served as the floating mobile base for the experiments.

Another series of tests used the Skyhook balloons to carry nuclear emulsion plates, which measured the passage of cosmic radiation through photographic material. The plates were flown to about 90,000 ft., extending the range of data obtained during earlier experiments at lower altitudes.

► **Special Techniques**—Launching the balloons from the deck of an icebreaker required the development of special handling and launching techniques, be-

cause the deflated balloon length was about 180 ft., and the available deck area of the Eastwind was only about 60 by 60 ft. Furthermore, when the balloons were inflated with helium, they



GOING UP, Skyhook carries Deacon rocket for discharge to 40-mi. altitude.

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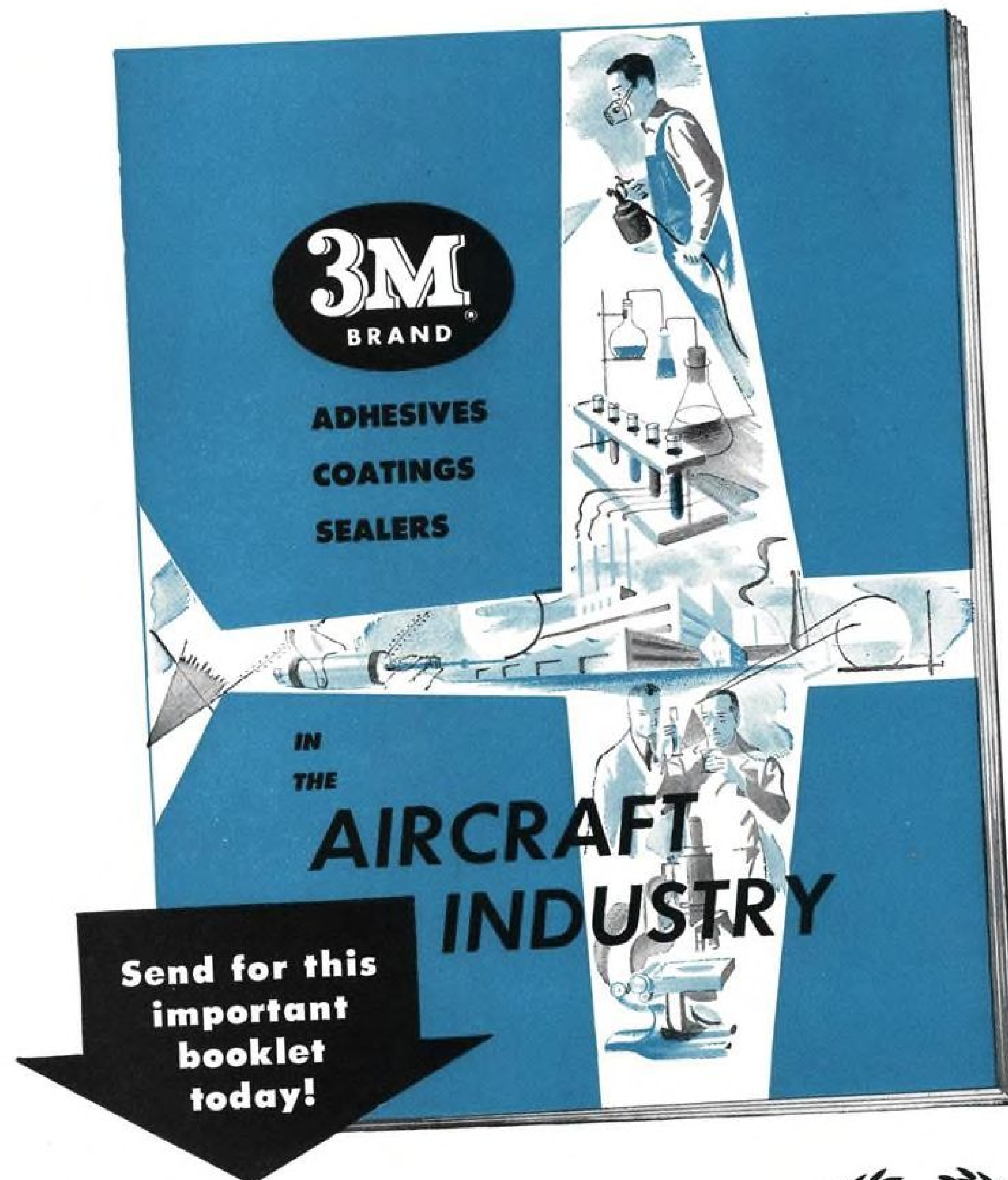
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DEACON ROCKET ASSEMBLY is checked by State University of Iowa scientists, before high-altitude launching. Rockets are 10 ft. long, have diameter of 8 in.

towered about 150 ft. above the deck. Trying to launch in any wind at all would have resulted in damaged balloons and aborted flights, so the ship had to nullify the wind by steaming downwind. In water dotted with huge icebergs or completely covered with ice, this was not an easy task.

In spite of that, all 14 scheduled flights were launched, and eight of these flights completed their tests successfully.

The site for the experiments was as near the geomagnetic pole as possible. This area was chosen because at the

pole, the earth's magnetic field produces a minimum influence on incoming cosmic ray particles. Measurements in this region represent the closest approach to "pure" cosmic radiation condition on earth, it is believed.

These experiments are part of a program being carried out by the Office of Naval Research and the Atomic Energy Commission. General Mills, Inc., built the balloons at its Aeronautical Research lab, scientists from the State University of Iowa controlled the rocket-balloon shoots, and scientists from New York University the balloon runs.

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Convair B-36H Flight Deck

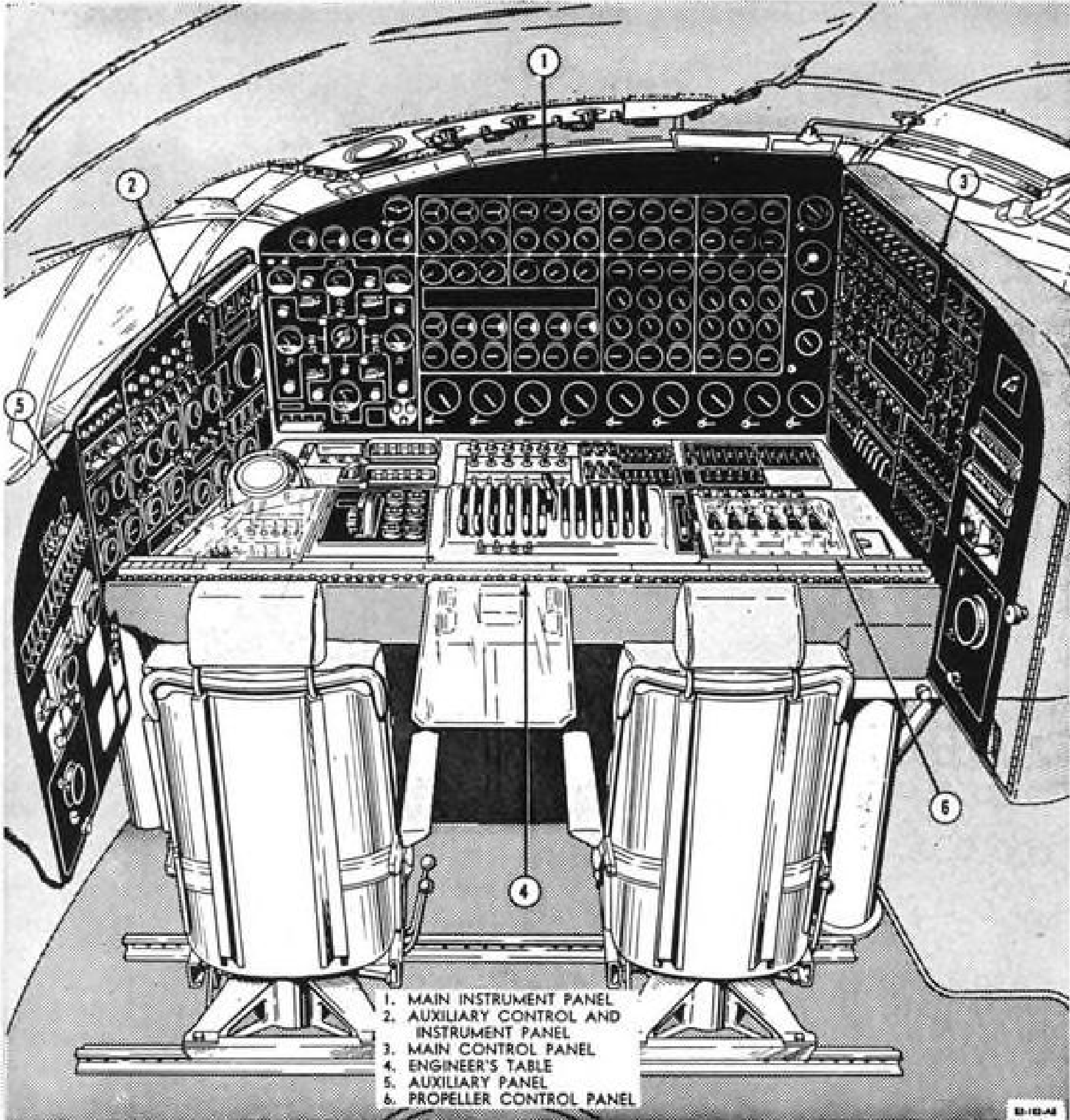
Here's the first detailed glimpse into the new Convair B-36H bomber's cockpit, showing provisions for the airplane commander, navigator and flight engineers.

This latter station (right) is the major change in the H over previous B-36 models. Two flight engineers now are carried, one to assist during take-offs and landings and during long missions, which often stretch out to 30-40 hours.

Improved night lighting at the various cockpit stations and better radar and other electronic devices have also been fitted to the B-36H.

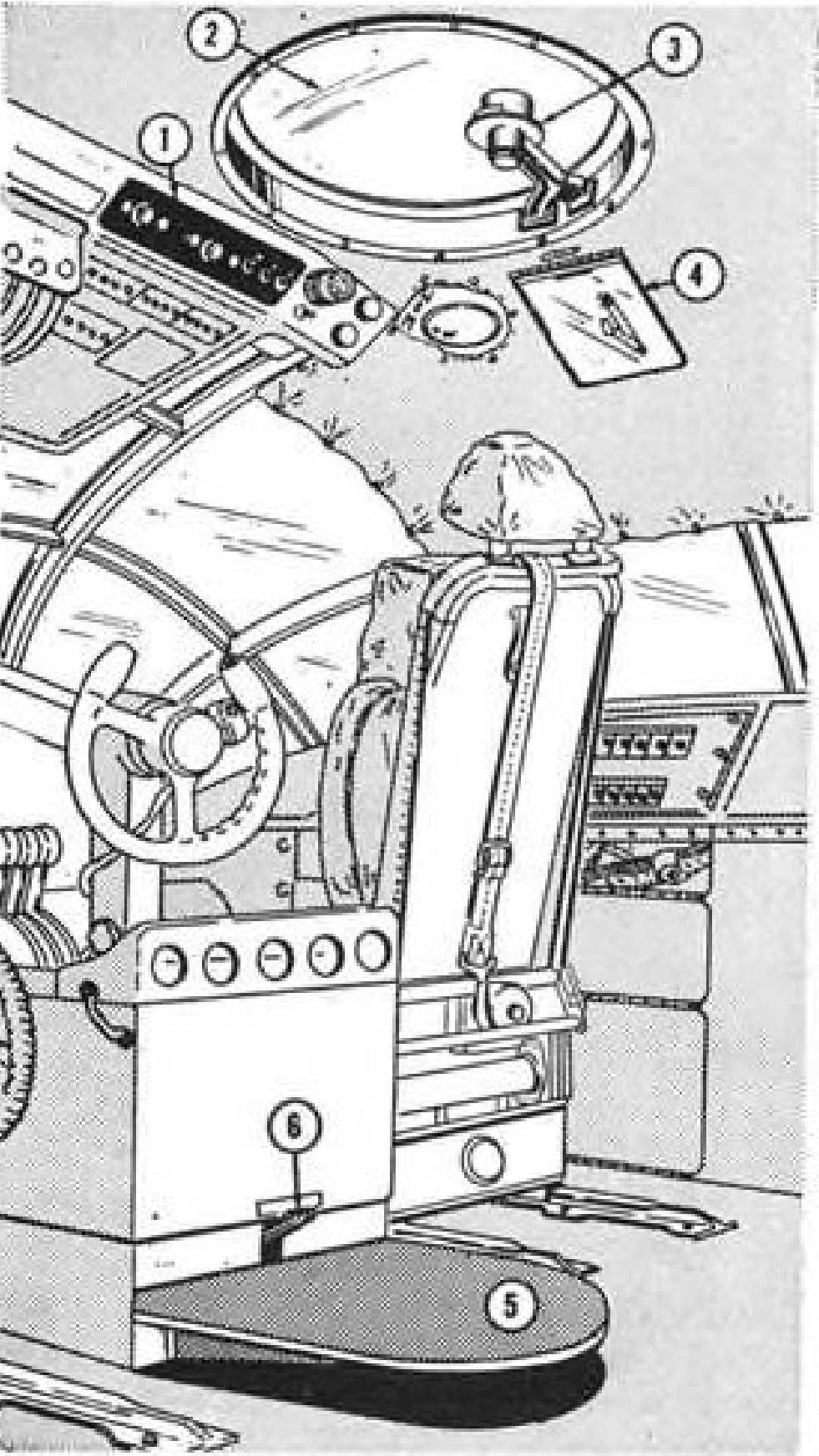
The big bomber, which will be in production at Ft. Worth, Tex. into 1954, has six 3,800-hp. P&WA R4360s and four 5,200-lb. thrust GE J47 jet engines.

B-36 units are being activated at two additional USAF stations: Walker AFB, N. M., and Ramey AFB, Puerto Rico.

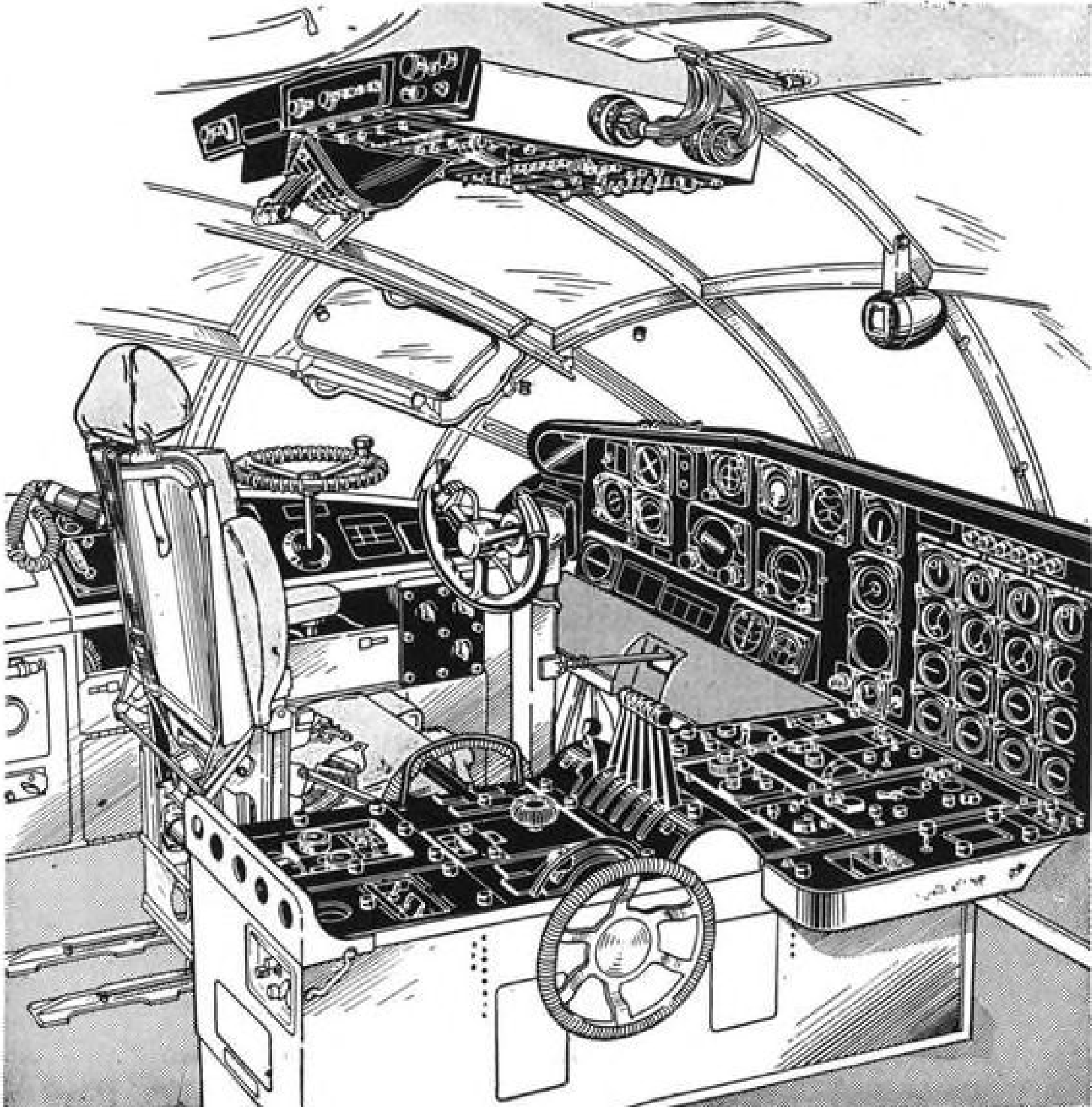


ABOVE: Two-man flight engineer station is located directly behind B-36H's pilots.
BELOW: Airplane commander's post in B-36H. Overhead are throttles for J47s.

BELOW: Navigator's work station.



1. NAVIGATOR'S ASTRODOME
2. CONTROL PANEL
3. CLIP BOARD
4. SIGHTING PLATFORM
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FINANCIAL

Projected Aviation Sales & Earnings

AIRCRAFT BUILDER	Sales			Earnings per Share		
	1951	1952e (millions omitted)	1953e	1951	1952e	1953e
Boeing.....	\$337.3	\$400	\$700	\$4.40	\$7.00	\$8.60
Curtiss-Wright.....	176.6	325	450	.71	.90	1.35
Douglas.....	225.2	490	625	5.76	7.50	10.00
Grumman.....	167.7	250	260	2.73	3.75	4.10
Lockheed.....	237.2	400	500	2.55	3.35	4.80
Martin.....	68.5	135	175	19.55(d)	.25	2.30
North American.....	177.7	285	375	1.87	2.25	2.75
Republic.....	130.4	280	290	2.92	5.35	5.60
United Aircraft.....	417.5	600	750	4.06	4.25	5.75
AIRLINE						
	Gross Revenues			Earnings per Share		
American.....	\$163.0	\$180	\$200	\$1.42	\$1.70	\$1.95
Eastern.....	98.3	125	140	3.02	3.50	3.50
Northwest.....	54.7	55	57	1.64	1.25	.75
Pan American.....	188.6	215	245	1.07	1.25	1.40
TWA.....	144.9	160	180	3.50	2.25	3.15
United Air Lines.....	127.8	154	170	3.58	3.65	3.50

e—Estimated. d—Deficit. SOURCE: The Value Line.

Continued Rise Seen in Air Curve

The aviation outlook continues bright despite spreading uncertainties. This view is expressed in the current issue of Value Line, an investment advisory service, in examining the status of the aircraft and airline groups.

Included with the general industry surveys are specific forecasts of 1953 sales, earnings, and dividends for the individual companies usually appraised by the service.

► **Election's Effect**—The general observations of Value Line are of particular interest in view of conjecture surrounding the future level of aircraft procurement under a new Administration publicly committed to a drastic cut in government expenditures. The service asserts:

• It would be foolhardy politically for a new Administration to slash aircraft procurement appropriations in the present atmosphere of international uncertainty.

• The fastest method to arrest any recession in business activity which might develop, and the one most acceptable to the voters, would be an acceleration of armament expenditures.

► **Room for a Rise**—Assuming that defense expenditures will continue (as now programmed) at a record rate for peacetime over the next few years and that the excess profits tax will be lowered next year and removed in 1954, Value Line forecasts that earnings and dividends of aircraft manufacturing

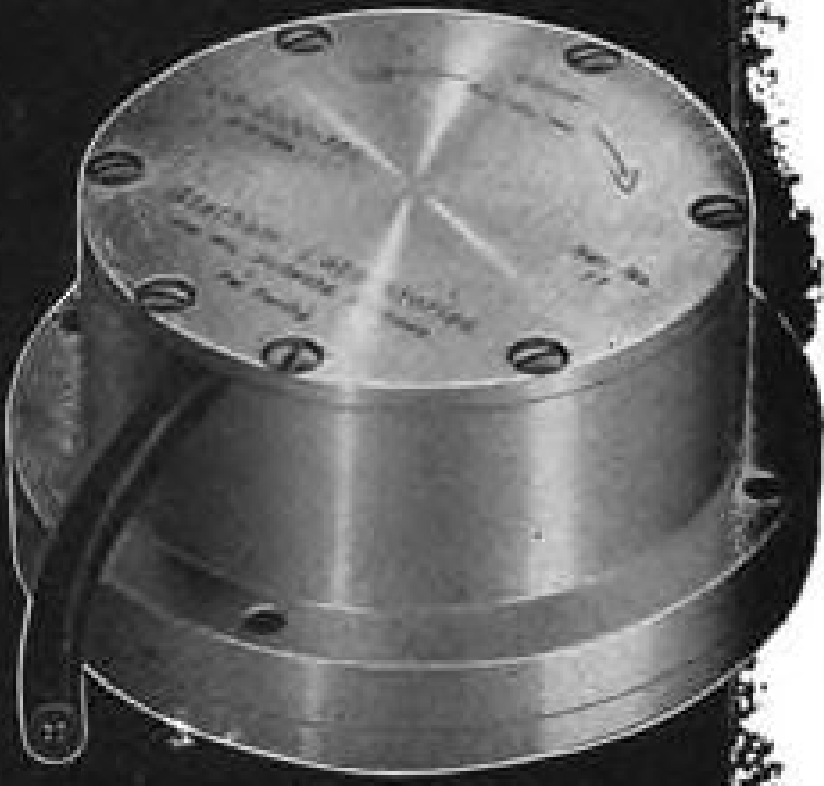
stocks will increase sufficiently over the next three years to justify market prices up to 140% higher than those currently prevailing.

In projecting the level of business now available, the service declares: "Present order backlogs amount to about three years' business on average at the 1952 rate of deliveries. While (1952 sales volume will run about 70% above the 1951 level), there will be further production increases during the first half of 1953 so that sales of aircraft companies in 1953 promise to show another wide gain."

Discussing profit margins, a further note of optimism prevails in the Value Line's assertion that "... the ratio of net income to sales is likely to improve somewhat if our assumption of a modification in the excess profits tax levy in midyear proves valid. We have projected 1953 earnings on the basis of a 51% normal-plus-surtax rate, a 22½% excess profits tax levy and a 65% over-all ceiling rate. These figures represent an averaging of current tax rates (52% normal-plus-surtax, 30% excess profits tax, and 70% maximum over-all rate) which we expect to be effective through June 30, with the lower rates which we expect Congress to make effective July 1 (namely, a 50% normal-plus-surtax rate, a 15% excess profits tax levy and an over-all ceiling rate of 60%)."

► **Profit Margin Uncertainty**—As a re-

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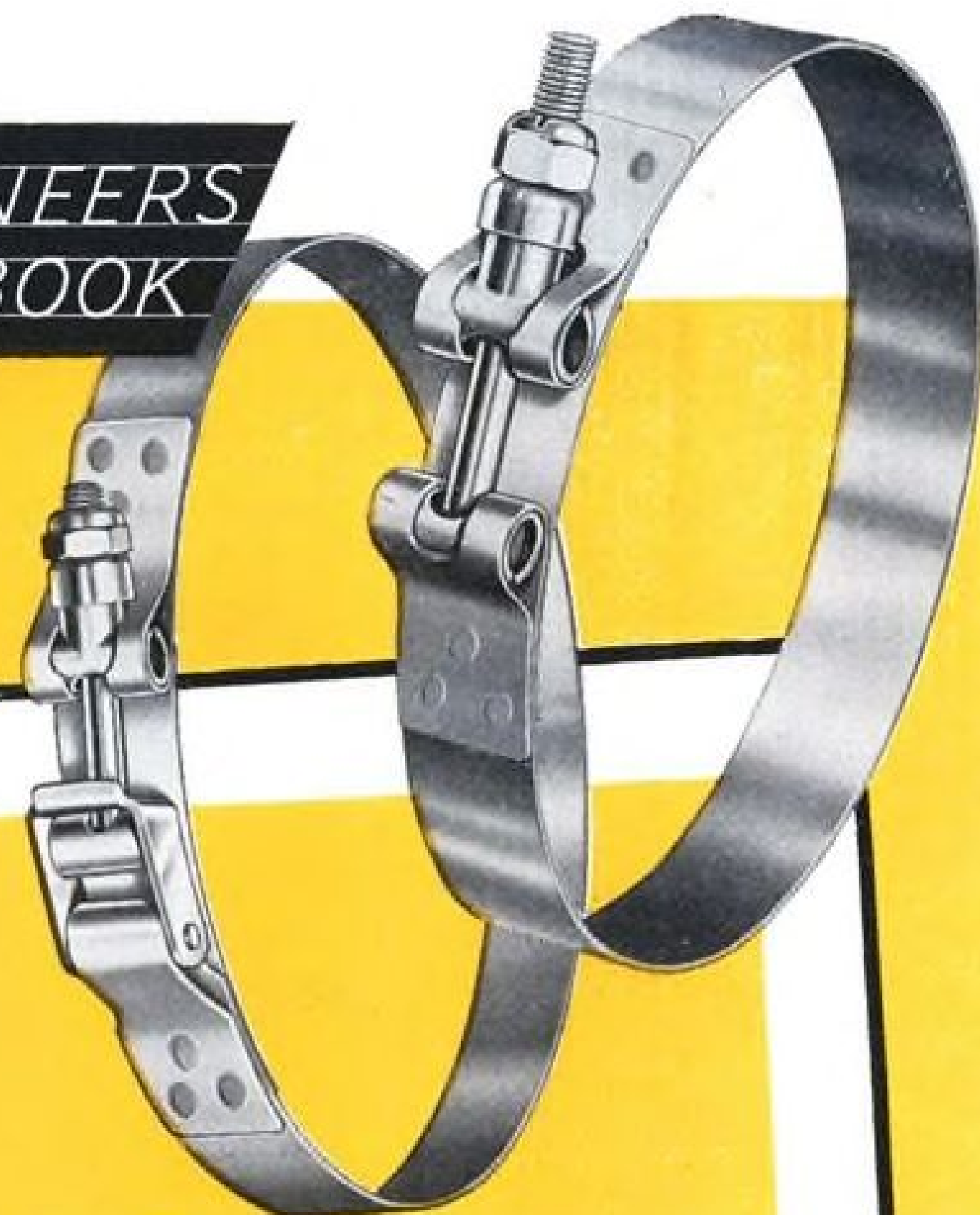


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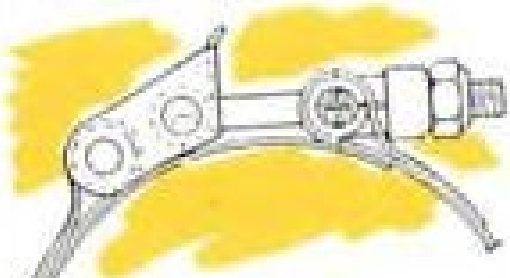
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ENGINEERS' NOTEBOOK

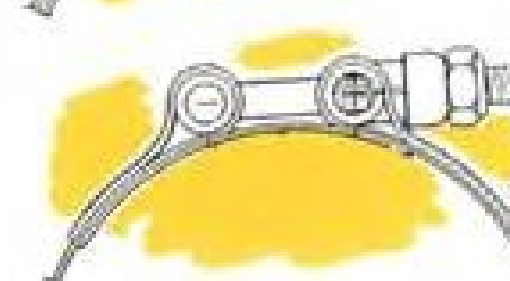


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sult, the investment service looks to ultimate profit margins of between 3% and 4%. At present, with most aircraft companies paying the 70% maximum tax rate, net income is averaging about 2% of sales. Other observers, however, believe that, once the excess profit tax is removed, military contracting officers may take this factor in consideration in the price redetermination processes when viewing profit margins.

The specific sales and earnings estimates for the nine aircraft companies analyzed in detail by Value Line are summarized in the table on p. 33.

► **Air Transport**—In reviewing current trends in the air transport group, the advisory service notes some improvement in earnings for the current half. The increase in traffic witnessed earlier in the year appears to be accelerating with third-quarter reports revealing a better control over expenses. Nevertheless, full year earnings will be down sharply, possibly by as much as 25%.

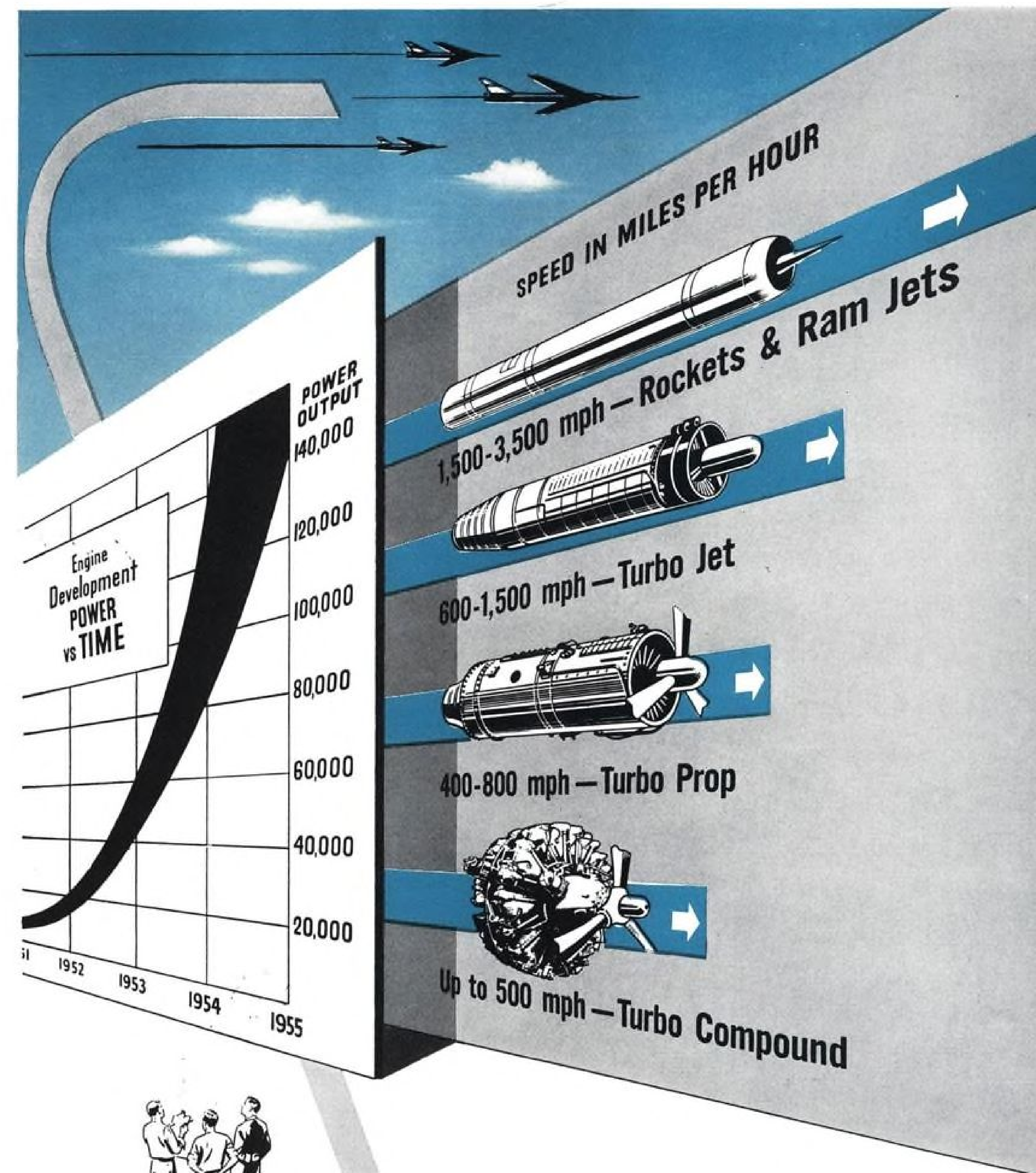
The expanding capacity of the industry in the form of new equipment to be delivered, together with the increasing popularity of air travel, is credited by the service as leading to new high revenues for the group in 1953.

A cautious tone on the profits outlook is noted, however, with the observation that, despite higher revenues and important operating economies to be derived from the use of the new equipment, earnings are not expected to register a wide increase in 1953. The heavy expense of integrating new planes into operating schedules will have to be charged to income, while higher interest and depreciation charges will drain off a large portion of the increase in revenues. At the same time the expected extension of aircoach travel will weaken rate structures and put further pressure on operating margins.

On balance, earnings are expected to be moderately higher, although individual results again will differ markedly from the industry norm.

► **No Jets Soon**—Jet transport developments are appraised by Value Line with the observation, "Despite . . . considerable publicity . . . only limited and experimental service patterns are likely to exist on commercial routes before the late Fifties. Introduction of the turboprop engine, however, could come a great deal sooner. While most of the new planes currently being received are equipped for conversion to turboprop, such a switchover would, nevertheless, entail substantial capital expenditures." The outlook in gross revenues and earnings for the airlines are also summarized in the table.

(The opinions reviewed are those of Value Line advisory service and not necessarily those of this writer. Neither the writer nor AVIATION WEEK sponsors or endorses the service.)—Selig Altschul



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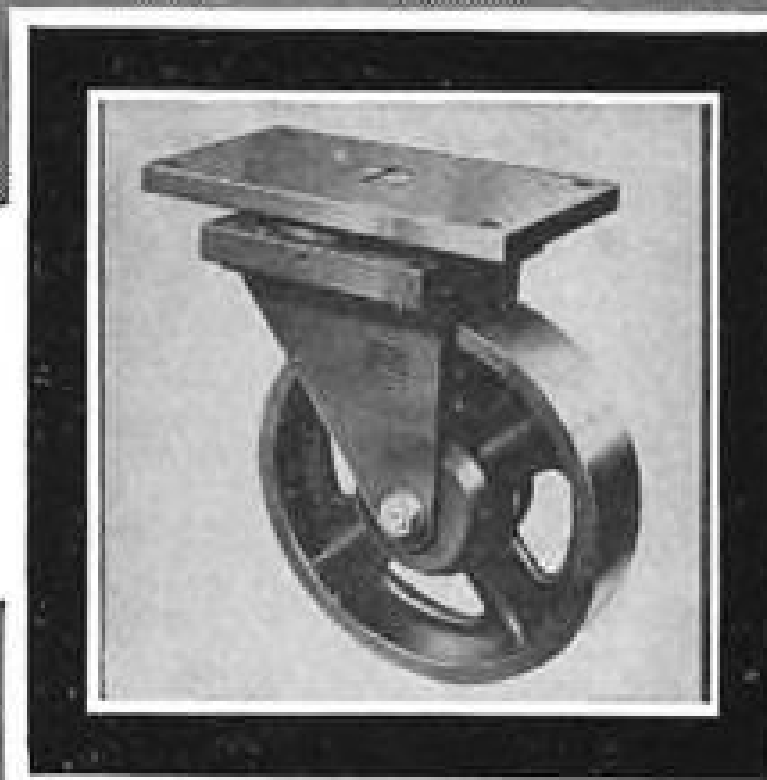
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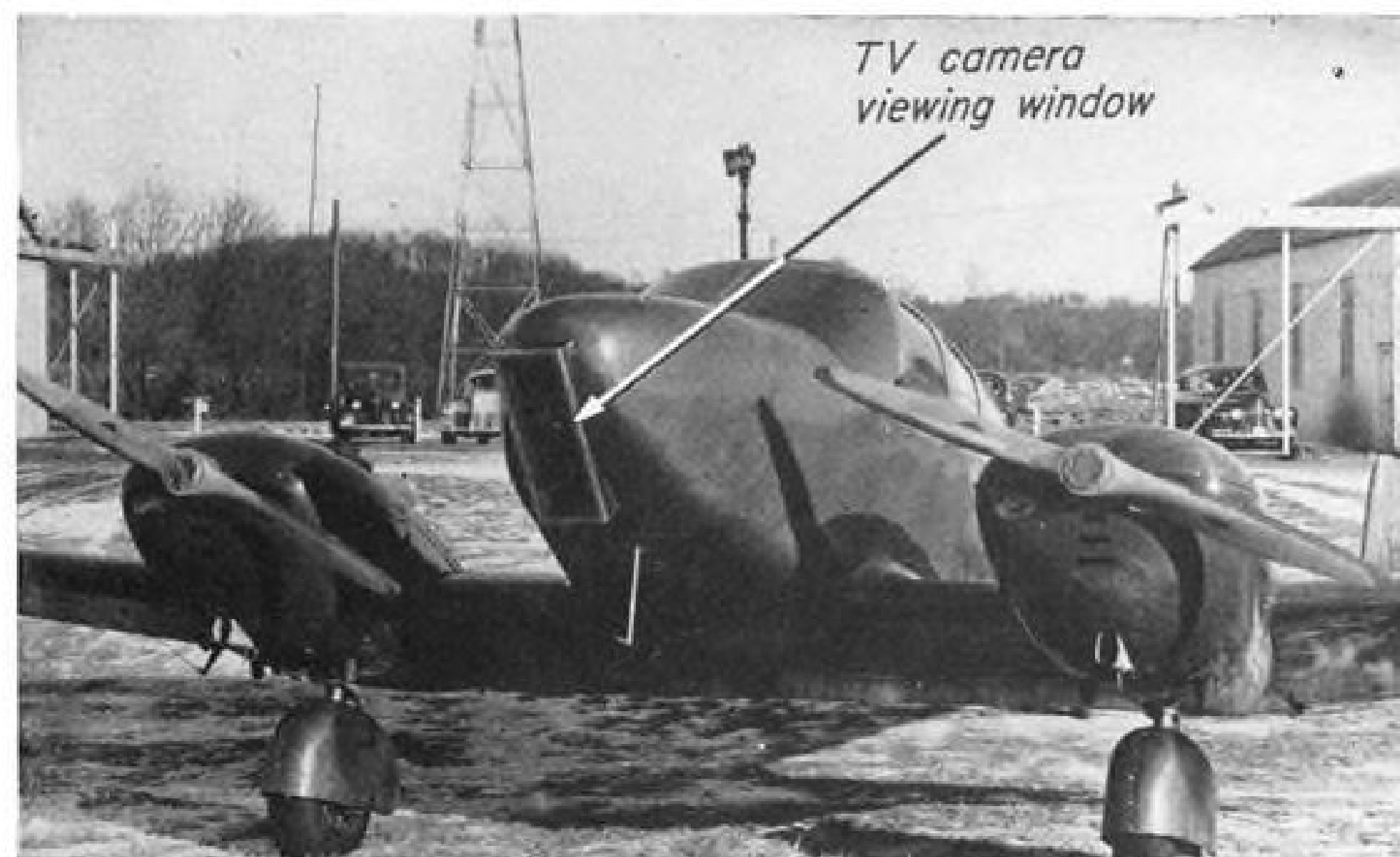
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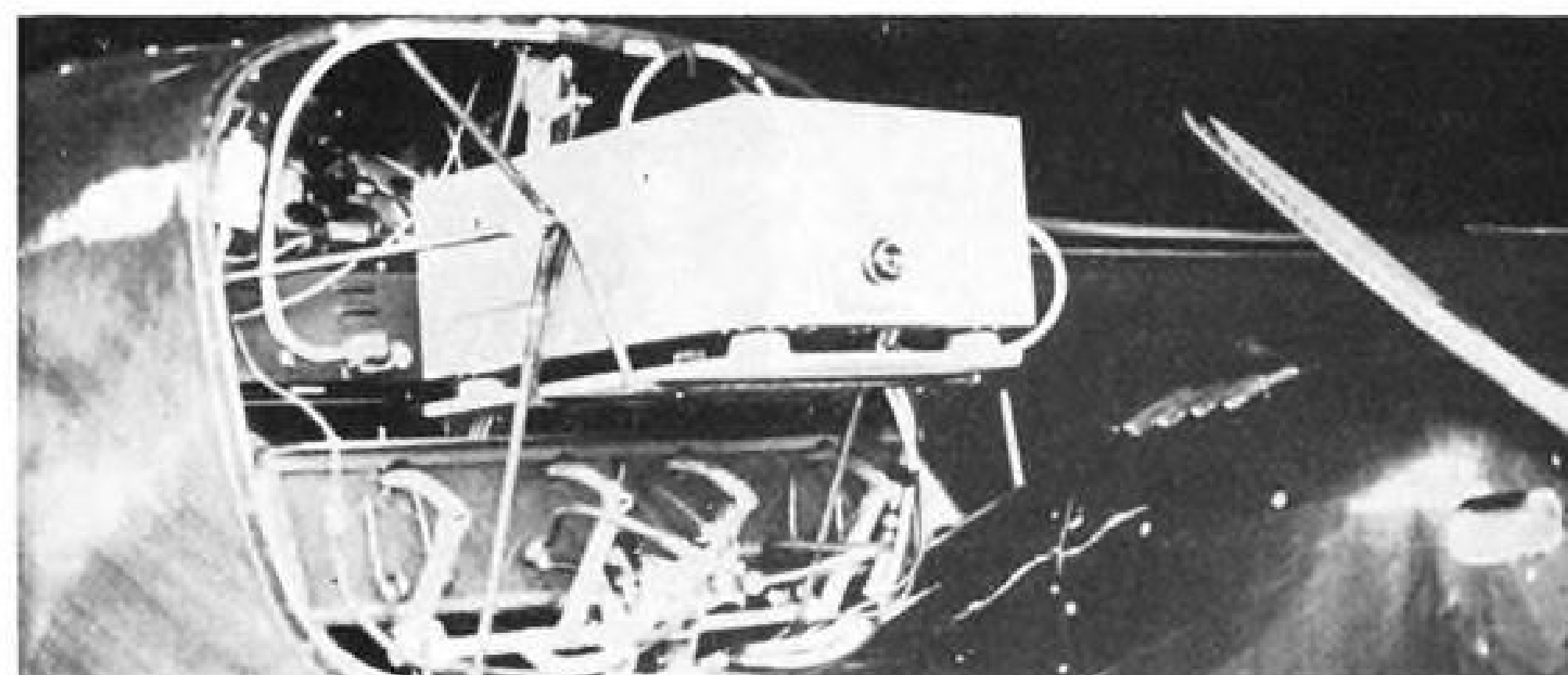
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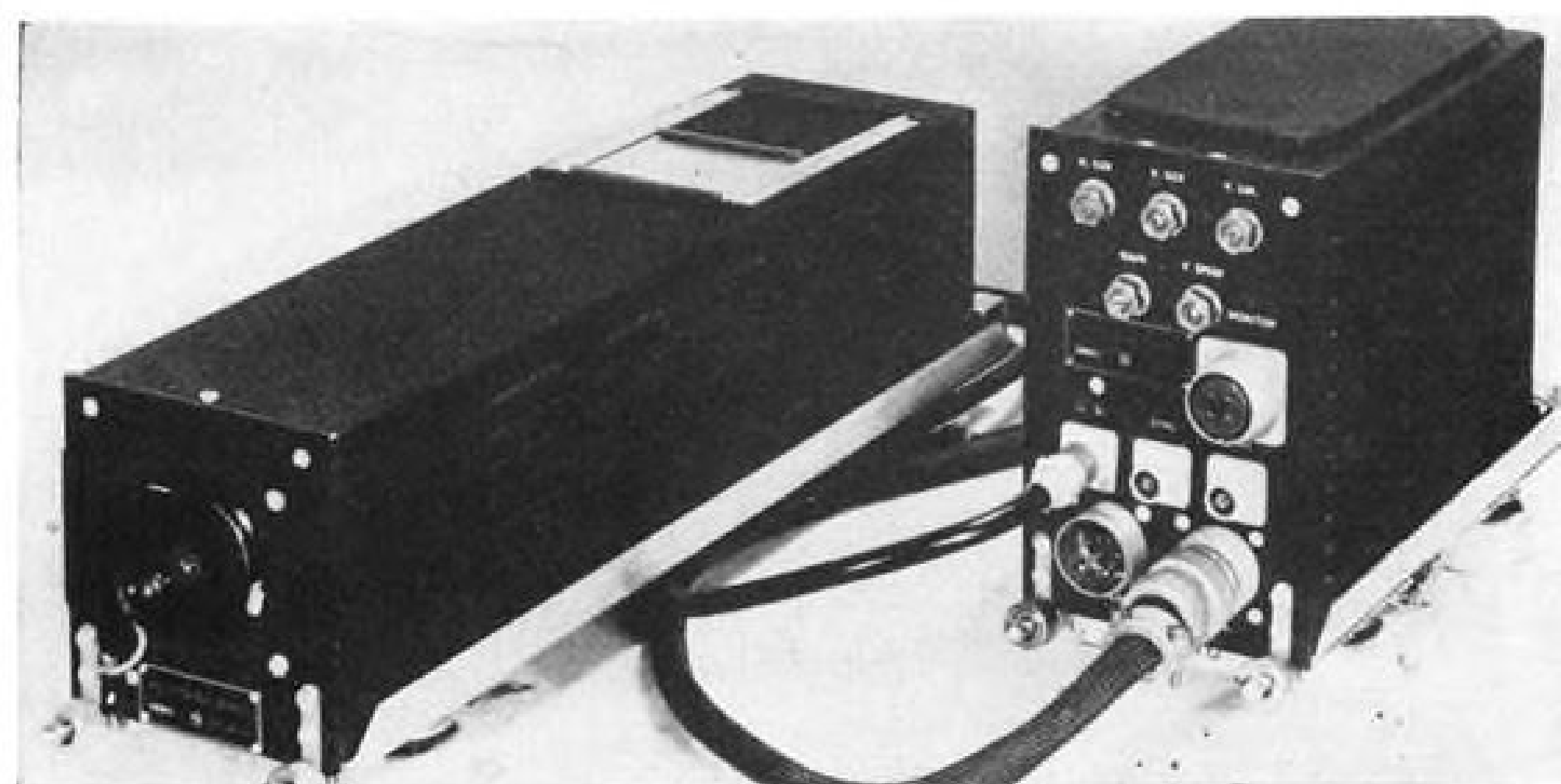
How the Navy Drone Got Its Eye



1 First successful "television eye" for pilotless drone aircraft, and the forerunner of the recently announced Navy drones used in Korea, was developed by Remington Rand and flown in this plane during early years of World War II, the company says.



2 Known as the RR-7 Positive Bombsight, the original equipment was quite bulky and heavy (160 lb.). The TV transmitter operated in the 760-to-920-mc. (UHF) region. Camera, shown installed in early test plane, weighed 60 lb. and occupied 5,000 cu. in.



3 Continued wartime development resulted in this Vericon camera weighing only 20 lb., and whose size was only 550 cu. in. The camera contained a motor and control which automatically adjusted lens aperture to brightness of scene being viewed.



This is the Boeing team's jet heavyweight

Here is a flight shot of the giant Boeing B-52 Stratofortress. An eight-jet heavy bomber, the Stratofort is a fast, husky teammate to the B-47 Stratojet medium bomber. It's 153 feet long, measures 185 feet from wing-tip to wing-tip, and is powered by eight Pratt & Whitney J-57 engines. Speed and other performance details are carefully guarded secrets.

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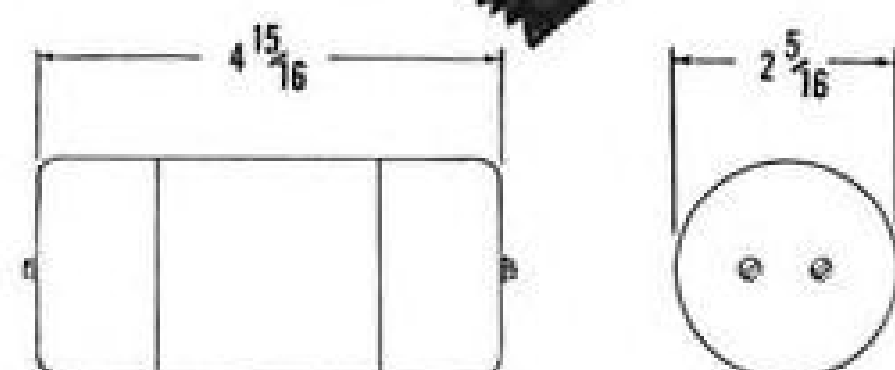
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Light Beams Mark Plane Rate of Drop

Rate of descent during the last instant before touchdown for new Navy planes undergoing carrier qualification tests can be instantly determined by new touchdown rate-of-descent indicator shown aboard the U. S. S. Midway. Nicknamed TRODI, the new equipment, developed by North American Aviation, replaces a much slower, more tedious method involving cameras. The device was used in recent carrier tests of NAA's FJ-2 Fury (AVIATION WEEK Nov. 10, p. 11).

A TV-camera-like pedestal sends out two parallel beams of light, separated vertically by one foot. The beams, very thin vertically and fan-shaped in the horizontal plane, are reflected by a mirror system in the incoming plane. A capacitor-charging circuit measures the time from the instant the incoming airplane cuts the first beam until it intersects the second beam. This interval is instantly converted into rate of descent in feet per second with an accuracy of 0.4 ft./sec.

FILTER CENTER

► **USAF Gets Zero Reader Run-Down**—One of Sperry Gyro's DC-3s has completed a 10-week tour of 18 USAF bases in the U. S. and Alaska to demonstrate tactical uses of Sperry's military version of its Zero Reader flight director. Airline and airframe personnel in Canada and along the West Coast also got a chance to fly Sperry's commercial Zero Reader and A-12 Gyropilot during the tour.

► **GCA Radar "Save"**—Recently, while visiting the N. Y. International Air-

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port control tower to see its new "taxi radar" in operation, we got an unscheduled demonstration of a GCA radar "save" of a disabled Air Force C-46. We also learned first hand the need for adding a radio direction finder to GCA and the need for radar beacons.

Air Force 7427 had missed a 500-ft.-ceiling instrument approach at Mitchel AFB, 10 mi. northeast of Idlewild. During the go-around, the C-46 lost one engine and the other was overheating badly. Fighting to gain altitude while nursing the remaining ailing engine, the pilot got lost.

A disabled airplane, unsure of its position at 1,000-ft. altitude in instrument weather near a dense-traffic, highly populated area presented an obvious problem to the Idlewild tower, and to the pilot who talked of ditching. Jim Flannery, night chief of the CAA tower staff took charge in the VFR tower room.

Not having followed the initial course of the C-46, the question in the Idlewild tower was: Which of the many blips on the radar scope was the disabled plane? At its low altitude, and probable distance from Idlewild, it was possible that the C-46 wouldn't show up on the surveillance radar.

If the C-46 had been equipped with a transponder beacon, it could have been instantly identified. Even a radio direction finder, scheduled to be incorporated in Idlewild's GCA soon, would have speeded identification. To ask the C-46 to execute an identifying maneuver at 1,000 ft. altitude, without first knowing its position, would have been risky.

Mitchel's tower called for a long-



RADIO TEST CHAMBER

This new Wright Air Development Center chamber has more than 4,000 sound-absorbing wedges which rid the room of echoes. The new chamber will be used to test USAF radio communications equipment. Engineer shown adjusting equipment is standing on grid-like floor which is removed before test begins; equipment is suspended from the ceiling by supports which are covered with sound-absorbing material.

count radio transmission to enable its radio direction finder to get a fix. The co-pilot's voice showed the strain as Mitchel called for another, and still another long count.

Idlewild thought it had spotted the C-46 blip, based on its reported heading. Then Mitchel got its fix; Idlewild identified the C-46 and gave the pilot his position, south of Mitchel.

In the C-46 cockpit, tension eased as evidenced by subsequent radio transmissions. The C-46 attempted another approach at Mitchel, coming down to 600 ft. without making contact. With a 12,000-ft. ceiling, moderate haze, reported at Idlewild, the C-46 pilot re-

quested a GCA approach there.

GCA operator Annunziato calmly vectored the C-46 into Idlewild, giving him continuous and reassuring position reports. At one point Annunziato thought he heard the C-46 speak of "trouble," and queried the pilot. "No trouble now, thank goodness," the pilot replied. Several miles out, the C-46 established visual contact and made a successful single-engine approach and landing.

When the plane was down, Annunziato left his radar scope for a smoke and to watch the C-46 taxi in. Mitchel tower radioed: "Radar man was very good."
—Philip Klass

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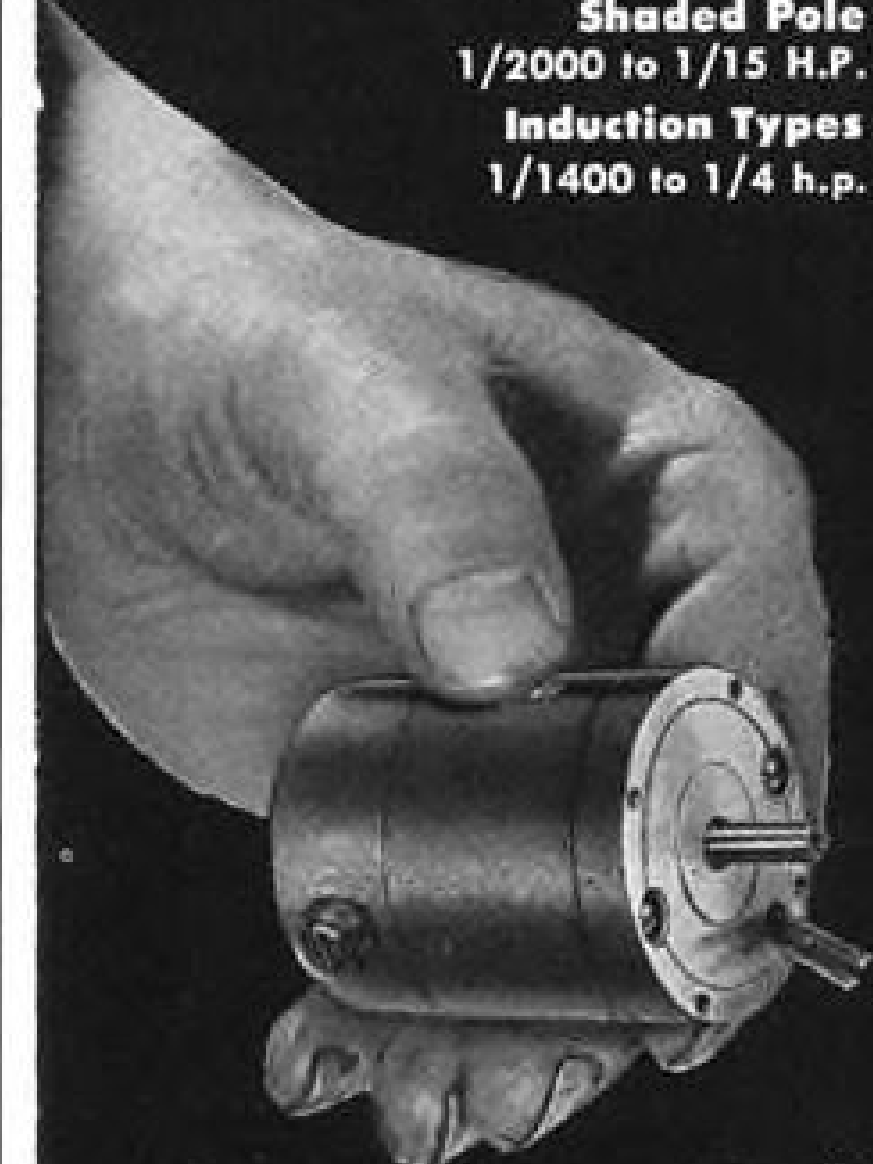
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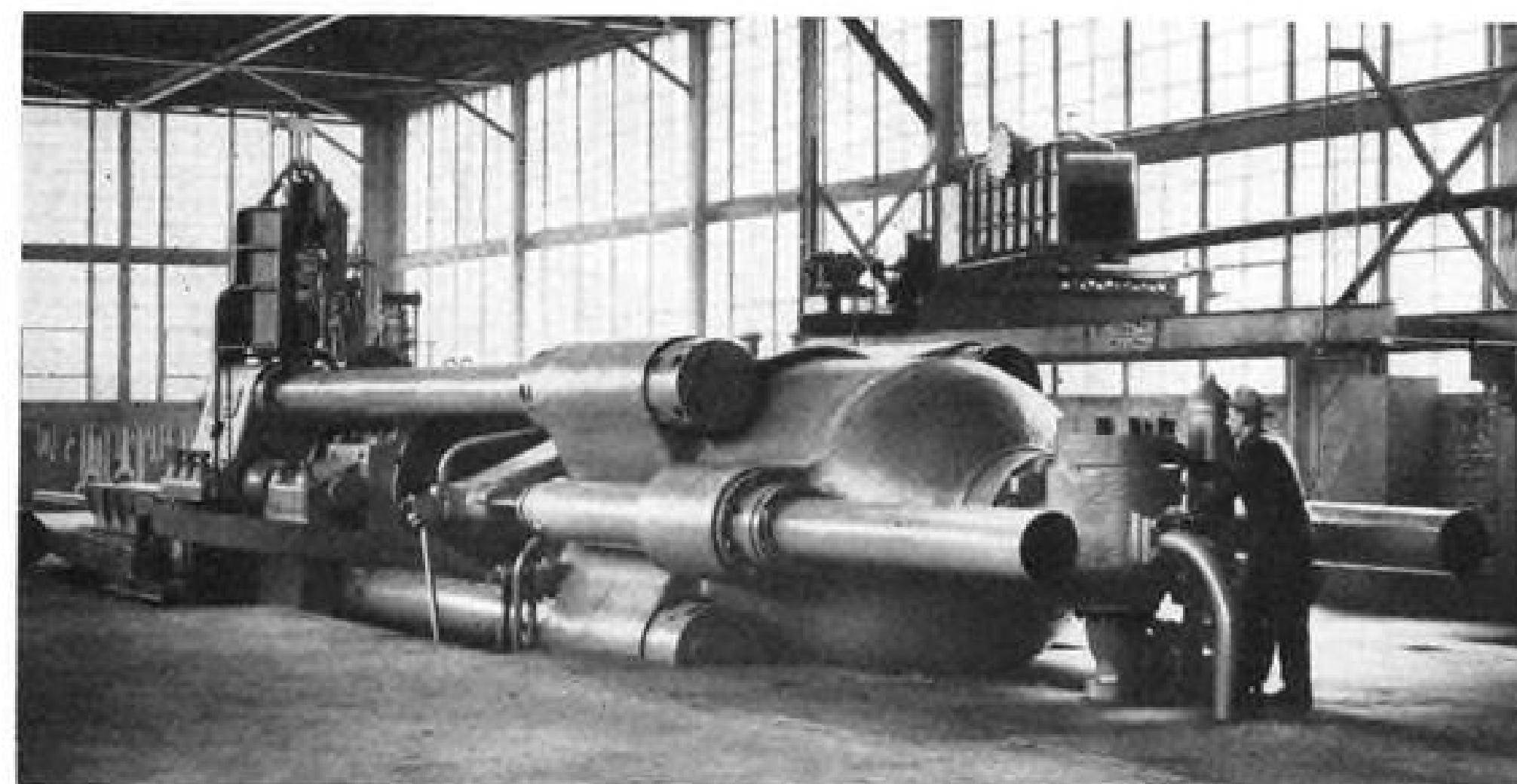
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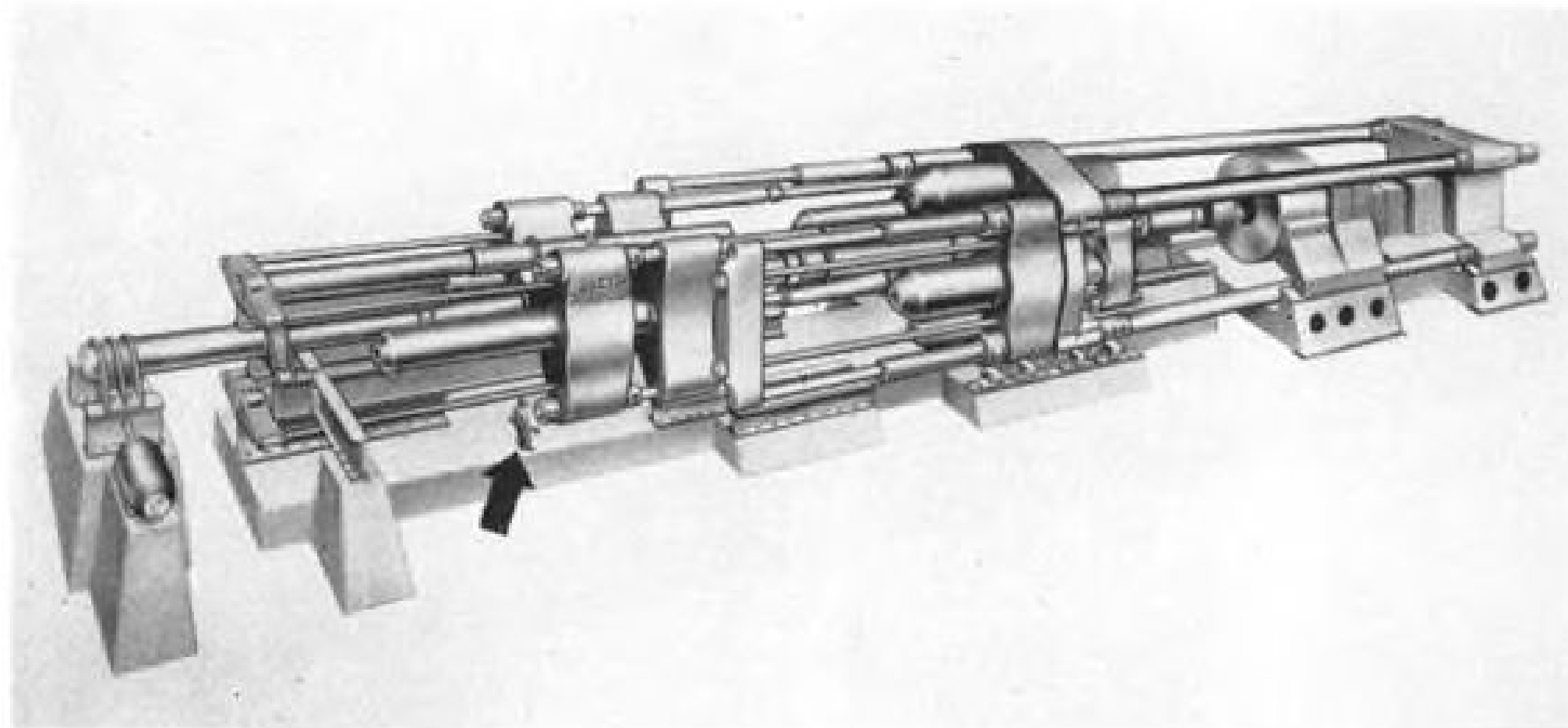
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LARGEST EXTRUDER TODAY is this 5,500-ton unit built for Canton Drop Forging & Mfg. Co. by Hydropress. There are three presses of this size now in operation.



LARGEST EXTRUDER PLANNED under heavy press program was this 25,000-tonner, engineering work on which has been nearly completed by Hydropress. There are no present plans to build it. Figure of man (arrow) indicates huge size of the machine.

Extruding Giants Coming Along

In a year these units should be squeezing out parts; they may also supply billets for heavy forge presses.

By Irving Stone

Big extrusion presses—little-heralded but vital counterparts of the giant forge machines in the Air Force's heavy press program—are being pushed to completion, to be fitted into the production scheme for military planes.

Six of the units are being built by Loewy-Hydropress, Inc., New York, and two by United Engineering & Foundry Co., Pittsburgh. In addition, the rebuilding of a couple of big German extruders is in the works. These presses are scheduled to go into service in late 1953 and early 1954.

► **Probable Uses**—Parts likely to be made on the heavy extruders are reported to include spars, braces, longerons, ribs, propeller blades, wing fittings, and in-

tegrally stiffened skin sections (cylindrical sections, later split and flattened into panels).

Many of these parts could be formed by forging, as well. But whether they will be made by extrusion or forging will depend on the particular design.

On the cost side, extruding has the advantage, it is reported, because die cost and maintenance are considerably less than in forging operations. Also, extruding will give parts with much closer dimensions to the finished requirement.

► **Big Billets Too**—Another place where the big machines are expected to play a large part is in the extruding of stock to be worked on the forge presses. This is being done now for the smaller presses and probably will be carried over

for supplying raw metal forms for the giant forgers under the heavy press program—it is reported that metallurgical characteristics of extruded stock are better than cast or rolled material in the big sizes as a result of the hot-working put into the extrusion.

► **New Potential**—The jump from today's extrusion press capacity to the tonnage of the "big fellows" in the coming press regime will be substantial, from the operator's point of view.

Production-wise, the presses will permit a tremendous step forward compared to the capabilities of present-day extruders.

The largest extrusion presses now operated in this country are three 5,500-ton units. The new presses will range from a smallest one of 8,000 tons to a largest of 20,000 tons, with 12,000- and 13,200-ton units in between.

► **Sizes Seen**—On the 5,500-ton extrusion press, the maximum size billet used is about 14 in. in diameter and can give an extruded cross-section of not more than 25 to 30 sq. in. Compared to this, the 20,000-ton press could use a billet of about 22 in. in diameter to produce an aircraft extrusion with a cross-section not exceeding 100 sq. in.

On the small press, a flat panel of about 30 in. in width can be extruded. On the 20,000-ton press, this dimension theoretically could be extended to about 90 in. However, a 60-in. width is seen as a good practical goal.

The new extrusion presses with smaller pressures than this biggest machine to be built under the program obviously will give proportionately smaller widths and cross-sections for parts. But in the over-all, the press designers and operators see the new potential as meaning real progress in the extrusion field.

► **Largest Contemplated**—Originally, a 25,000-ton extrusion press was included in the heavy press program. Like the 75,000-ton forge press of the program (AVIATION WEEK July 7, p. 38) there are at present no manufacturing plans for this 25,000-ton extruder, although engineering work on its design already has practically been completed by Hydropress, Inc., New York.

Dimensionally, it is about four times the size of the 5,500-ton Hydropress extruder operated by Canton Drop Forging & Mfg. Co.—222 ft. long and 30 ft. high, against the smaller unit's 51-ft. length and 7 ft. 10 in.-height.

This 25,000-ton size is considered the limit in the light of present-day technology, considering the stresses that would be imposed on the machine. For any larger size, an entire new design approach would have to be employed.

Even with a press of the 20,000-ton category, the machine "breathes" about one inch in each direction. This condition is only one of the operating prob-

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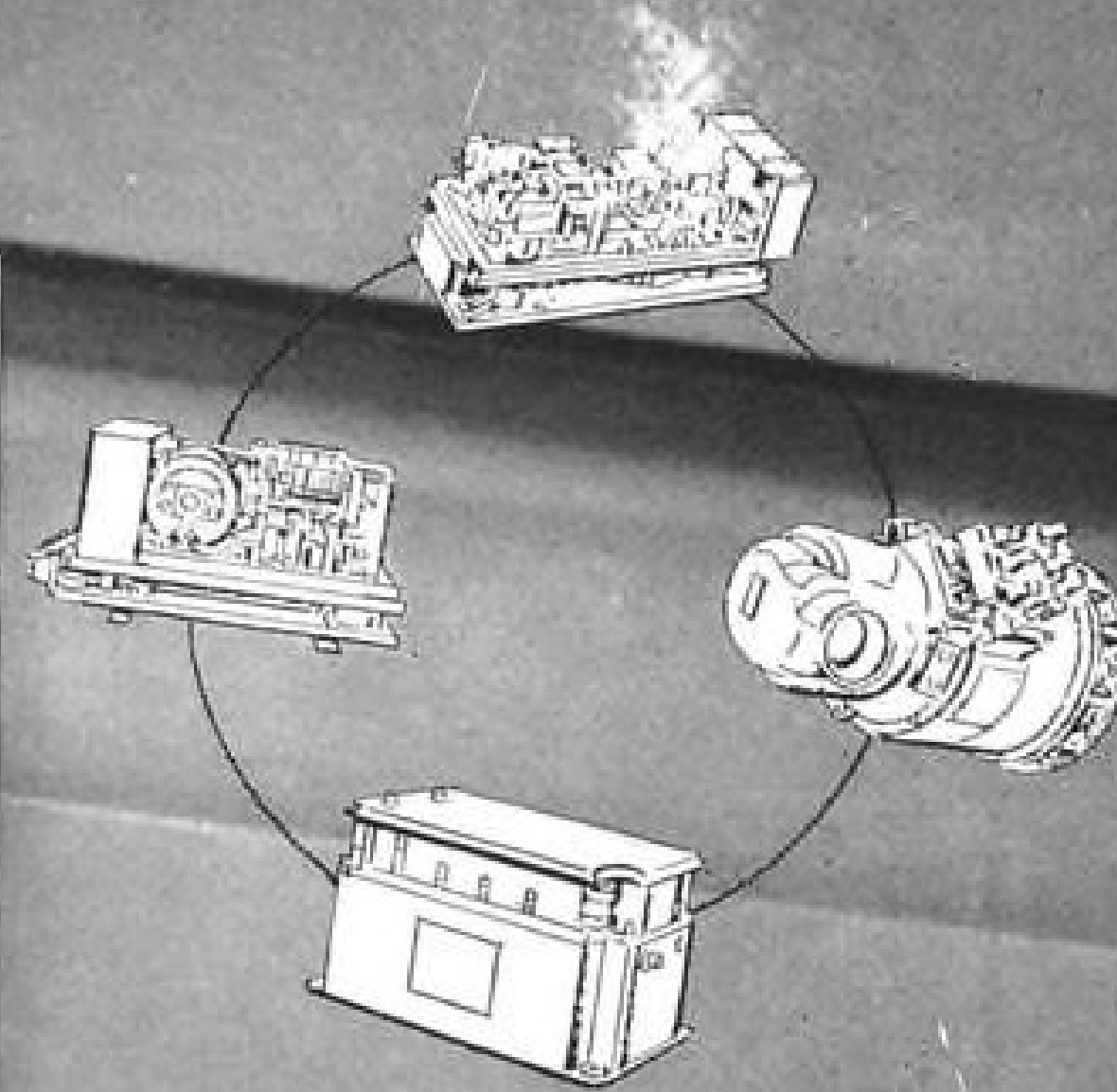
R. S. V. P.

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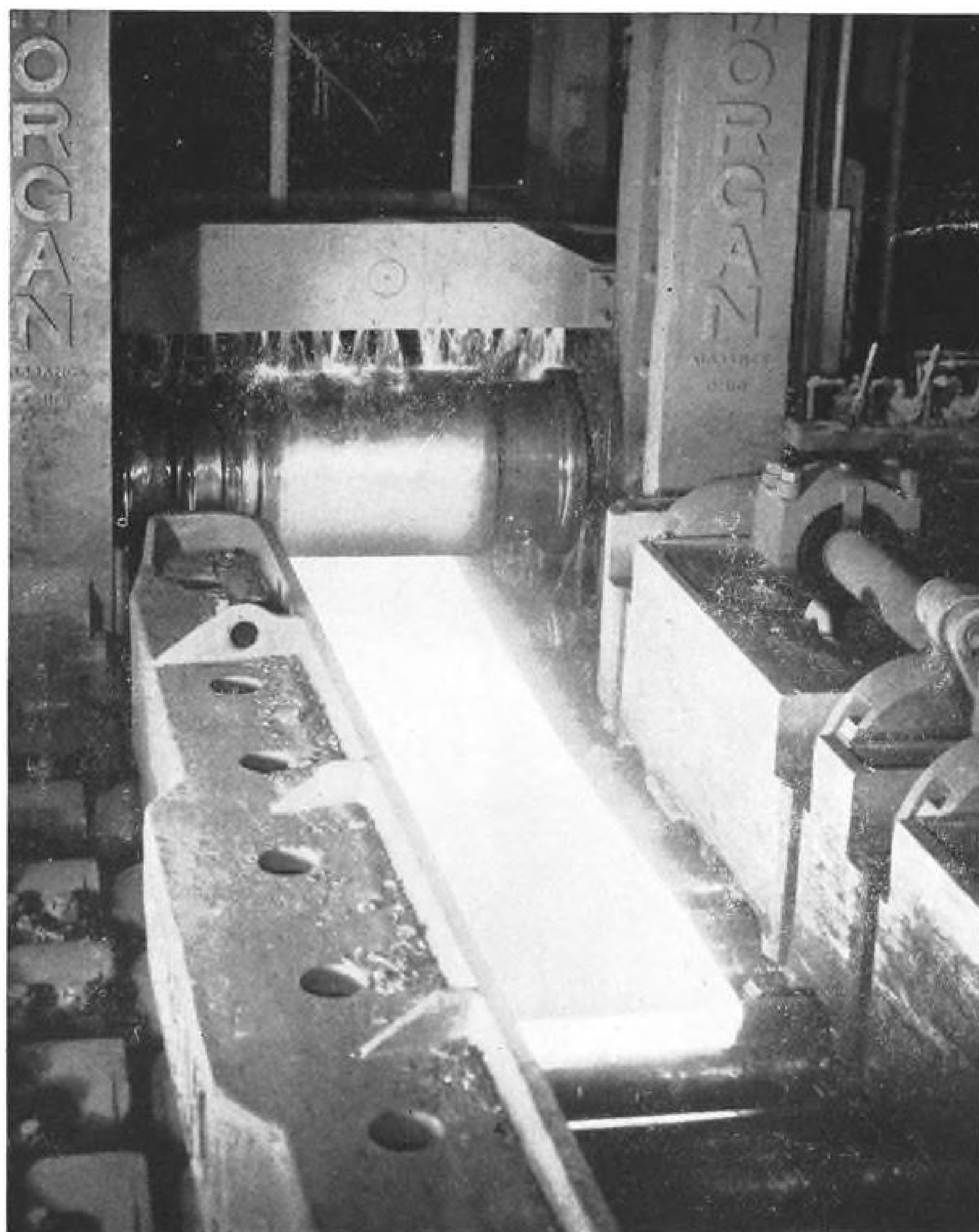
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lems that would necessitate radical design changes in sizes above 25,000 tons.

► **First in 1953**—Of the extruders now being readied under the heavy press program, the first is scheduled to go into operation late in 1953. This will be a 13,200-ton, rebuilt press being constructed by Schloemann in Germany.

Eight more extrusion presses are scheduled to go to work in January 1954—about the same time that the first new heavy forge press (50,000 tons) is to go into operation. These eight will be a 20,000-ton, 12,000-ton and four 8,000-ton units constructed by Hydropress, and a 20,000-ton and 12,000-ton unit by United Engineering.

Latest information indicates that still another extrusion press is being added to the previous total of nine in building. This is reported to be a 13,200-ton rebuilt Hydraulik (German) unit.

► **More Familiarity**—It is believed that aircraft engineering personnel will require less indoctrination to design into the large extrusion presses than will be required with large forge presses.

A considerable background of extrusion design knowledge has been carried over from the last war. Parts are already being laid down on the drawing boards for execution on the large-size extruders that soon will come into the picture.

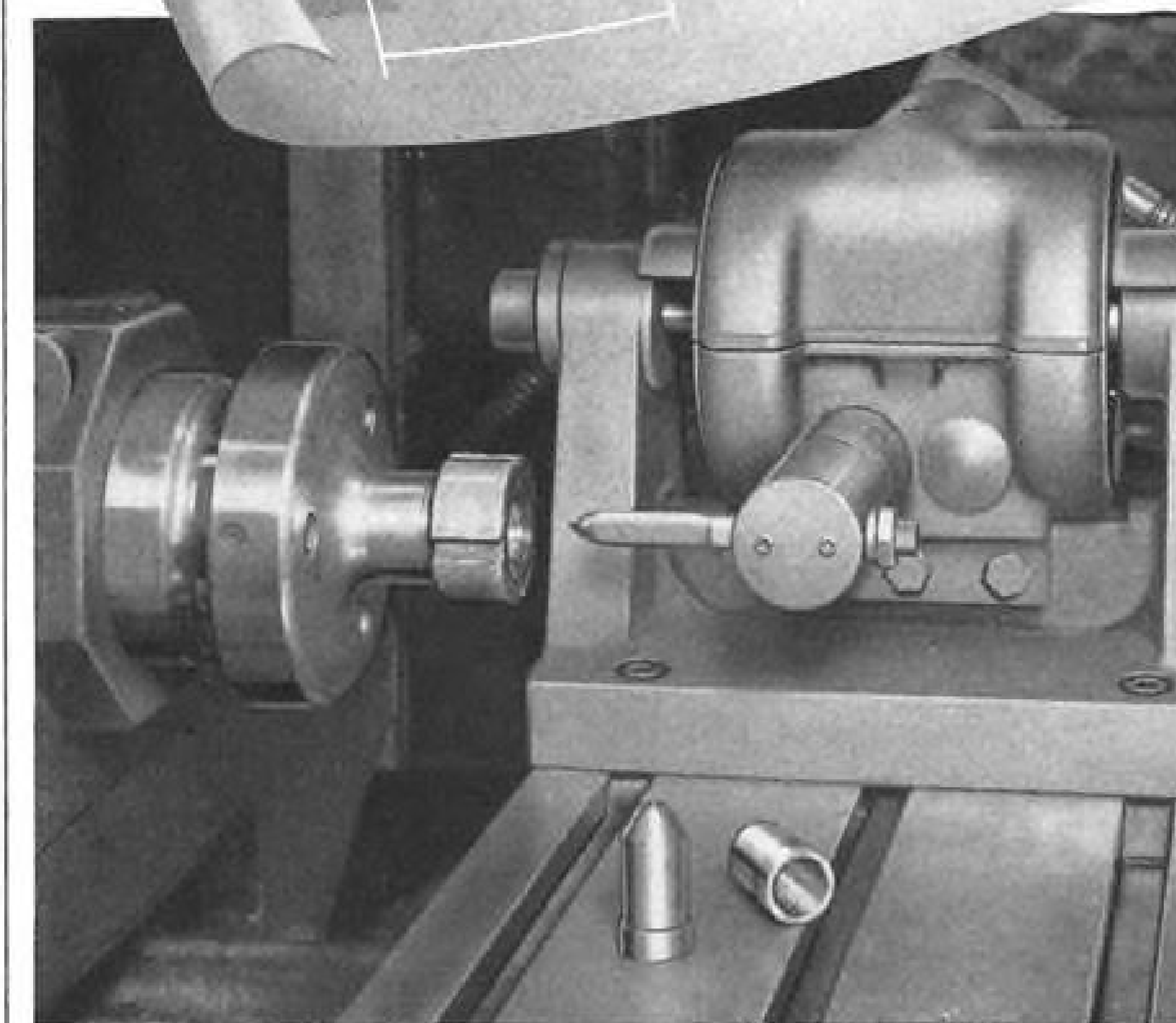
► **Commercial Role Probable**—On the commercial side—when the emergency is over—the picture looks brighter for continued use of the large extrusion than it does for their heavy forging counterparts.

While it is generally agreed that the large forge presses will only be used as standby units for the military, and with very limited usage for experimental work, it is expected that the large extrusion presses will be used for turning out large structural sections for commercial applications.

This application is seen justified because there are no rolling facilities available to produce these very large parts. Also, the extrusion press is suitable for short runs—set-up time is less and die cost is relatively low compared with forging dies or rolling mill rolls.

► **Only One for Steel**—Until a few years ago, the extrusion process was confined to non-ferrous metals. The first extruder for steel was a 4,000-ton Hydropress unit that went to International Nickel Co. at Huntington, W. Va., in 1943. Since then, a few presses originally designed to work aluminum alloy were converted for steel extruding by Hydropress, and in 1951-52 two more steel-extrusion units—2,500-ton presses were built by the company.

Only one of the ten extruders in the heavy press program is being built to squeeze out ferrous metal parts. This one—a 12,000-ton unit—will go to Curtiss-Wright Corp., Buffalo. All the oth-



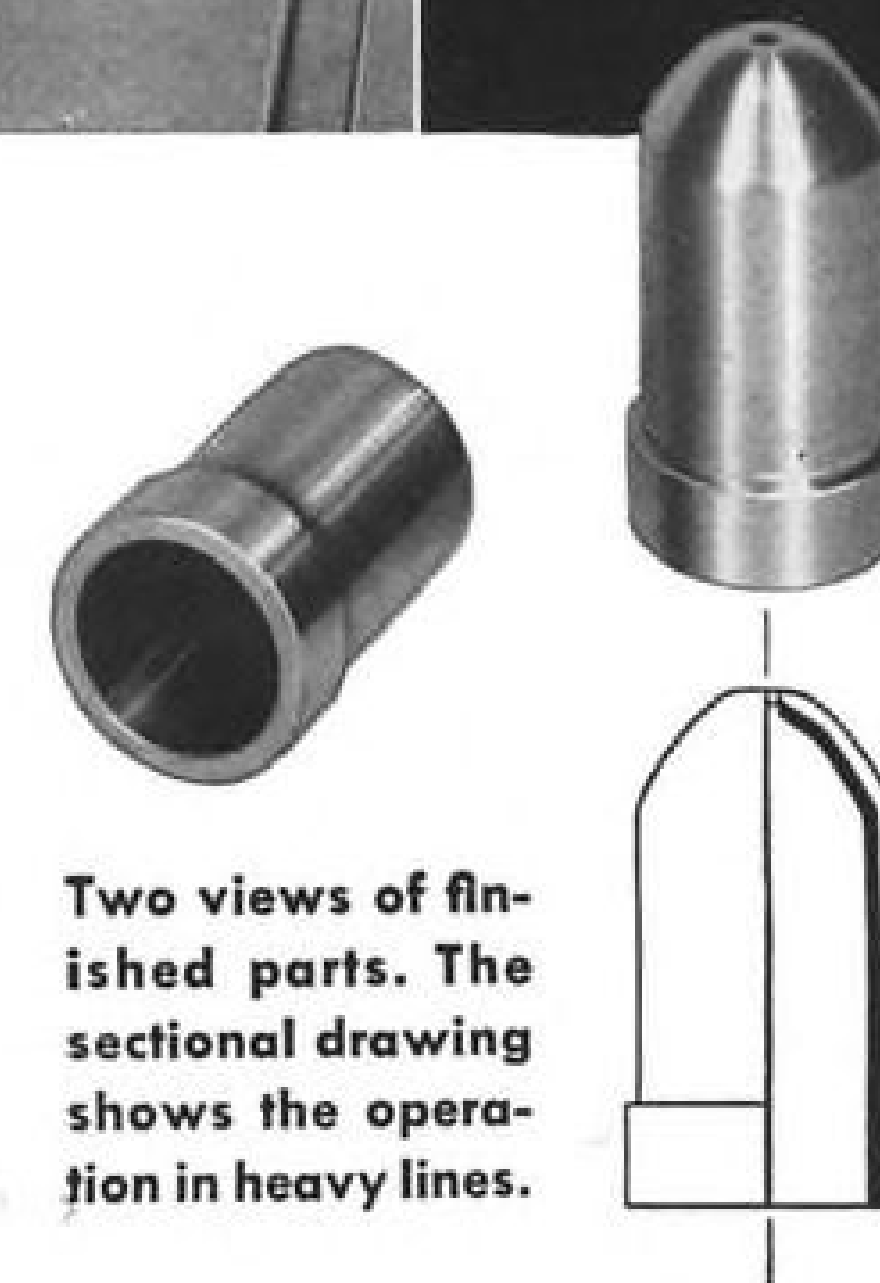
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Two views of finished parts. The sectional drawing shows the operation in heavy lines.

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ers have been designed to process aluminum alloy parts simply because of the heavy demand for aircraft components in that metal.

A press for extruding steel can always be used for aluminum alloy, but the aluminum processing unit cannot be used for extruding steel without modification. This is because the extruder for aluminum is a relatively slow-speed unit, whereas for processing steel the action is fast to minimize the high heat transfer from the steel billet to the steel die.

New Al-Fin Licenses

Manufacturing rights for the Al-Fin process have been licensed to four additional firms by Fairchild Engine & Airplane Corp.'s Al-Fin division. This brings to 18 the total of licensees.

The new licensees for the process of joining aluminum and its alloys to steel, cast iron, nickel or titanium are Thompson Products, Inc., Cleveland, Ohio, and St. Catherine's, Ontario; National Steel and Shipbuilding Corp., San Diego; Etablissements J. Floquet, France; and W. & W. Schenk, Germany.

USAF CONTRACTS

Following is a list of USAF contracts recently announced by Air Materiel Command:

Aviation Engineering Corp., 34-56 58 St., Woodside, L. I., N. Y., amplifier, single channel, 453 ea., \$59,540.

Bell & Howell Co., 7100 McCormack Rd., Chicago, gun cameras, 3,208 ea., \$500,000.

Best Fertilizers Co., 1459 Third St., Oakland, fertilizer, 580 ton, \$32,807.

Bradley, Milton, Co., 74 Park St., Springfield, Mass., trimmer, 1,486 ea., \$35,015.

California-Spray Chemical Co., Richmond, Calif., ester base, herbicide, 23,922 gal., \$69,852.

Canadian Commercial Corp., Box 4897, Cleveland Park Station, Washington, D. C., hinge pulse detector, 30 ea., \$27,145.

Cherry Rivet Co., div. of Townsend Co., 231 Winston St., Los Angeles, rivets, \$30,-276.

Cleveland Pneumatic Tool Co., 3781 E. 77 St., Cleveland, C-124 main gear piston, \$113,200.

Columbus Production Mfg. Co., 935 W. Goodale Blvd., Columbus, O., release assembly, 49,000 ea., lead assembly, 115,400 ea., vertebrae and tip assembly, 49,000 ea., \$841,634.

Consolidated Vultee Aircraft Corp., Ft. Worth, MTUs, \$400,000; B-36H aircraft, 83 ea., \$20,000,000.

Delta Chemicals, Inc., 801 No. "B" Street, Sacramento, Calif., calcium sulphate (dehydrating), 40,000 lb., \$47,600.

DeVry Corp., 1111 Armitage Ave., Chicago, projector sets, 793 ea., \$701,241.

Dial Screw Products Co., Inc., 32-21 58 St., Woodside, L. I., N. Y., rivets, \$75,521.

Drybak Corp., 67 Frederic St., Binghamton, N. Y., fur strips, 25,000 ea., \$55,375.

Eastman Kodak Co., 343 State St., Rochester, N. Y., photographic chemicals, \$69,-220; photographic paper, film, \$2,580,002.

Essex Wire Corp., 1601 Wall St., Ft. Wayne, Ind., electric insulated wire, 52,000 lb., \$30,318.

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Why Boeing has undertaken "Project X"

IN A restricted area of one of its Seattle plants, the Boeing Airplane Company is building a new prototype airplane which may be identified for the present as "Project X."

It will be a large, new type, jet-powered airplane incorporating many engineering advancements Boeing has developed and proved over the past several years. It will be a demonstrator model, the basic design of which will be adaptable to two production models:

1. A versatile military airplane for aerial refueling of fast jet bombers and fighters, and for cargo and troop transportation fitted to the tempo of jet-age military tactics.
2. A high-speed, economically operating airline transport for passengers and cargo.

Boeing has undertaken this program because it has long recognized a real need in America for modern, jet-powered equipment in each of these categories. The project has been underway for a substantial period of time. With the prototype Boeing will be able to demonstrate the capabilities of production aircraft in both the military and commercial fields.

The undertaking follows naturally from the company's leadership in the application of jet power to large aircraft. Designing, building and flying the B-47 Stratojet bomber and the new B-52 eight-jet Stratofortress have given Boeing a background of experience unparalleled elsewhere in the world. It has included, for example, 14,500 hours of jet wind tunnel research and more than 5000 hours of test and research flying. The Boeing Company is taking positive steps to apply this wealth of experience to advancement in the field of air transportation.

The prototype airplane — company financed — will be completed and flying in 1954. The project is being carried out with great enthusiasm, bred of highly successful experience with the B-47 and B-52 jet bombers. This will be another great Boeing.

BOEING

Federal Motor Truck Co., 5780 Federal St., Detroit, Coleman tow tractor, \$34 ea., \$16,494,012.

Federal Telecommunications Laboratories, Inc., 500 Washington Ave., Nutley, N. J., modification kits, 53 ea., \$28,704.

General Aniline & Film Corp., Ansco division, Binghamton, N. Y., photographic film & paper, \$727,828.

General Electric Co., Construction Materials div., 1285 Boston Ave., Bridgeport, Conn., cable, 43,000 ft., \$29,832.

Goodrich Co., B. F., 803-4 Winters Bank Bldg., Dayton, wheel assembly, 4,000 ea., nose wheel assembly, 1,000 ea., \$2,528,676.

Grant Photo Products, Inc., 18915 Detroit Ave., Lakewood, Ohio, photographic paper, \$625,002.

Haloid Co., 2-20 Haloid St., Rochester, N. Y., photographic paper, \$1,295,172.

Hoffman Laboratories, Inc., 3761 South Hill St., Los Angeles, radar direction finding assembly, 800 ea., \$1,851,512.

Jack, Bill, Scientific Instrument Co., Solana Beach, Calif., S-11 cameras, 70 ea., \$471,902.

Jack & Heintz, Inc., Cleveland, phase inverters, 1,814 ea., \$813,033.

Ledjay Manufacturing Co., 2908 Emerson Ave. South, Minneapolis, generators, 650 ea., \$73,283.

Lockheed Aircraft Corp., Burbank, Calif., kits, 22 ea., 122 ea., 28 ea., \$27,126.

Maxson Corp., W. L., 460 W. 34 St., New York, radar transmitter, 429 ea., \$51,006.

Octagon Process, Inc., 15 Bank St., Staten Island, N. Y., fertilizer, 615 ton, \$29,274.

Paranite Wire & Cable div., Essex Corp., 1601 Wall St., Fort Wayne, Ind., copper wire, various ft., \$32,699.

Perfection TV Mfg. Co., 4762 Third Ave., New York, crystal blanks, 58,000 ea., \$414,745.

Plastoid Corp., 42-61 24 St., Long Island City, N. Y., aircraft electrical cable, misc., \$140,468.

Power Equipment Co., 55 Antoinette, Detroit, rectifiers, 72 ea., \$33,627.

Price Electric Corp., Frederick, Md., contactor, 1,339 ea., \$204,266.

Raytheon Manufacturing Co., Waltham, Mass., radar sets, 810 ea., \$5,544,000.

Revere Electric Mfg. Co., Chicago, filter assembly green, 12,300 ea., filter assembly 43d, 2,000 ea., runway marker light C-1, 21,070 ea., \$285,447, top-assembly, 1,260 ea., \$33,831.

Robertson Co., R. R., 3067-79 N. Elson Ave., Chicago, camera, 8 ea., \$52,000.

Royal Electric, Inc., Jamestown, Ohio, 2,500-vol. inverters, \$28,055.

Royal Heaters, Inc., Alhambra, Calif., 450-gal. fuel tank, 36,984 ea., \$11,564,896.

Schaffer Air Industries, 37-15 11 St., Long Island City, N. Y., compass tester, 849 ea., \$135,684.

Schrader's Son div., A., Scovill Mfg. Co., 470 Vanderbilt Ave., Brooklyn 17, N. Y., valve, 15,386 ea., valve assembly-oxygen style C (low pressure), 368 ea., 17,196 ea., adapter & core, 8,306 ea., 14,048 ea., \$91,415.

Schwien Engineering Co., Van Nuys, Calif., spare parts, lot, \$166,144.

Scintilla Magneto div., Bendix Aviation Corp., Sidney, N. Y., engine analyzer & components kits, \$2,133,583.

Seeger Refrigerator Co., 850 Arcade St., St. Paul, 120-gal. fuel tank, 20,000 ea., \$6,280,000.

Selby Shoe Co., Portsmouth, Ohio, helmets, type P-1B, 26,437 ea., \$647,045.

Singer Sewing Machine Co., Singer Bldg., 149 Broadway, New York, sewing machines, 3,000 ea., \$1,242,108.

Singleton Co., Inc., Wm. H., Arlington, Va., prefabricated plumbing, 56 ea., \$304,108.

Sorenson & Co., Stamford, Conn., power units, D-2, A-4, 500 ea., \$409,041.

Southline Metal Products Co., 2115 Sabine St., Houston 10, steel drums, 92,000 ea., gaskets, 500,000 ea., \$631,815.

Sperry Gyroscope Co., Great Neck, L. I., N. Y., special tools for A-1B computer, \$213,880; type C-2 transmitter, S-3A control, V-9 indicator, \$26,215.

Stamford Electronics Co., 69 Southfield Ave., Stamford, Conn., pulse generator set, AN/UPM-15, 681 ea., \$418,284; signal generator TS-413C/U, spare parts & data, 993 ea., \$359,643.

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Starco Chemical Co., 4003 Navigation Blvd., Houston, remover, paint, 299,505 gal., \$422,052.

Steel Products Engr. Co., Springfield, Ohio, type C-9 bomb hoist, spare parts, 1,357 ea., \$2,301,585.

Steplight Products Co., 215-217 Forrest Ave., N. E., Atlanta, ladder, 325 ea., \$41,769.

Stewart-Warner Corp., South Wind div., 1514 Drover St., Indianapolis 7, exchanger, heater assembly, switch and data, \$425,851; spare parts for CF55AF, tow tractor, \$68,432.

Stone & Smith Inc., 5965 Alcoa Ave., Los Angeles 58, test oscillator & spares, \$133,303.

Stratford Pen Corp., 44 W. 28 St., New York, interphone control panels AIC-3, \$112,884; control panels C-404A/A, C-118 & C-701/AIC, \$102,444; control panels, \$102,444.

Stromberg-Carlson Co., 100 Carlson Rd., Rochester, N. Y., radio receiver R-11A/ARC, type 12 with D-10A dynamotor unit, 1,305 ea., \$305,739.

Strong Electric Corp., 87 City Park Ave., Toledo, light photographic arc, spare parts, data, 168 ea., \$96,506.

Sundstrand Machine Tool Co., Rockford, Ill., alternator drives, 615 ea., \$1,291,996.

Sun Electric Co., 6323 Avondale Ave., Chicago, A-3 generator test stand, 299 ea., \$963,378.

Sun Ray Photo Co., Inc., 304 Lafayette St., New York, lamp equipment, 775 ea., \$83,237.

Superior Sleeprite Corp., 2320 S. Holsted St., Chicago 8, desks, flat top 45" long, 1,928 ea., \$126,187; desks, flat top 45" long, 5,095 ea., desks, flat top 60" long, 1,248 ea., desk typewriter 45" long, 7,423 ea., \$1,055,381.

Sutton Corp., Q. A., 1812 W. Second St., Wichita, fuel tanks, 230-gal., 10,630 ea., \$1,867,718; rework 165-gal. tank into 230-gal. tank, 4,300 ea., \$670,972.

Switlik Parachute Co., Inc., 1325 E. State St., Trenton, N. J., band-parachute pack, 555,925 ea., \$241,607.

Sylvania Electric Product, Inc., 254 Rano St., Buffalo, N. Y., tuning unit RF Colonial 55608-1 AN/ARC-3, tuning unit RF Colonial dwg. 55023-1 AN/ARC-3, tuning R. F. osc. Colonial dwg. 55132, AN/ARC-3, tuning unit RF Colonial dwg. 55605-1, tuning unit RF Colonial dwg. 55606-1, \$294,634.

Taffet Radio & Television Co., 2530 Belmont Ave., Bronx, N. Y., control box, 1,164 ea., engineering data, 3 sets, \$70,872.

Taylor-Wharton Iron & Steel Co., 5038 Beech St., Cincinnati, helium cylinders, 10,000 ea., nitrogen cylinders, 4,000 ea., installation of valves, 14,000 ea., \$397,600.

Technical Appliance Corp., 1 Taco St., Sherburne, N. Y., antenna, 15,342 ea., \$145,166.

Technical Materiel Corp., P. O. Box 142, Mamaroneck, N. Y., receivers, 90 ea., \$223,215.

Technicraft Corp., 1701 Main Bldg., Kansas City, Mo., engine covers, aircraft, 600 ea., engineering data, 600 ea., \$65,844.

Telectro Industries Corp., 35-16 37th St., Long Island City, N. Y., tester gun, type G-3, 765 ea., \$617,873; tester assembly electric thermometer, 330 ea., \$106,326; items 1A, 1B, 1C, 1D, 1E, 1F, 1G & 1J recorder, spare parts & data, 382 ea., \$144,672; B-29 fire control lead checking device, 500 ea., \$41,950.

Telephonics Corp., Park Ave., Huntington, L. I., headsets H-46A/UR, \$149,950; headsets H-46A/UR, \$149,950; headset-microphone, 10,655 ea., \$185,929.

Thompson Products, Inc., 23555 Euclid Ave., Cleveland, valves & spare parts, \$35,703.

Titeflex, Inc., 500 Frelinghuysen Ave., Newark, N. J., harness assemblies & miscellaneous parts, \$161,586.

Trailermobile Inc., 31 & Robertson Sts., Cincinnati, airborne, air conditioned semi-trailers, 5 ea., \$100,063.

Transducer Corp., 1085 Commonwealth Ave., Boston, Mass., radar set, AN/ APQ-TI, \$462,714; spare parts for AN/APQ-13TIA, spare parts for AN/ APQ-T3, \$121,786.

Troy Machine Co., 91 N. Lotur Ave., Pasadena, Calif., bolts; nuts; pump; foot-leg; leg extension; pump, cylinder & leg assemblies, 12,260 ea., \$27,860.

Turk Mfg. Co., Joseph, Bradley, Ill., desk,



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flat top, 462 ea., desk typewriter, 462 ea., \$68,883.

Union Carbide & Carbon Corp., Linde Air Products Co. div., New York, liquid oxygen for use as a propellant, 100,573,770 cu. ft., \$306,750.

United Machine Co., 5700 E. Belknap, Ft. Worth, Tex., trailer, hose reel, type B-1, 16 ea., \$37,430.

United Mfg. Co., 3401 N. California Ave., Chicago 18, dynamotor test set, TS-414/U, 84 ea., \$33,267.

U. S. Display Corp., 2619 Colerain Ave., Cincinnati 14, tow target, 25,000 ea., \$519,780.

U. S. Gauge div., American Machine & Metals Inc., Sellersville, Pa., transmitter, multi-purpose, 14,345 ea., \$1,526,538; transmitter, oil pressure, 2,411 ea., \$251,731; transmitter, pressure torque, \$323,158; transmitter, hydraulic pressure, 12,054 ea., \$1,389,716; fuel transmitter, 2,293 ea., \$248,956; transmitter, 1,978 ea., \$259,452.

U. S. Pipe & Mfg. Co., Box 69 E. Grand Ave., S. San Francisco, elbows, tee & gasket, 6 items, \$51,381.

Univeral Mfg. Co., 29-51 E. 6 St., Paterson 4, N. J., transformer & data, 6,160 ea., \$193,562.

Universal Scientific Co., Inc., 1102 Shelby St., Vincennes, Ind., trainer-demonstrator type Q161, 74 ea., trainer-demonstrator type Q160, 65 ea., \$71,478.

Universal Steel Equip. Corp., 32-33 47 St., L.I.C., N. Y., revolving bins, steel, 144 compt., 970 ea., \$80,801.

Van Norman Co., Springfield, Mass., crankshaft re-grinder, 7 ea., \$120,893.

Vendo Co., 7400 E. 12 St., Kansas City, Mo., indicator ID-169B/APN-12, 1,205 ea., \$453,474; dummy loads TS 90A/AP, 720 ea., \$72,481.

Vickers, Inc., 1402 Ackman Blvd., Detroit, spare parts, brake valve parts, \$28,460.

Victoreen Instrument Co., 3800 Perkins Ave., Cleveland, survey meters, spare parts & data, 196 ea., \$50,240.

Victoreen Instrument Co., 5806 Hough Ave., Cleveland, capacitors, switches, terminal boards & miscellaneous spare parts, 1 lot ea., \$63,443.

WAC Engineering Co., 35 S. St. Clair St., Dayton, dummy load, 793 ea., case, 793 ea., data, \$49,463.

Waco Aircraft Co., Troy, Ohio, type K-7 bomb cradle, 506 ea., \$119,173.

Wasley Products, Inc., Plainville, Conn., ripcord assembly, 2,348 ea., ripcord-parachute-back & chest, 16,109 ea., \$31,916.

Waukesha Motors Co., Waukesha, Wis., spare parts, \$29,113; \$38,527.

Weaver Mfg. Co., Springfield, Ill., lift, 60 ea., 40 ea., \$106,137.

Weber Aircraft Corp., 2820 Ontario St., Burbank, Calif., spare parts for maintenance platforms, \$35,486.

Webster-Chicago Corp., 5610 Bloomingdale Ave., Chicago, AN/ARA-26 keyer controlling group, 6,031 ea., \$748,453; AN/FPN-13 radar beacon, 40 ea., \$2,469,760.

Welded Construction Engineering Co., Cleveland, F-2 trailer, spare parts & data, 1,594 ea., \$500,992; trailer, aircraft engine or propeller, type C1C & spare parts, 596 ea., \$620,320.

Wells-Gardner & Co., 2701 N. Kildare Ave., Chicago, radio modulator & transmitter BC-925-A, 232 ea., \$200,907.

Western Design & Mfg. Co., 220 N. Front St., Burbank, Calif., blower assembly, camera window defroster, \$44,149.

Western Electric Co., 120 Broadway, New York, resistor assemblies, 44 ea. of item 1, resistor assemblies, 56 ea. of item 2, resistor assemblies, 90 ea. of item 3, resistor assemblies, 114 ea. of item 4, resistor assemblies, 50 ea. of item 5, resistor assemblies, 86 ea. of item 6, resistor assemblies, 84 ea. of item 7, resistor assemblies, 86 ea. of item 8, resistor assemblies, 50 ea. of item 9, resistor assemblies, 72 ea. of item 10, \$134,953; transformer D-169271, 150 ea., \$42,000.

Westinghouse Electric Co., 32 N. Main St., Dayton, 40-kva. alternators, L-1 voltage regulators, 253 ea., 246 ea., \$235,358; 300-amp. generators, 4,166 ea., \$1,793,195; 400-amp. generators, \$65,835; generators, AC-C-7, 80 ea., \$114,931; generators, 666 ea., \$240,192.

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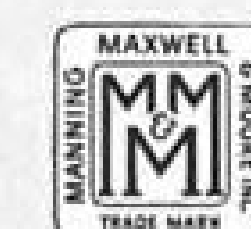
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EQUIPMENT



First Report on Comet Hydraulics

BOAC engineer describes jet transport's systems, says carrier has had only minor problems.

By George L. Christian

British hydraulic experts apparently do not wholly share American concern over too-complicated systems and mechanisms in aircraft, at least in the transport field. That is the impression one gets from a paper on the hydraulic system of the de Havilland Comet, recently presented at the Vickers, Inc. Transport Aircraft Hydraulic Conference by Sydney Oldfield, chief technical officer of the Chief Development Engineer's Branch, British Overseas Airways Corp.

However, a de Havilland representative in this country depreciates the American stand on complexity. "When your transports fly as fast as the Comet, your hydraulics will be complicated too," he said.

The Comet has six hydraulic systems and no less than 13 accumulators, Oldfield points out. However, four of the power systems conform to Lockheed practice (Lockheed Hydraulic Brake Co., London), and all components, except the servodynes, "show no marked departure from previously well-tried design, this being a definite operational and maintenance advantage," Oldfield states.

► **Little Trouble**—BOAC says the carrier had experienced little trouble with the Comet's hydraulic system as of the end of August, when seven Comets had built up a total of 3,800 flying hours.

The company has had leakage and what it felt were excessive seepage problems. But modifications using appropriate seals and fits of the affected components are gradually eliminating this problem.

The equipment bay contains so much piping and so many hydraulic compo-

nents, that air became saturated with hydraulic fluid during ground running. This caused autopilot rubber shock mounts to deteriorate and paint to peel. Improved venting of the compartment proved to be the answer to this one.

Flap servodyne operating valves tended to stick; this was corrected by increasing the mechanical advantage from the cockpit control.

One or two engine-driven pumps have failed to date, but BOAC does not regard the failures as serious enough to warrant modification.

► **Six Systems**—Oldfield described the Comet's six hydraulic systems:

• **Main system** operates landing gear, steering, wheel and air (aerodynamic) brakes, flaps and flying control secondary servo units. Fluid comes from reservoir in the equipment bay.

Power comes from two pumps, one on each outboard engine. On-off cocks in the line adjacent to each pump are operated by engine low pressure fuel cock controls.

In each pressure line from the pumps are a filter and flow indicator. Fluid passes through a double check valve and joins in a common line coupled to a cut-out valve. From there it goes to the accumulators (all carry an initial air charge of 900-950 psi.), selector valves and control units of the various systems.

The main system can power secondary flight control system if primary servo control system fails.

• **Servo control system** operates the "flying control primary servo units. It is a self-contained system and cannot be introduced into any other system, or vice versa." It has on-off cocks, filter flow indicators and cut-out valve just as the main system does. It also incorporates a pressure switch which operates a warning light and horn in the cockpit when pressure is low.

Fluid is contained in the system's reservoir in the equipment bay. Power comes from two pumps, one on each inboard engine. Check valves are installed on the pump suction lines.

On the pressure side, fluid is routed from cut-out valves to two accumulators, with a second line feeding the primary servo units. Two other accumulators are coupled to the aileron and elevator servos, with a maximum charged pressure just below that of cut-in pressure, to give a slightly extended period of power supply, should there be a failure of the servo control system.

This is to give time for power change-over levers to be operated.

The supply lines from the servo control system are coupled to the aile-

De Havilland Comet I

Approved Hydraulic System Component Life

Aileron, rudder and elevator servodynes	600 hr.	Flow indicators and wind-shield wipers	1,000 hr.
Cut-out valves (pressure regulators)	600 hr.	Selector valves	1,000 & 2,000 hr.
Pumps	1,000 hr.	Pressure relief, ground test, and sequence valves	2,000 hr.
Wing flap servodyne	1,000 hr.	Landing gear door servodyne and thermal relief valves ..	2,000 hr.
Steering and air (aerodynamic) brake actuating cylinders	1,000 hr.	Brake control unit	2,000 hr.
Main and nose landing gear actuating cylinders	1,000 hr.	Check valves	2,000 & 4,000 hr.
Accumulators	1,000 hr.	Reservoirs and hand pump ..	4,000 hr.
		Off-loading valve	4,000 hr.

All components are made by Lockheed Hydraulic Brake Co., London, with these exceptions: Brake control unit, by Dunlop; reservoirs, by de Havilland.

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*Manufacturing capacity is now available for a great many models of these products.

ron and elevator primary servo unit valve housing with check valves to prevent feedback between the supply lines. Pressure in the backing accumulators can be released only by the use of the aileron and elevator controls, whereas pressure in the supply accumulator is released by means of the ground test and pressure release valve.

• **Emergency servo control system** supplies hydraulic power to the flying control secondary servo units in the event of failure of both regular servo control and main hydraulic systems. It may also be used to ground test flight controls when engines are not running and no pressure exists in the servo control and main systems.

The emergency servo system is connected to the main system on the servo

unit valve housings, where fluid flows into a common line. Check valves prevent fluid feedback.

Pressure comes from an electrically powered pump. Fluid circulates through the usual flow indicator and cut-out valve to the valve housing of each secondary servo unit. A change-over valve is installed in the supply line. And a flow indicator Microswitch flicks on a warning light installed next to the pump motor operating switch on the control cabin ceiling. Pressure switches operate warning lights placed next to those of the servo control system. The complete system is contained in the equipment bay.

• **Standby system** is designed to permit emergency extension (through independent lines) of landing gear and

operation of flaps, brakes and steering in case of main system failure. It also operates the entire hydraulic system except the primary servo units for ground test.

An electrically driven pump pushes the fluid through a flow indicator and cut-out valve to two accumulators. A check valve between the accumulators assures availability of accumulator pressure for parking brakes, even though an upstream pressure relief valve has been opened. Accumulator pressure can be relieved only by several applications of the brakes.

• **Hand pump system's** sole purpose is to lower landing gear and operate wheel well doors.

Its pump is a twin unit, which is operated by one handle. Located on the flight deck, the system contains a pump handle-operated check valve which isolates the hand pump system from the standby system when the handle is released from its stowed position.

• **Windshield system** operates the wipers. Originally they were operated by a single hydraulic pump driven by a hydraulic motor deriving its power from the Comet's main hydraulic system.

Ground operation was satisfactory but air loads in flight prevented the wipers from working well. Arrangement was changed to include one electrically driven hydraulic motor per wiper. Each wiper drive is now self-contained and is entirely divorced from the main system.

Operation is reported to be "entirely satisfactory."

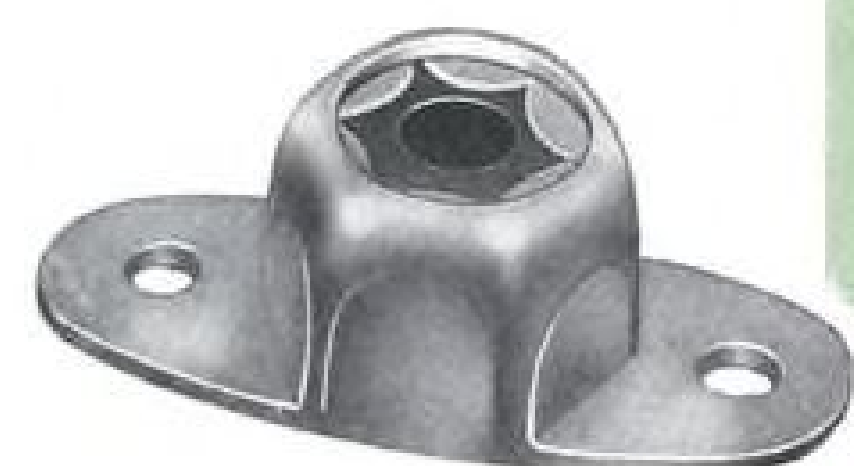
► **Servodynes**—Comet surface controls can be operated only hydraulically in flight. Surfaces are moved through hydraulic servo units connected to the usual set of pilot controls. These servodyne units are described as "fundamentally hydraulic jacks with integral valves." Four of the aircraft's six hydraulic systems can feed the servodynes.

The servo valves have a stroke of 0.125 inch in either direction. Being fixed to a movable cylinder, the servo valve housing follows any movement of a flying control. In the neutral position, a hydraulic lock exists in the valve. When the housing moves from neutral, the lock is broken. The cylinder moves on the piston rods in the direction of valve movement until it has "caught up" with the housing and returned the valve to neutral.

This method is said to give immediate response of the cylinder, proportional to the rate and range of valve movement (providing valve movement exceeds 0.125 inch).

► **Flight Surfaces**—Rudder and elevator primary servos are coupled through a servo valve to their respective surface controls. Primary and secondary servos

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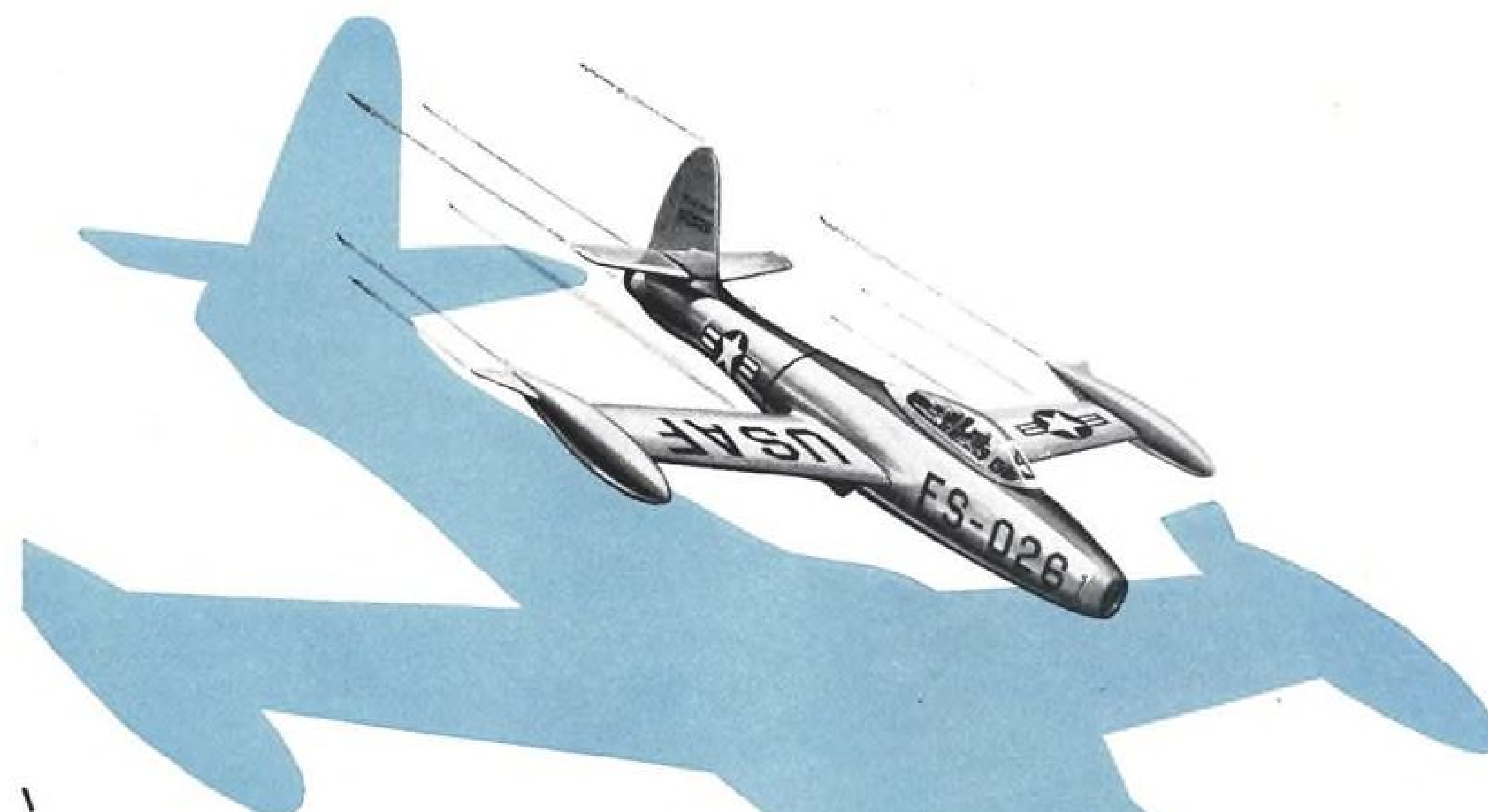
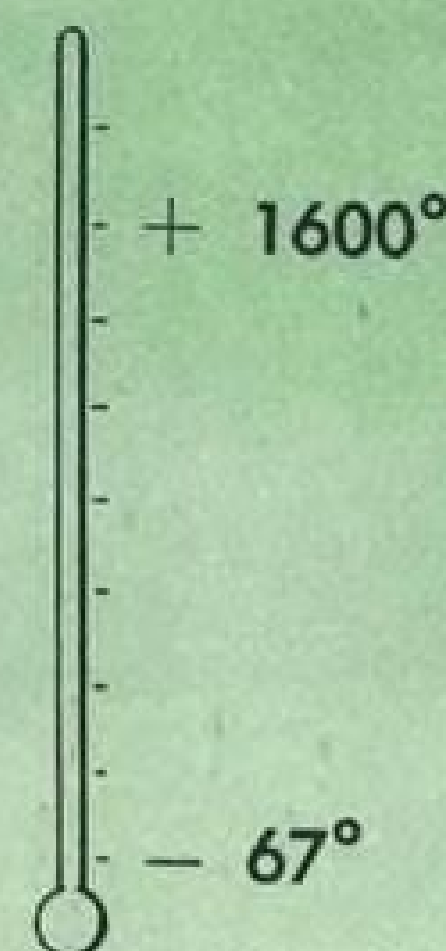
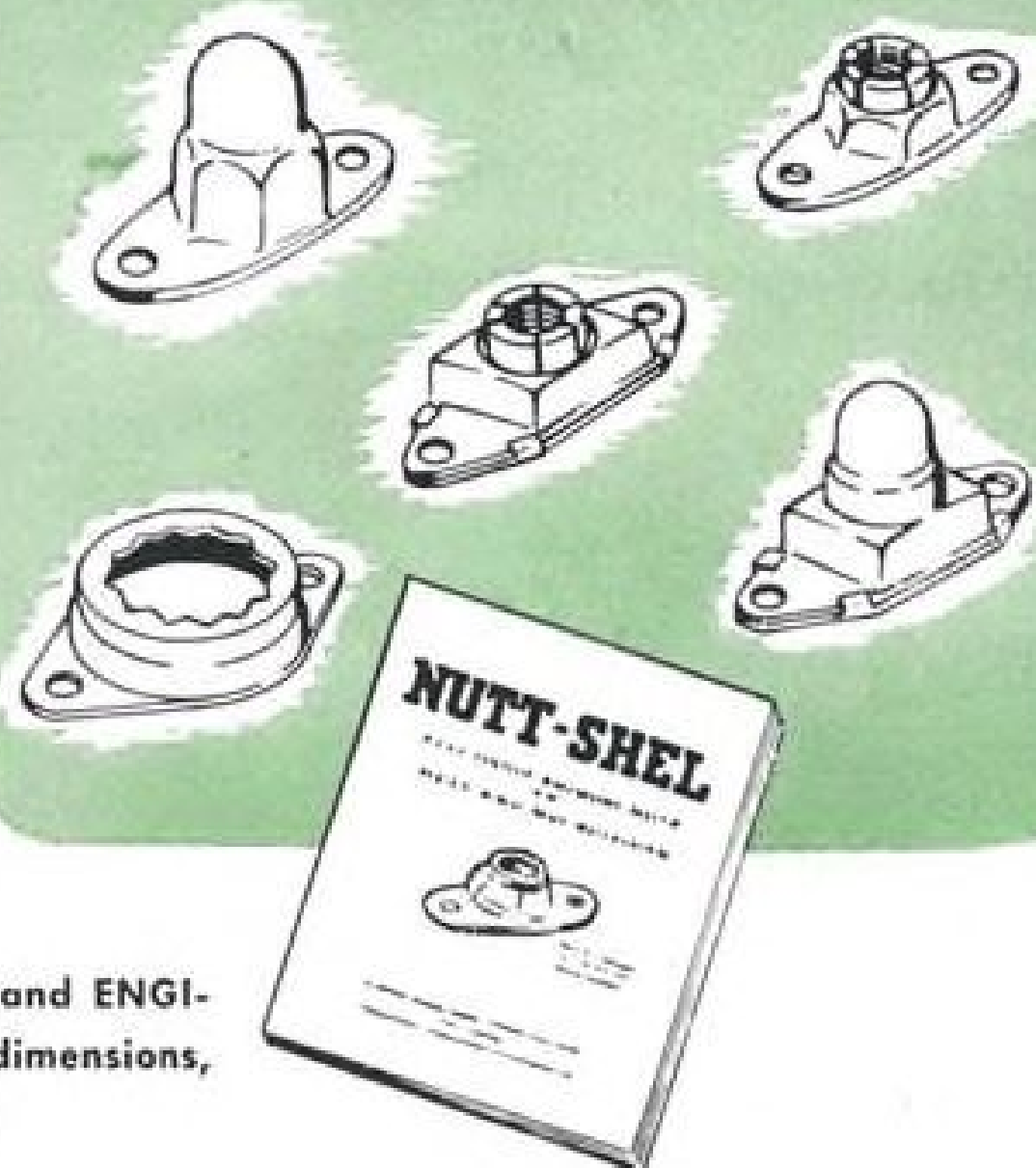
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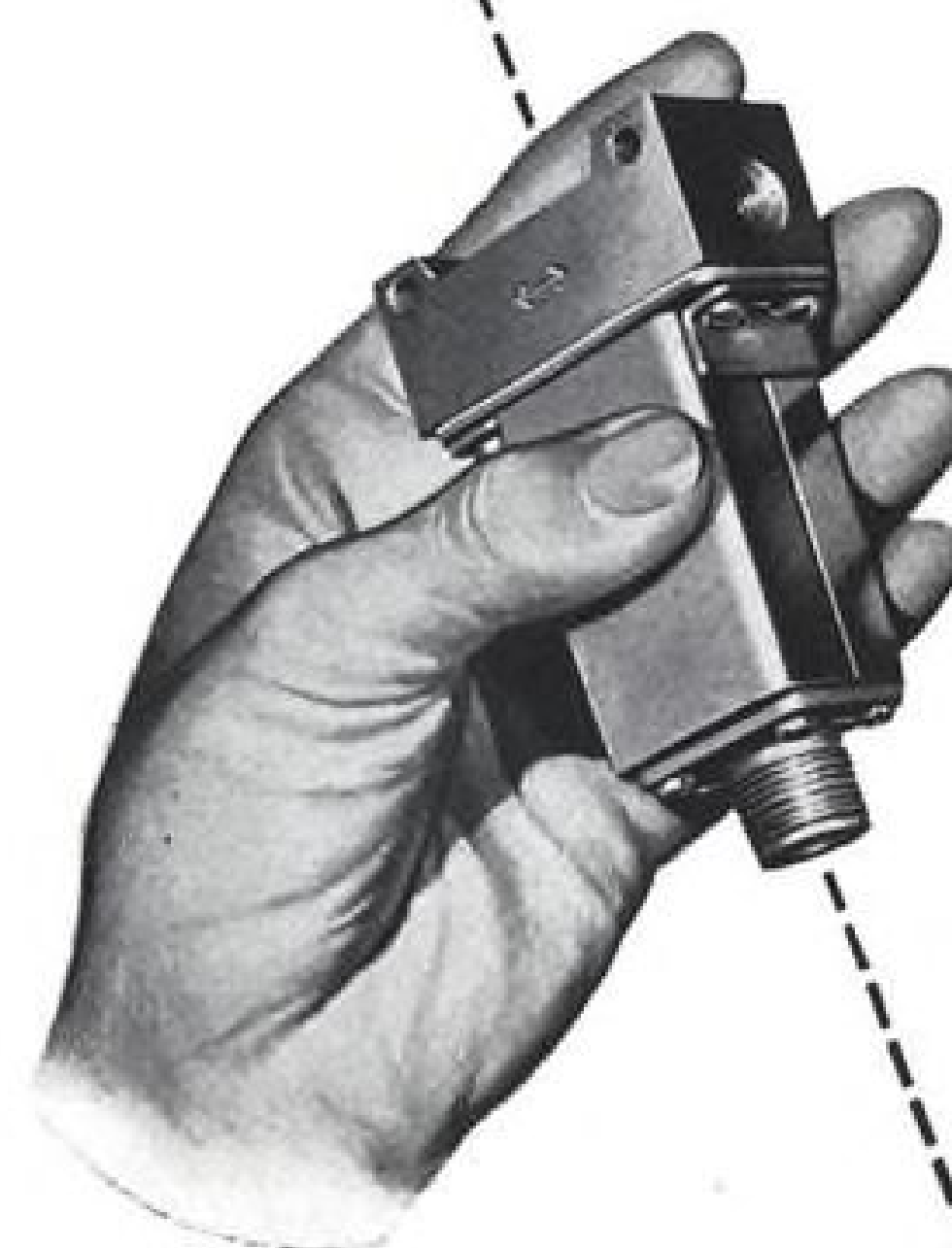
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are mechanically linked.

In the aileron system, servo valves are directly operated. Each servo control cylinder is connected by cables or push-pull rods to control surface operating jacks or levers. Primary units can be operated only by the servo control hydraulic system. Secondary units can be operated by the main and emergency servo control hydraulic systems in flight, and by the standby system on the ground.

For aileron control, the primary and secondary servos are separate but identical. For rudder and elevator, the primary and secondary units are arranged end to end inside a common body.

Aileron servodynes are located forward of center section rear main spar. They transmit movement through cables, running over pulleys to a screw jack, which operate the ailerons. Rudder and elevator servos are just forward of the rear pressure bulkhead. Their motion is transmitted through push-pull rods, torque tubes and levers.

► **Wing Flap Servodyne**—The wing flap servodyne is a much simpler component than the flight surface units because it does not have to be capable of such fine exactitude of control.

Pedestal control is mechanically linked to the selector valve extending or retracting the flaps as desired. Inboard flap operation is achieved through cables which operate push-pull rods. Outboard flaps are handled with screw jacks.

► **Landing Gear**—Main and nose gears are operated by single actuating cylinders. Main gear doors are servodyne-operated, nose gear doors are mechanically opened and closed. Restrictor valves are used in all landing gear "up" operating lines.

► **Steering**—Steering wheel, on the left of the cockpit, is mechanically connected to its selector valve whose movement gives progressive movement in the direction desired. Valve plunger is springloaded to its neutral position for self-centering.

Taxiing shock loads are damped through relief valves. One-way restrictors damp wheel shimmy. A cam on the retraction mechanism operates a sequence valve to make the nose gear steering mechanism inoperative until the gear is down and locked.

► **Wheel Brakes**—Bogie main gear is equipped with Dunlop wheels mounting hydraulic brakes. The standby pump motor is switched on during all ground maneuvers, takeoffs and landings, to make this system's pressure immediately available should there be a failure of the main system. Standby system accumulators are the only source of supply for parking.

Foot controls operate right and left brakes independently. A manual pedestal control applies equal pressure to all

brakes through their respective control valves. Pressure is proportional to the control movement up to a maximum of 1,500 psi.

► **Air Brakes**—Operation of aerodynamic brakes is conventional; no emergency operation is provided. Selector valve is in the equipment bay. A lock valve in the supply line creates a hydraulic lock when brakes are in the "off" position.

► **Accessibility**—A principal feature of the Comet's hydraulic system is accessibility. Many units can be reached in flight.

In the equipment bay, accessible through a hatch in the pantry floor, are the main, standby and servo control system reservoirs, eight accumulators, each with charging connection and pressure gauge; also the standby system pumps and hand pumps, various selector, pressure and thermal relief valves, the ground test valve, cut-out valves, pressure transmitters and the hand pump reservoir.

Five other accumulators are located under the cabin floor and may be reached in flight through a hatch in the cabin floor.

Rudder and elevator servodynes are accessible through inspection panels in the dressing room floor.

Not accessible during flight are the emergency servo control system reservoir, pump, motor and cut-out, aileron and flap servodynes and engine-driven pumps, according to BOAC.

► **General Notes**—All flexible tubing is made of natural rubber and solid lines are Tungum, British equivalent of Everdur.

Shock effects in the system are kept to a minimum by the 13 accumulators (piston type), which also helps to supply standby power in the case of power failure.

The equipment bay under the floor contains many components and a good part of the piping. They are in a pressurized section of the plane and are accessible in flight.

Fluid used is castor-base Lockheed 22.

De Havilland has color-coded the various hydraulic systems for convenience.

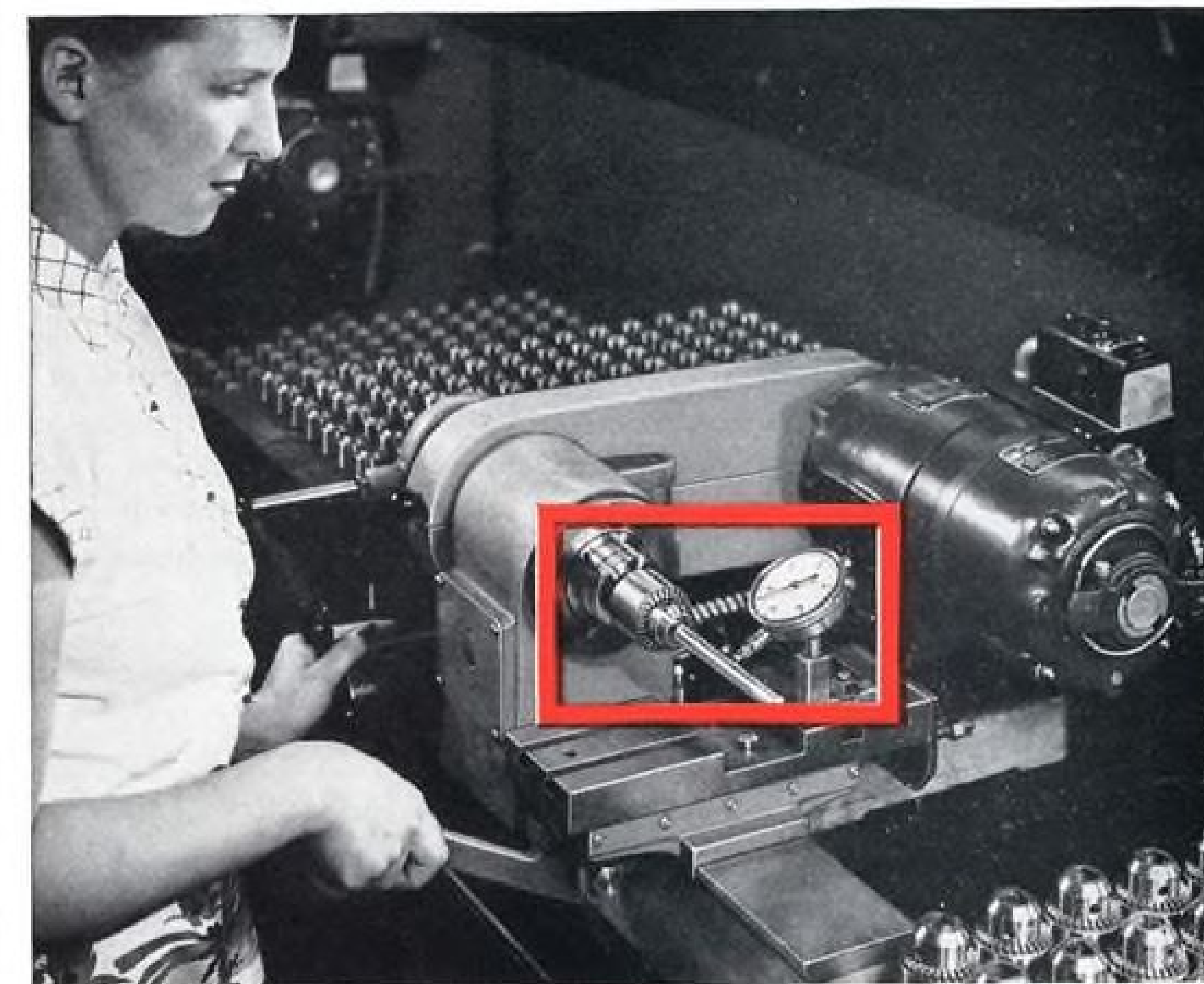
Main hydraulic is green; servo control is blue; emergency servo control is yellow; and standby is red.

PAA Engine Shop

A half-million-dollar engine shop to handle major overhauls for Pan American World Airways' entire Pacific-Alaska division fleet is to be set up at San Francisco Airport.

Scheduled to begin operations in a year, the new overhaul shop will handle work the carrier has been giving to outside contractors, including P&WA R4360s, R2800s and R2000s.

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A control designed to hold frequency of alternators constant to 0.001% on motor generator sets supplying up to 10 kw. of power has been announced by General Electric.

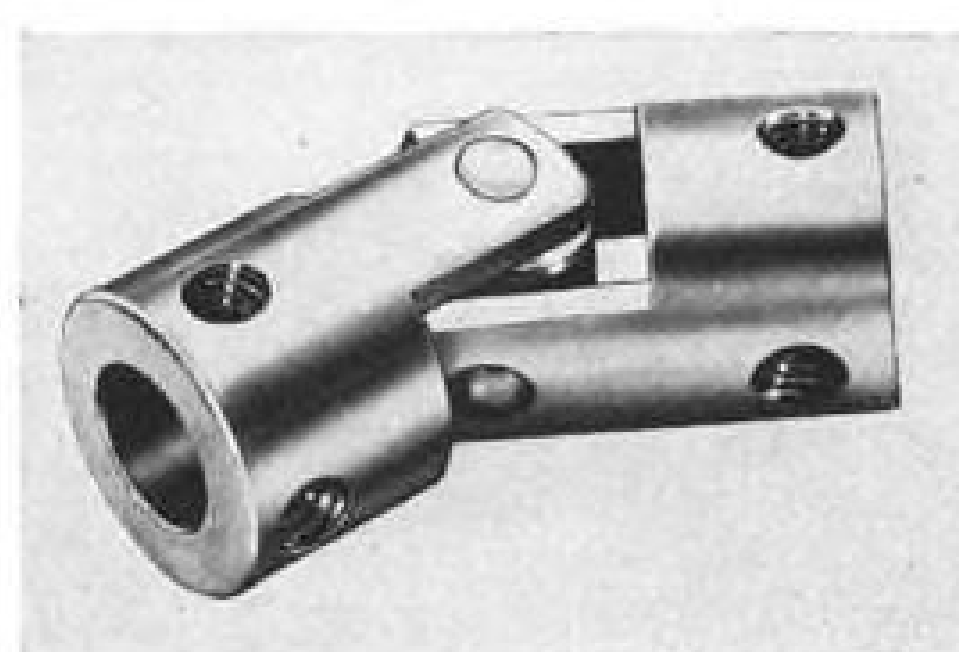
The equipment is available in 50-, 60-, and 400-cps. models in single- or three-phase. Non-standard frequencies are available on special order. It is intended primarily for laboratory and industrial applications, but it can be adapted for use with a constant-speed mechanical drive.

The control consists mainly of a tuning fork and phase comparator. The output of the alternator of the motor-generator set is held in synchronism with the tuning fork frequency standard by comparing the alternator phase with that of the tuning fork. As the alternator phase begins to lag, the current in the control winding on the main shunt field of the d.c. motor is increased. An anti-hunt circuit is used to improve stability.

The equipment can be used to prevent undesired hysteresis and eddy current effects in testing caused by frequency variation, or as a standby source of emergency power for automatic and synchronous equipment. It also can be used as a plant frequency standard.

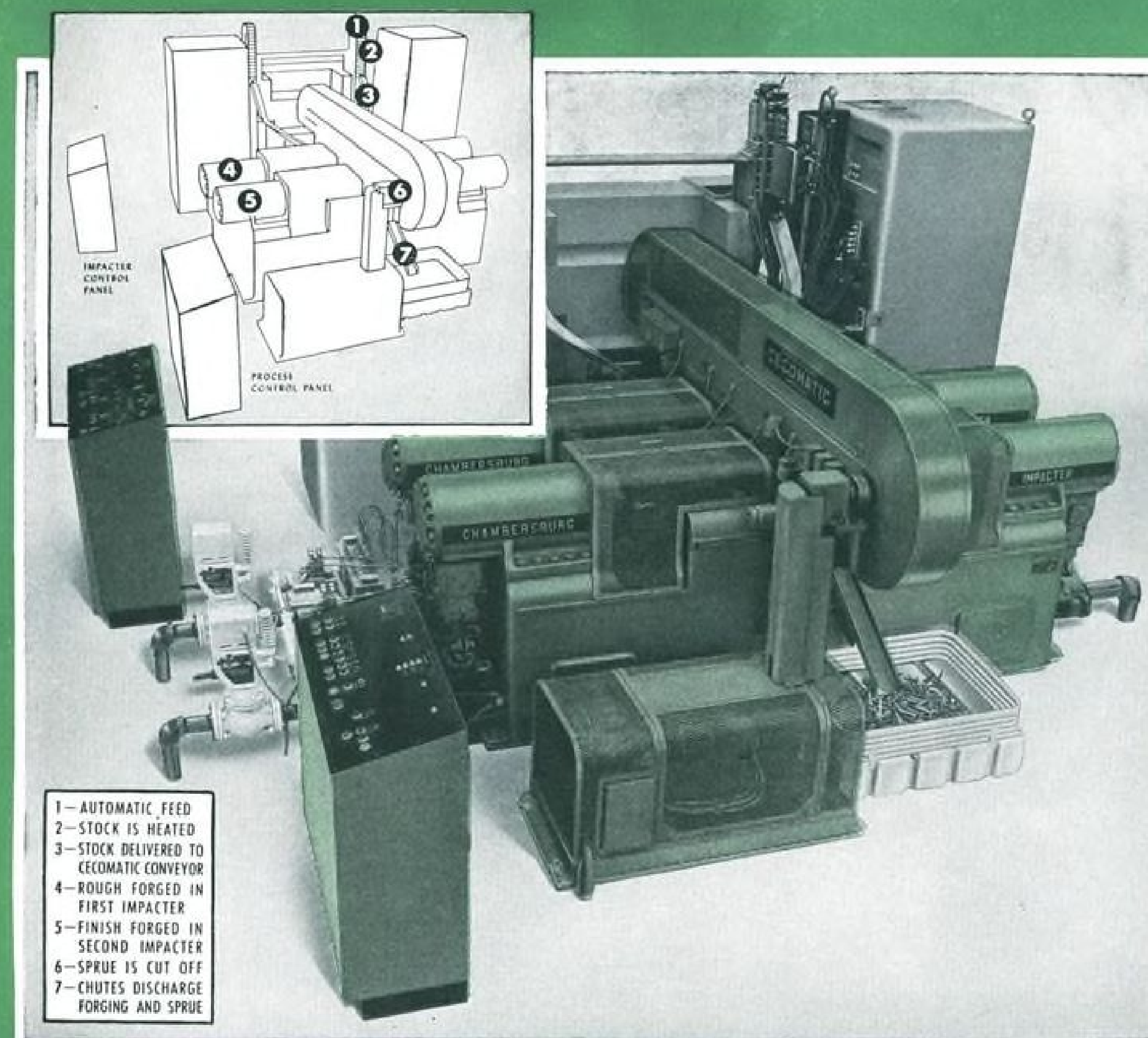
General Electric Co., Special Products Section, Schenectady, N. Y.

NEW AVIATION PRODUCTS



Universal Joint

A new universal joint developed mainly for instrumentation and remote-control applications where backlash must be kept to a minimum will assure absolute fidelity between input and output when used in phased pairs, according to the manufacturer. Selling for around a dollar, this precision-type joint employs 1/4-in.-diameter centerless-ground pivots and surface-ground center blocks of steel or type 303 stainless steel. Army Spec. 72-53 was met by nickel-plating the outer surfaces of the



A new method for the automatic mass production of "drop forgings" is announced by Chambersburg Engineering Company.

The method is called Impacting; the process (illustrated above) the Cecomatic Forging Process.

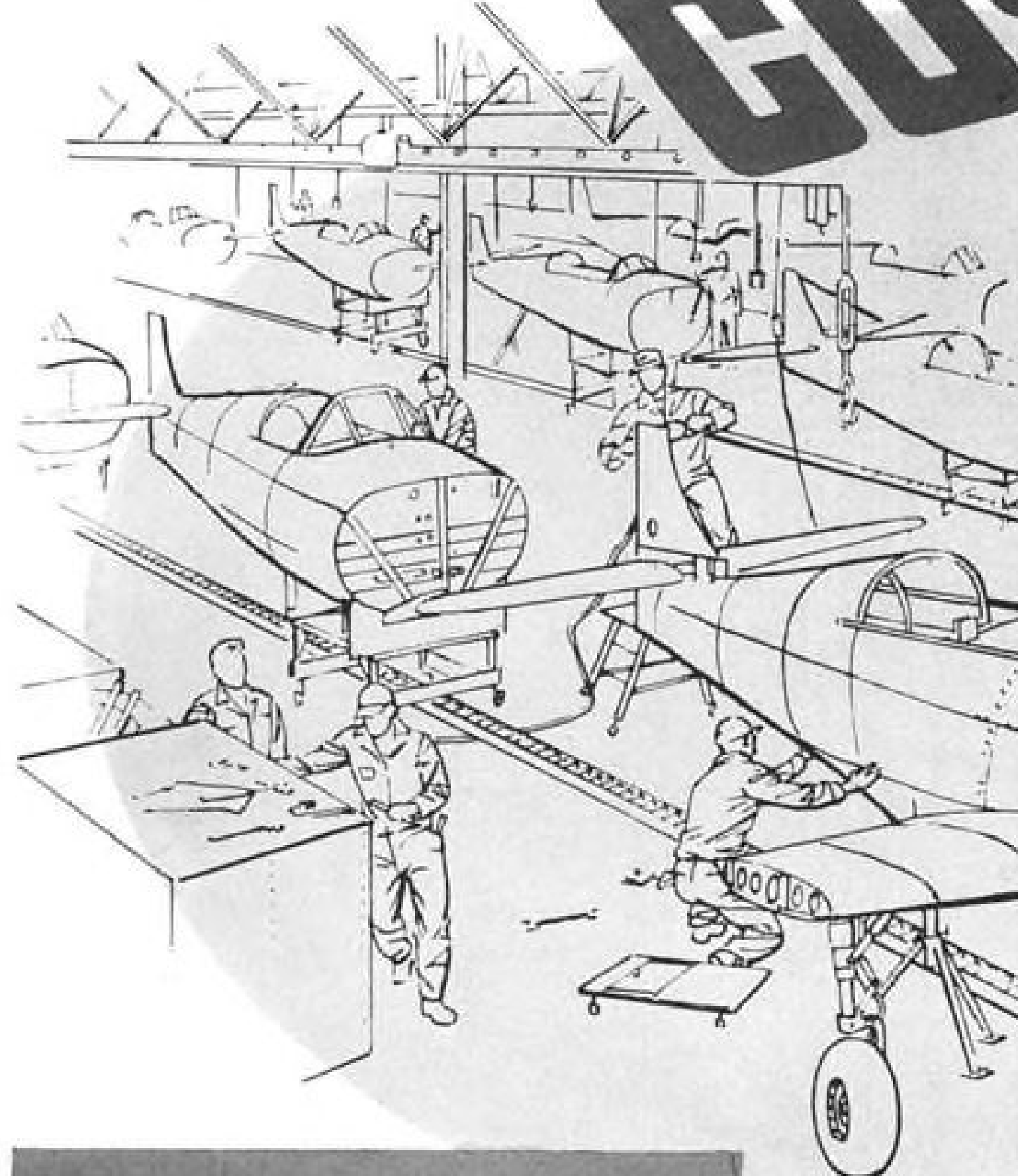
The Chambersburg Impacter, a new and unique type of hammer, is the basic tool of Cecomatic Forging.

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TWO WAYS!



TEMCO YT-35 BUCKAROO ARMED TRAINER

TEMCO has built its reputation as a low-cost airframe producer, and this fact has been largely responsible for the company's rapid rise in the aviation industry. But more than low-cost production is TEMCO's continuing effort to build into its designs not only lowest possible original cost but also low operation-maintenance cost.

Such two-fold, low-cost building is clearly evidenced in TEMCO's own YT-35 BUCKAROO Military Trainer. The all-metal, two-place tandem, low-wing monoplane can be delivered, fully-equipped, for even less than World War II trainers of comparable scope.

Its versatility as both a trainer and a ground support weapon (when equipped with two 30-caliber machine guns and ten 2.75-inch rockets) is characteristic of the design thinking that has helped TEMCO become one of the nation's leading prime aircraft contractors.



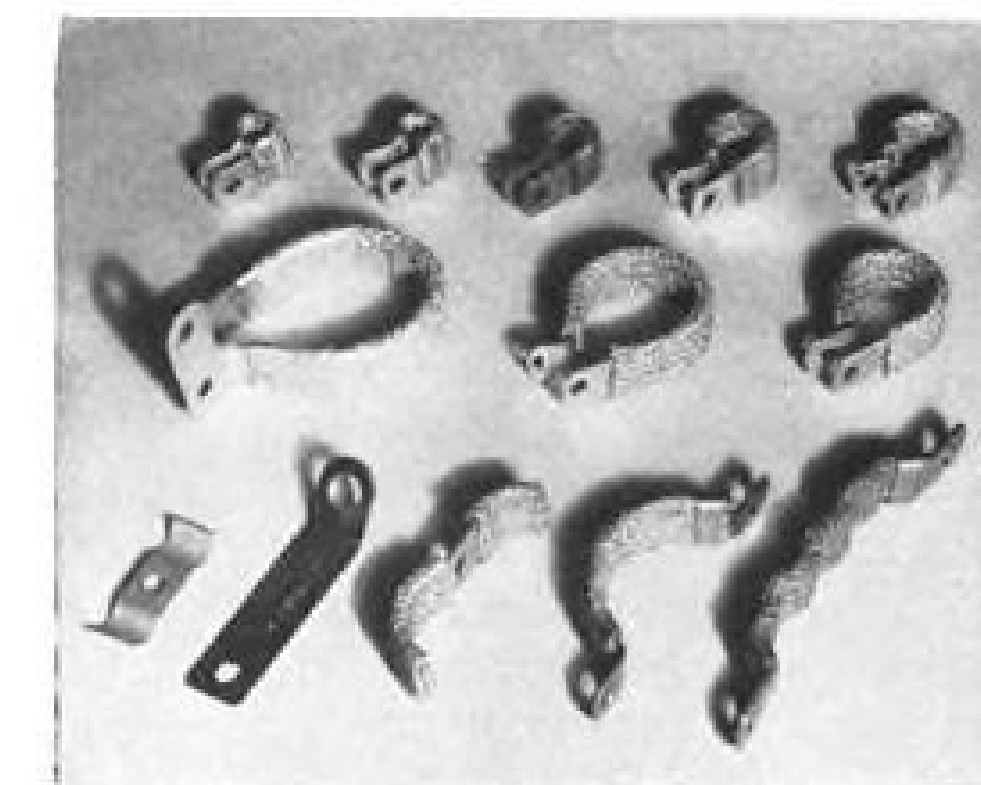
DALLAS, TEXAS

AIRCRAFT CORPORATION

brass forks, which have precision reamed holes.

One unit is 14-in. long, 4-in. in diameter with two 6-32 setscrew holes in each fork at 90 deg., and has sockets to receive 1-in.-diameter shaft or 3/8-in.-diameter shaft.

Patents are pending on an insulating-type joint, using molded nylon forks. Kupfrian Manufacturing Co., 381 State St., Binghamton, N. Y.



New Support Clamp

New, heat-resistant support clamps for use in jet engines, missiles, and aircraft will contribute to the control of vibration and elimination of resonance in flexible and rigid piping, according to the manufacturer.

The clamps, which are covered with a specially treated asbestos cushion, and fit snugly around pipes and hoses to prevent chafing, have been subjected to more than 18 months of testing on jet engines by the maker. They can be supplied in any number of sizes and shapes, in either AMS 6355 steel cadmium plated to AMS 2400, or in AMS 5540 stainless steel.

Avica Corp., Portsmouth, Newport, R. I.

Timing Motor

The synchronous characteristics of a new 400-cycle a.c. timing motor, developed for use in the guided missiles and aircraft industry, offer increased accuracy and dependability under the most adverse operating conditions, its manufacturer states.

Elimination of the need for conversion to d.c. timing systems, instantaneous starting and stopping, the accomplishment of effective reversing by use of a single-pole double-throw switch, are among the features claimed for the new timer. The motor operates on 115 v. $\pm 10\%$ with frequency of 400 cps. $\pm 20\%$. Torque is .025 oz.-in. at 3,000 rpm. starting and running. A power input of 6 watts operates the motor, including the phase shift network. Rotor speed is 3,000 rpm. at 4,000 cps. with output speeds available from 3,000 rpm. to 1 1/2 rph.

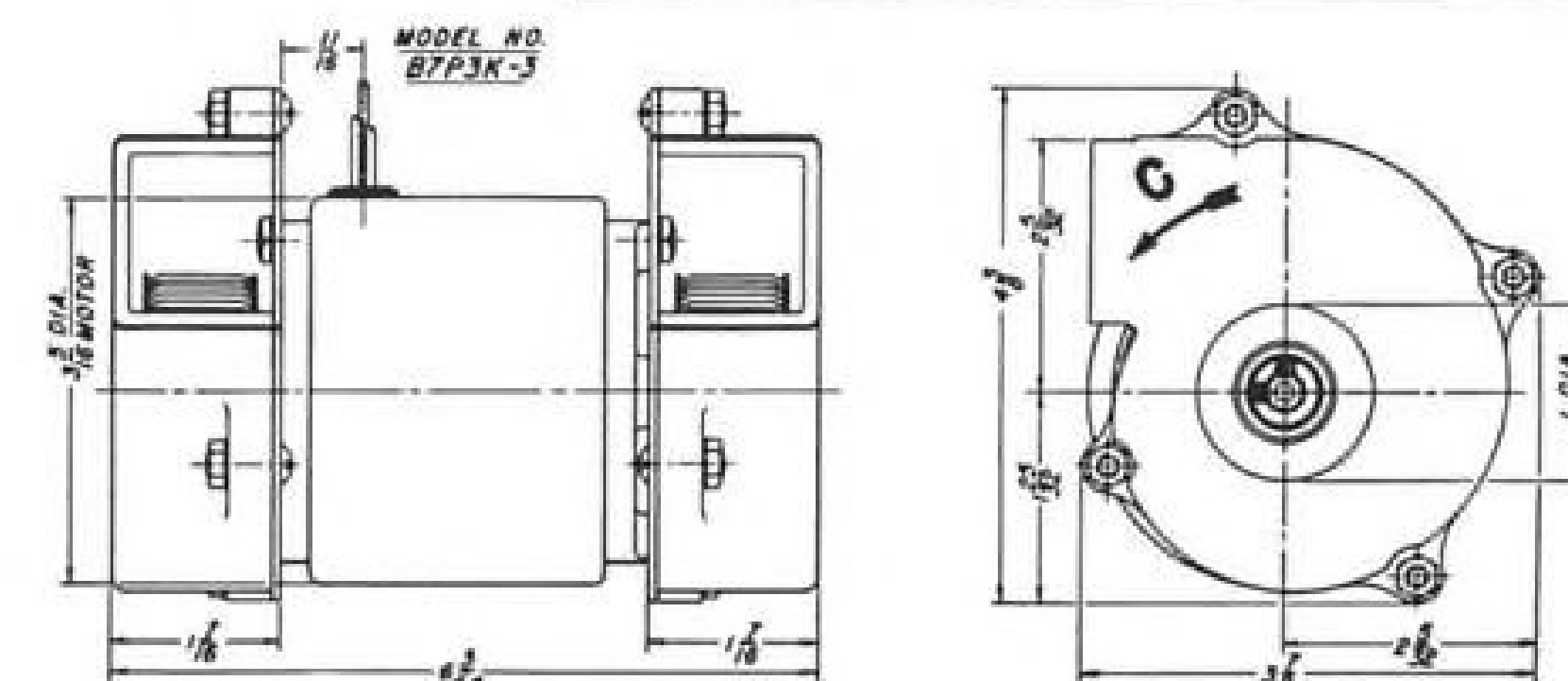
The motor meets the temperature, al-



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OPERATING TEMPERATURE RANGE: -55°C to $+85^{\circ}\text{C}$.

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MOUNTING: Any Position.

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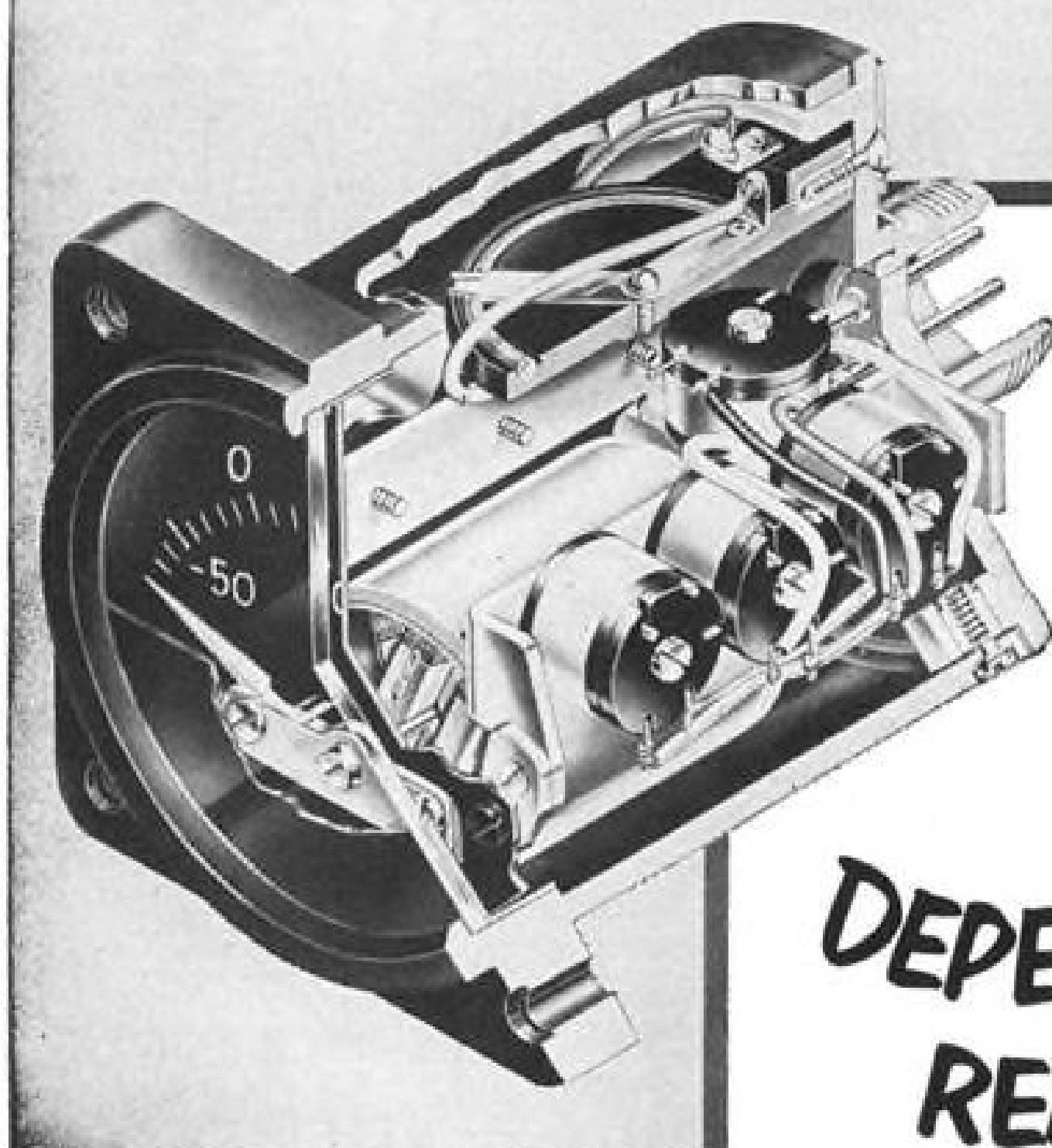
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titude and vibration requirements of Spec. MIL-E-5272. Weight is 8 oz.
A. W. Haydon Co., Waterbury, Conn.

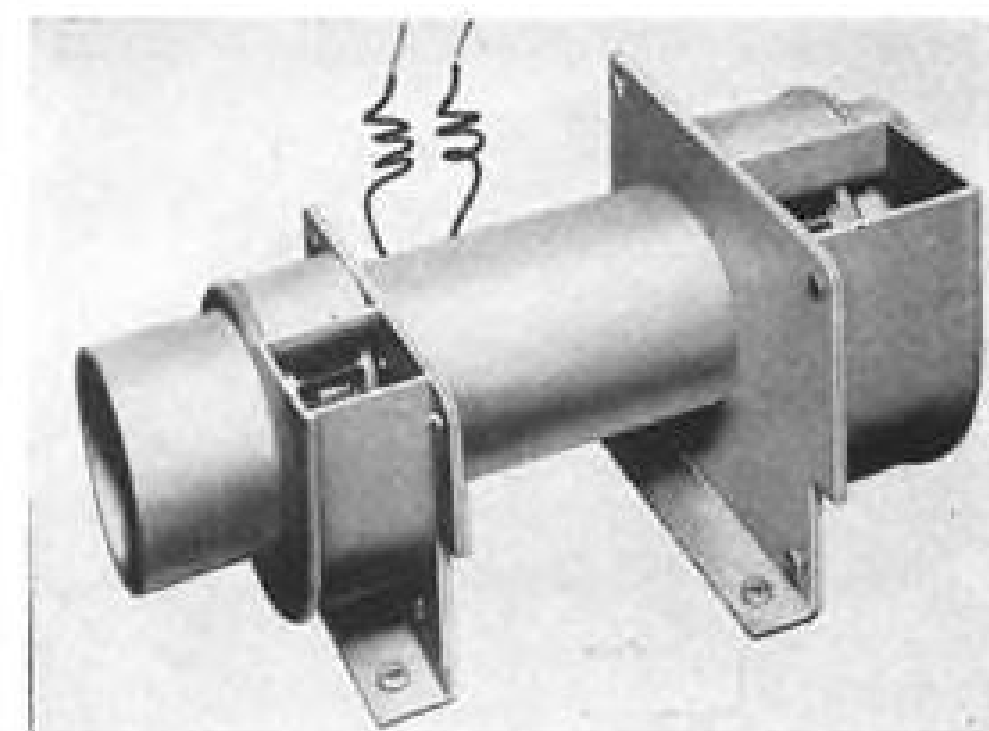
Steatite Terminals

An expanded line of hermetically sealed steatite terminals that are claimed to be strongly resistant to mechanical and thermal shock has been announced for use on metal enclosures for components.

Soldering is much simplified by the hot-tinned metallized surface and the terminals stand up to the high temperatures necessary for soldering over prolonged periods with little ill effect, according to the manufacturer. These solder-seal terminals are offered in a variety of sizes and shapes; types include threaded terminals on one end, threaded terminals at both ends, or "thru holes" with a terminal lug at the external end.

Manufactured out of glazed steatite and metal, the terminals have no rubber or plastic gaskets. Available in either brown or white glaze color.

General Ceramics & Steatite Corp., Keasbey, N. J.



Avionic Blowers

Blowers for cooling aircraft electronic equipment are being produced in a wide range of motor types by Howard Industries, Inc.

Model 100 is rated at 1/50 hp. at 27½ v. d.c., delivering a relatively constant air output of 40 cfm. at 50,000-ft. altitude while turning at 6,500 rpm. This performance is maintained at sea level with a speed of 4,500 rpm. The units are tested and approved for aircraft applications and maintain rated performance at temperatures down to -65F, says the maker.

Howard Industries, Inc., 1760 State St., Racine, Wis.

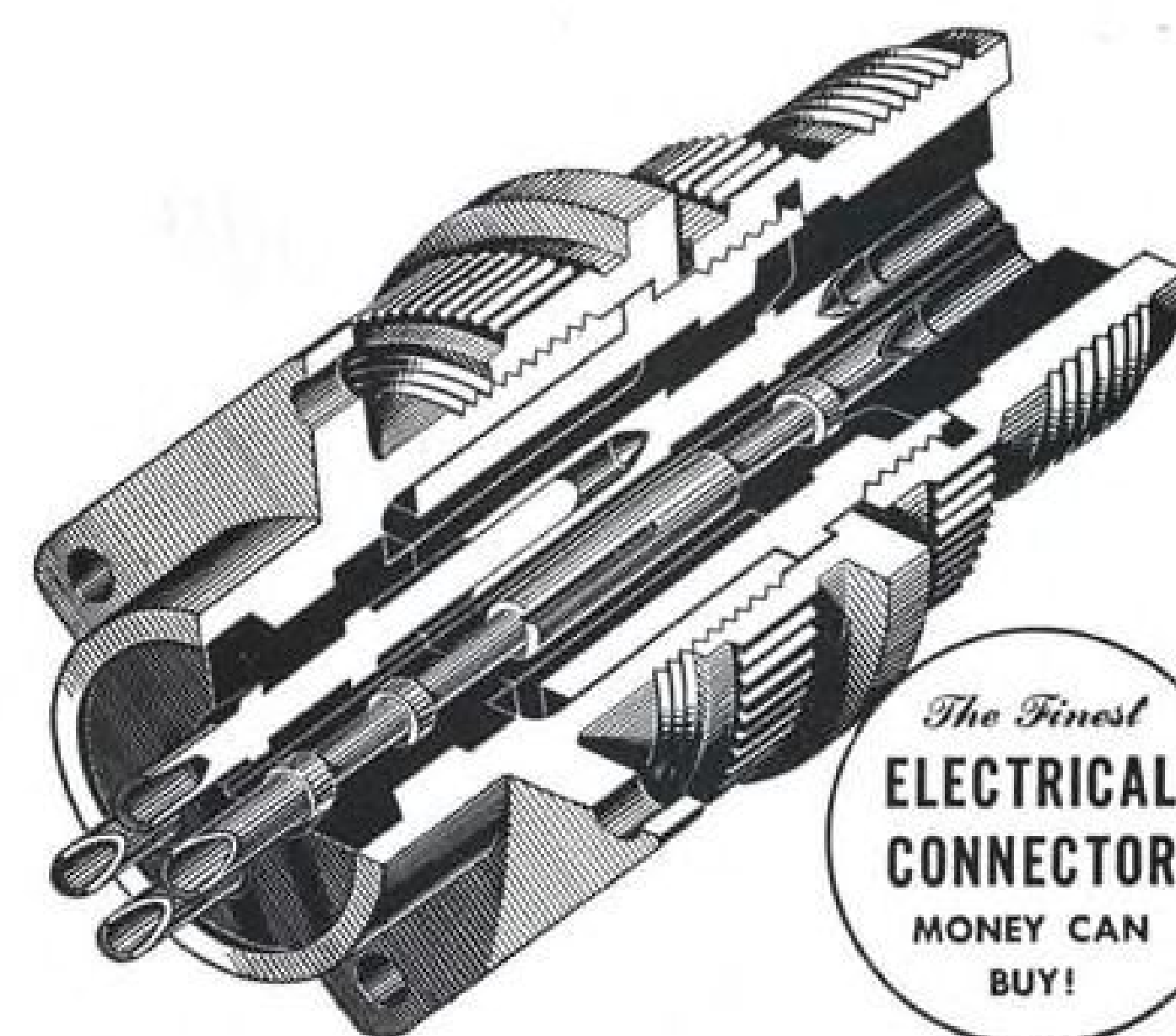
Fibers Float Flyers

The Fiber Glass division of the Pittsburgh Plate Glass Co., organized less than a year ago, recently began production of "superfine" fiber glass.

The material—short fiber in mat form—is used by Navy and Air Force

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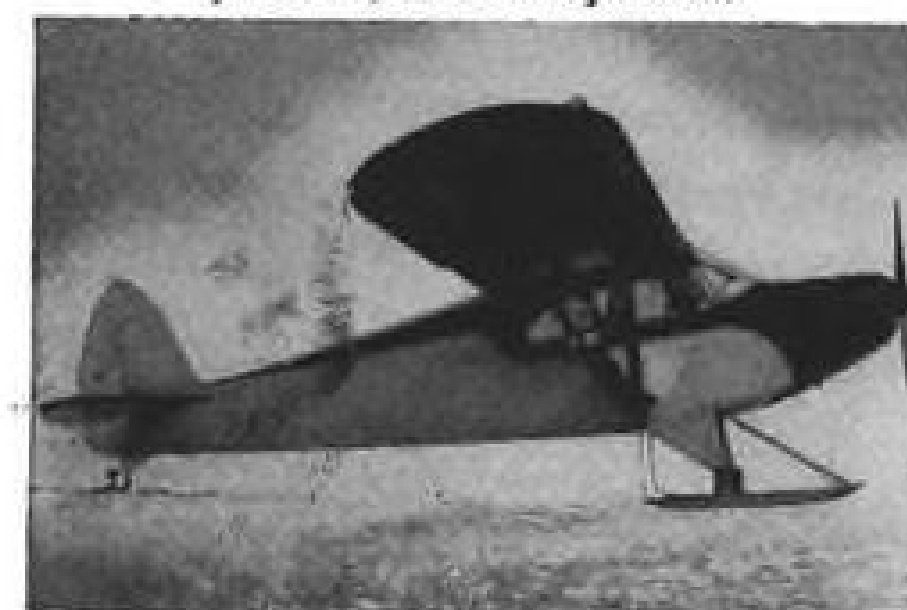
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for acoustical and thermal insulation in aircraft and also for flotation gear. Continuous fiber strands, soon to be produced, are used for electrical insulation and for noncombustible fabrics. Chopped strands are used as a reinforcing agent in such plastics as the Selectron resin made by the firm. Fiber glass reinforcement imparts both rigidity and strength.

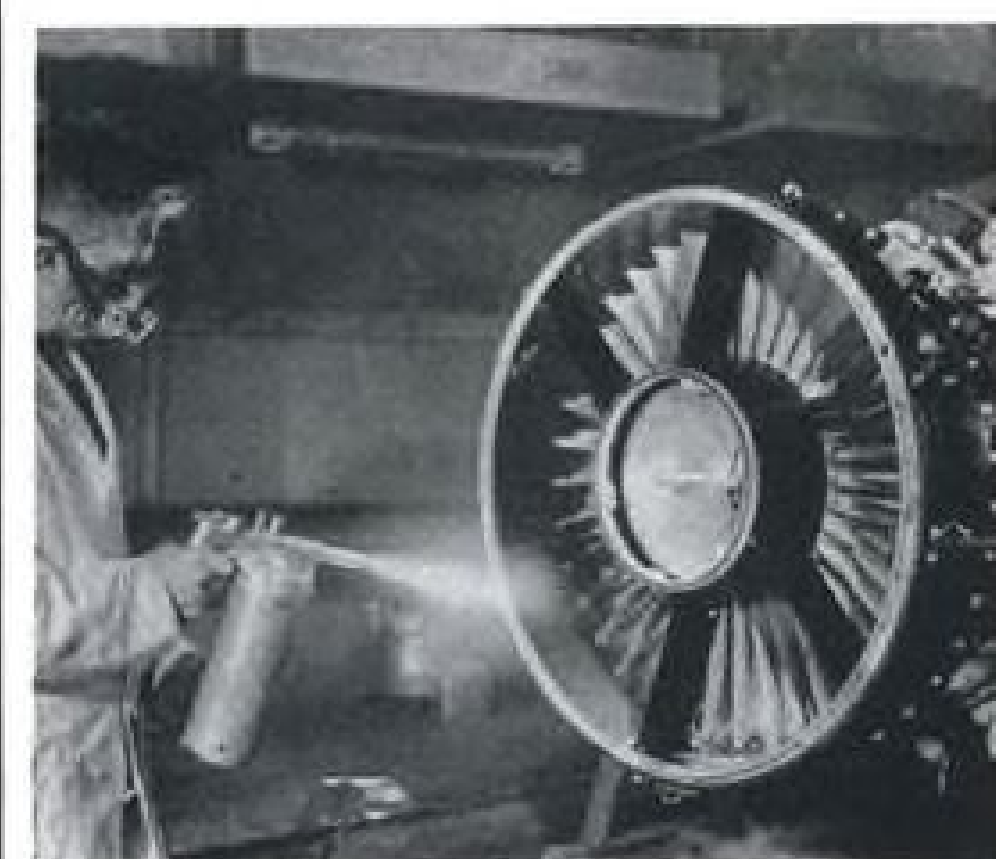
ALSO ON THE MARKET

Mid-air refueling leaks are prevented by specially machined Teflon seal installed in quick coupling through which transfer is made. Rings are cut to close tolerance and smoothed to very fine microfinish, says producer, Mic-Lin Co., Land Title Bldg., Philadelphia 10, Pa.

Xerography camera has been developed to reduce large drawings onto an $8\frac{1}{2} \times 13$ -in. XeroX plate from which offset paper masters are made for producing copies on an offset duplicator. Xerography is a dry, direct positive process requiring no water, chemicals, film or sensitized materials. Haloid Co., Rochester, N. Y.

Pilots get better perspective with Runway Finder, a card device which gives heading information in graphic plane-runway relationship to aid in approaches of lightplanes to airports. Sold by Wiggins Airways, Norwood, Mass., for 50 cents.

Fixture clamp is quick-acting, suitable for riveting and aircraft assembly work. Of forged steel, part also can be used in tougher milling and other machine-tool cutting operations, according to distributor, Centinela Industrial Supply Co., 11930, Inglewood Ave., Hawthorne, Calif.



ANTI-CORROSION SPRAY

Corrosion in this Rolls-Royce jet is prevented by spraying Shell Oil's VPI powder (vapor phase inhibitor) into engine which then is wrapped in paper for protection (Aviation Week Sept. 10, 1951, p. 48). Austin Motor Co. uses it to preserve overseas shipments from rust.



for example, the

CONVAIR-LINER 340

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America's newest and largest twin-engine transport—the Convair-Liner 340—cruises at nearly 300 miles an hour. Pressurized and air-conditioned, the big transport (gross weight 47,000 pounds) has 44 richly upholstered seats. Power plants are 2400 horsepower Pratt & Whitney R-2800 engines.

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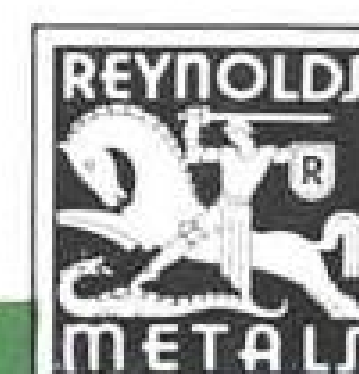
● **SHAPE OF THINGS TO COME**, interesting description of the aluminum extrusion process and the design opportunities it provides. Running time 30 minutes.

● **TALE OF THE POWDERED PIG**, Developments in aluminum powders and pastes including their application in protective and decorative coatings. Running time 22 minutes.

● **PIGS AND PROGRESS**, The complete story of aluminum from mine to finished products. Covers all forms of aluminum. Running time 26 minutes.

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Making "Cushions" from Steel

This Cleveland Pneumatic craftsman is machining part of the main landing gear for the Boeing KC-97A Flying Tanker. Heat treated alloy steel gives Cleveland Pneumatic Aerol landing gear super strength to withstand the terrific impact created when a huge bomber meets the ground. Yet Aerols act like soft, resilient "cushions" because they absorb all landing shock, and enable the plane to land with ease and safety.

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AIR TRANSPORT



PIASECKI H-21, capable of airlifting 12 litter patients and an attendant, is copter MATS wants for domestic airport-to-hospital shuttle.

MATS Tests Copter-Ambulance Shuttle

- Regular service on airport-to-hospital run due next year; plans call for fleet of 25.
- Sikorski H-19 is used in one-week trial at Andrews AFB; but service hopes to get Piasecki H-21s.

By Lee Moore

Transport helicopters will start replacing auto ambulance service from Military Air Transport Service airfields to major hospitals in the U. S. next year. MATS plans to get its first copter ambulance in six months and would like to buy 25 eventually. MATS air surgeon Brig. Gen. Wilford Hall says he's confident of getting a few next year, but the request for 25 depends on the tight military copter priority situation in Korea and elsewhere.

The day of large-scale commercial transport airplane and copter movement of private patients to specialized hospitals may have been brought a big step nearer to practical test by this MATS development.

MATS has just completed a week's demonstration of copter movement of air-evacuated litter patients direct from their C-54s as they land at Andrews AFB, near Washington, to the three major military hospitals in the metropolitan area—Belvoir, Bethesda and Walter Reed.

► Want H-21s—MATS used a Sikorski

H-19 borrowed from Air Rescue Service. MATS looks forward to availability of the bigger Piasecki H-21s later. Gen. Hall says the next step is to develop specifications for copter modification to meet special ambulance requirements. This was one purpose of the recent one-week operation at Andrews Field with the borrowed copter.

Gen. Hall says MATS wants 25 ambulance copters for use at nine bases serving about 25 military hospitals to which auto ambulance service is slow, traffic congested and roads rough. Tentative plans call for spotting these 25 copters as follows: Washington (Andrews AFB) 3; San Francisco (Travis) 3; Denver (Lowry) 2; New York (Mitchel) 2; Norfolk (Langley) 2; San Antonio (Brooks) 2; Rome, N. Y. (Griffiss) 2; Philadelphia (Willow Grove) 2; and Tacoma (McChord) 2; the remaining five would be the reserve to back up a continuous operating strength of the 20 located as above.

The air evacuation fleet of MATS operating within the U. S. consists of 10 C-54s on the trunk routes and 28

C-47s on local feeder routes. The 25 copters would add cross-city shuttle routes—thus completing air evacuation from battlefield to U. S. base hospital.

A battle casualty starts out by copter to an airfield hospital behind the lines. From there, he is lifted to Tokyo by C-46 or C-47 feeder. From Tokyo, he is lifted over the Pacific by pressurized C-97 or other long-range planes. At Travis AFB on the West Coast he is assigned to a U. S. hospital and the domestic MATS system takes over.

► West Coast to Hospital—AVIATION WEEK witnessed a typical MATS dispatch of air-evacuated Korean casualties from Travis AFB to Washington hospital beds. The plane was a C-54 bound into Andrews Field with casualties from Korea. Aboard were 12 litter cases and 15 "ambulatory" patients.

Travis had classified the patients as to treatment needed, their armed forces branch, their home of record or preference. Balancing these factors, Travis assigned the men to hospitals most suitable to their ailment, armed service branch and home—locating them as near home as practicable.

The routine teletype dispatch from Travis preceding arrival of this particular planeload coded the patients by ultimate destinations as follows (first figure litter cases, second ambulatory): Belvoir, Va., 2 and 2; Bethesda, Md., 2 and 6; Walter Reed, D. C., 5 and 3; Pickett, Va., 1 and 0; Norfolk, Va.,



PATIENTS TRANSFER from MATS C-54 (left) at airport to H-19 copter, then . . .



PATIENTS LAND at military hospital, avoiding surface traffic congestion.

0 and 1; Perry Pt., Md., 0 and 1; Philadelphia, 0 and 2; Murphy, Mass., 2 and 0.

From this flight, nine litter patients and 11 ambulatory cases were scheduled for the three hospitals in the Washington area.

The borrowed copter carries only four litters, although an H-19 could take six litters. This one had to make three roundtrips to the hospitals to deliver the nine litter patients, but two H-19s could have delivered all litters plus the more serious of the ambulatory cases.

A fleet might be necessary, not only to take care of the one flight properly, but also because two or more transport loads may arrive at about the same time.

A C-54 with six litter cases and 17 ambulatories arrived at Andrews from Westover AFB (originally Europe) an hour after the Travis flight.

The patients bound for more distant hospitals from Massachusetts to Virginia were scheduled for transfer to the MATS "feeder" C-47 service. One northbound C-47 picked up the group headed for Perry Pt., Philadelphia and Murphy. A southbound C-47 took those assigned to Camp Pickett and Norfolk, Va.

The patients remain in the C-54

until transfer to copter or C-47. Thus, when this shorthaul copter service becomes available, seriously wounded patients will be moved under controlled conditions half way 'round the world direct to specialized hospitals for treatment.

► **Why Helicopters?**—MATS and the medical services have made an extensive study of air evacuation benefits to patient movement. Gen. Hall says the cost of the special copter service at key points would be justified, but MATS has not yet prepared detailed budget justifications.

Here are the main advantages listed by MATS: Presently, "patients must continue (from major offload airfields) by ground ambulance, often for considerable distances through congested traffic and over secondary roads to hospitals of final destination. Helicopters eliminate these hazards, speed patients to surgical and medical care in greater safety."

For the Washington, D. C., area—not the worst surface transport air-evac problem by any means—copter time from Andrews to hospitals averages 15 to 20 min. compared with road time of 1½ to 2½ hr. largely through city traffic.

Gen. Hall points out that Andrews AFB receives about 400 air-evac pa-

tients a month. Of these, 50% or 200 are in the "seriously ill" category by MATS standards. That means an average of seven seriously ill patients landing per day, which might sound like a small number to require three helicopters standing by. But this life-saving operation is different than a scheduled commercial venture.

• First, the patients move to three different specialized hospitals in the area.

• Second, two C-54 flights may arrive at Andrews at the same time.

• Third, monthly averages do not reveal the statistical deviation that can lead to perhaps 30 seriously ill patients arriving together on occasion.

• And finally, there are certain by-product advantages. MATS also moves patients from one hospital to another. Andrews has 100 outgoing cases per month, of which about 50 are in the seriously ill category.

MATS is convinced it will acquire all 25 copters eventually; a few next year, others later.

Carriers Make Poor Showing at Hearing

The first three airlines to testify as Civil Aeronautics Board reopened its nonsked investigation in Miami produced odd results:

• The first nonsked, Aero Finance Corp., eliminated itself from the case by refusing to reveal its owners. This made a bad blot on the nonsked case generally.

• The first scheduled airline, Eastern, produced only one policy witness, who said during cross-examination by CAB Bureau Counsel Ronald Cohen that he "did not know" the answers to most questions put him about Eastern coach policy. This did not help the scheduled airlines' case either. The more progressive and informative tack taken previously by policy witnesses of scheduled coach leaders—TWA and American, for instance—was an all-out endorsement of coach expansion.

• The second nonsked, All-American Airways, asked authority only for charter-type, plane-load passenger and cargo operation, whereas most of the applicants seek permission to continue and expand route-type passenger service.

Key issue in the CAB case is to find a regulatory formula that would allow nonskeds a normal business incentive, yet without ruinous competition to scheduled airlines.

► **Aero's Refusal**—CAB examiners Ralph Wiser and Richard Walsh dismissed Aero from the case. Aero would not reveal its present stockholders and Aero witness E. J. Averman balked at cross-examination.

► **Eastern's Reticence**—Eastern's one policy witness, Robert S. Lipp, as-



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sistant to the secretary and treasurer, made a brief statement that Eastern opposed any route-type authorization for nonskeds.

He said Eastern Air Lines generally agreed with CAB's original non-sked policy statement of May 25, 1950. But even there he said he "thought" Eastern objected to the CAB authorization of a maximum of three trips a month between major cities by nonskeds.

To all bureau counsel questions on Eastern's current view of daylight aircoach operation, Lipp answered either that he "didn't know" or that since Eastern had only operated such service for 10 days it couldn't know much about it.

Lipp admitted that Eastern's Nov. 1 inauguration of daylight coach evidenced a policy change from the time of its opposition to such service by National.

But when Cohen asked him what led to the change Lipp said he was unable to answer. However, he implied that National's competition was the main item when he said that if National used DC-6s on daylight coach Eastern would use Constellations. Both use DC-4s now.

Nonsked attorney Albert Bietel then proceeded to nail witness Lipp down to the main issue of the case—the knotty problem inherent in the nonskeds' economic position, now that the scheduled, certificated airlines have invaded aircoach.

Nonsked (Bietel): When did Eastern start providing aircoach service?

Eastern (Lipp): September 1949.

Nonsked: And what carriers were providing coach service out of Miami at that time?

Eastern: None.

Nonsked: Were there any non-scheduled air carriers providing coach services out of Miami?

Eastern: I don't know for a fact but I assume there were, yes.

Nonsked: When these nonscheduled air carriers commenced that aircoach service out of Miami, Eastern was not providing any aircoach service. Is it Eastern's position that if a pioneer goes into a business that thereafter the certificated air carrier along that route should not be subjected to competition by that pioneer if the certificated air carrier decides to go into the new business?

Eastern: That is about what it boils down to, yes.

Nonsked: Is (that) an incentive to the new company, which originally started the aircoach service?

Eastern: No, I don't imagine it is much of an incentive to them. But they do have the right to come to a hearing for a certificate. That is an incentive.

Japan to Announce Pacific Air Service

Japan will announce shortly certification of one and perhaps two international airlines with routes across the Pacific.

Leading contender is Japan Air Lines, which has an operating contract with nonsked Transocean Air Lines to operate its planes.

Close behind is Japan International World Airways with a contract for operation by nonsked California Eastern Airways.

Both claim confidence of early trans-Pacific certification by the Japan civil aeronautics authority. But only one may get it (AVIATION WEEK Oct. 6, p. 89).

Transocean executive vice president Samuel L. Wilson told AVIATION WEEK that the Japanese government almost certainly will certificate only JAL on the Pacific route. JAL officials, Wilson and Croil Hunter (board chairman of Northwest Airlines, former prime contractor for JAL operation), have endeavored to persuade the Japanese government that only one airline could operate without subsidy at the start. Two competing lines would both need subsidy, they argued.

► **Counter Proposal**—But California Eastern President Sam J. Solomon told AVIATION WEEK that he had just received word that JIWA-Cal Eastern would probably get a trans-Pacific certificate this month. JIWA and Cal Eastern counter the JAL-Transocean argument with an opposite proposal: Certificate competitive companies and let the more successful one or both survive on the merits.

Both plan trans-Pacific operation. JAL-Transocean proposes Tokyo-Oakland service, starting with two 75-passenger DC-6Bs converted from Slick DC-6As. JIWA-Cal Eastern plans Tokyo-San Francisco-Brazil service, starting with DC-4s.

Britannia for Africa Run

(McGraw-Hill World News)

Johannesburg—Initial service of the new turboprop-powered Bristol Britannia transport will be on the London-African run. British Overseas Airways Corp. has applied for permission to start aircoach service in December from London to Rome, Cairo, Khartoum, Entebbe, Nairobi, Lusaka and Salisbury, using 56-passenger Handley Page Hermes transports, but has stated that these will be replaced with Britannias.

Proving flights are expected to begin late next year and regular service in 1954. The Britannia can carry 104 passengers and will cruise at approximately 400 mph.

Log of SAS' Trans-Polar Flight

(McGraw-Hill World News)

Copenhagen—Following is from the logbook kept by Second Pilot Sven Gibson on the Scandinavian Airlines System's DC-6B delivery flight—California to Denmark via the North Pole.

1750 (5:50 p.m. Pacific Time): We climb above the mountains and the desert just north of Los Angeles. We mount to 15,000 ft. in order to be clear of the mountains; weather clear, beautiful and wonderful up here.

2030: The highest peaks of Rocky Mountains are visible through the blanket of clouds.

2220: Helena Radio asks for an interview with the Danish and Norwegian ambassadors. They speak to the Scandinavian listeners just north of the Canadian frontier. No more mountains, no more clouds. I look down upon the high plains with the endless chessboard of the Canadian wheat fields.

2356: Landing in Edmonton.

0122: Departure for Thule. Darkness. No sun before Thule as we have crossed the Polar Circle. Promising weather, fresh southerly wind to begin with and later a following wind. Flying time suggested, 6 hr. 45 min. Height 17,000 ft. 4,500 gal. in the tanks.

0630: Flying by the stars. As we approach magnetic North Pole compass completely unreliable. Knew it would

happen and therefore use gyro checked by observations of stars. Works to a miracle. Reach Thule exactly according to schedule, but have to circle 'round the field for a quarter of an hour before we are allowed to land.

0850: There is a heat wave in Thule just now, that is, it is warmer than -40F. All the American GIs on outdoor duty are carefully wrapped up. It is warm and cozy in the military barracks, but unfortunately our stay is too short for us to feel at home.

1052: Start again and climb to 17,000 ft. to have a quiet trip above the Greenland inland ice. The sun never rises here and one has a feeling of flying at the same time at dawn and dusk in the icy polar night.

1400: Off the coast (Greenland) immense stretches of floating ice forming a more or less compact mass all along the horizon. Hardly do we leave the ice and fly above the open sea when the contours of the snow-covered volcano on Jan Mayen emerge above sea level. We have time to take a turn around it.

1508: We approach the Norwegian coast, and it is getting dark again.

1730: Passing Aalesund and steering towards Denmark in the last lap across the open sea.

2147: Make a wide circle above Kastrup Airport and land 13 min. before schedule. Taxi to the hangars and into the spotlights of the film cameras.

Polar Route Approval Predicted

World acclaim of Scandinavian Airlines System's one-day flight over the North Pole from Southern California to Europe will make it difficult for Civil Aeronautics Board to deny the route to SAS for scheduled service. Washington observers now believe both SAS and Pan American World Airways will end up flying the route.

State Department already is urging CAB to grant rights to the Scandinavians. State argues that Europeans would resent any U.S. dog-in-the-manger attitude denying to SAS what we don't want ourselves. The counter-argument is that the U.S. already has given SAS more in New York than PAA gets out of its Scandinavian market rights. But that wouldn't mollify the Europeans.

So, in a recent special conference between CAB, State and the interested U.S. carriers, the airlines said if SAS gets the route a U.S. carrier must get it, too (AVIATION WEEK Nov. 24, p. 15).

► **Problems**—This presents another difficult problem for the Board. U.S. operation of the route would need heavy subsidy, CAB believes.

Yet a decision to let SAS fly the route alone would pose still another problem: It would compete indirectly with both Pan American and TWA. Pan American serves Scandinavia from New York; the SAS service would take away some West Coast passengers traveling this route of PAA. TWA has a transcontinental and trans-Atlantic route. SAS presumably would tap the West Coast TWA circuit too.

So Washington observers see CAB opening a "trans-Polar route investigation case," as predicted in AVIATION WEEK (Oct. 6, p. 14).

The trail-blazing flight of SAS from Los Angeles to Copenhagen took 28 hr., 7 min., of which 23 hr. 38 min. was flying time. Distance was 5,852 mi. Enroute stops were Edmonton, Alta., and Thule AFB, Greenland. The New York Times hailed the successful DC-6B delivery flight: "Twentieth century Vikings, winging their American-built plane across the Arctic icecap, blazed a dramatic new era of commerce . . ." The N.Y. Herald Tribune said about the same.

SAS plans a second flight this week; operation is expected next spring.



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run is the most important domestic monopoly route that CAB Democrats aim to make competitive.

► **Civil Aeronautics Administration**, representing the U. S. may abstain from ICAO vote on a world standard of centerline approach lighting. This way CAA can avoid conflict with AF and Navy, who object to that system; yet standardization could eventually bind the U. S. to that standard, which is desired commercially.

► **Civil Aeronautics Board** mail rate section considers its three most important current cases the Braniff Domestic Rate (Post Office demanding earnings equalization reserve), Trans-Atlantic Rate and Northwest Pacific and Alaska Rate.

► **Continental Air Lines** is reported actively considering use of track-mounted seating in its Convair 240s, but Convair says no order has been placed. Convair is still urging U. S. operators to buy this flexibility, which would enable the 340 to carry up to 56 passengers with little or no inconvenience in switching back and forth from the standard 44-seat version.

► **International Civil Aviation Organization** assembly is slated to open June 16 at Brighton, England.

► **New York Airways** temporary copter mail rate proposed by CAB is \$429,000 a year, which the Board considers break-even need. This is \$2.50 a mile until 14,300 miles a month and \$1.06 a mile for further mileage in same month.

► **Northwest Airlines** final domestic mail rate is set by CAB at 53 cents a ton-mile. But financing of new planes may await CAB decision of its international mail rate. Examiner hearing was slated for last week. Northwest and the Board staff hope to expedite it, if parties waive an examiner report.

► **Pan American World Airways** has granted pilots an 11% pay boost. New captain rates average about \$1,000 to \$1,350 a month, copilots \$700 to \$900.

► **Pan American-Grace Airways** is plugging its souped-up DC-6s as "fastest piston-engined airplanes in commercial transportation." Panagra accomplished this by converting its DC-6s to the newest Ham Standard props and Pratt & Whitney CB16 engines. With power equal to the DC-6B, the smaller DC-6 goes faster. It is expected to be king until the arrival of DC-7 and Super Connie with Compound engines, but neither of these has been ordered to date by Panagra competitors.

Air Transport Boom Noted in Canada

More than a 300% increase in ton-mileage in the past six years by Canadian air carriers has been cited by Air Industries and Transport Assn. President Grant McConachie as proving that Canadian aviation is "an industry whose future knows no bounds."

Reviewing the carriers' growth, before 350 key aviation personnel meeting in Montebello, Quebec, McConachie pointed out that 1,501,130 revenue passengers were carried by Canadian airlines in 1951, about five times the number flown in 1945; more than 25,000 tons of cargo were flown last year, compared with 6,000 tons six years previously.

Total operating profits in 1951 were \$5,371,619 on a gross of \$55,589,812, with six Class A carriers accounting for a gross of \$48,887,894. Last year marked the first annual period that the smaller carriers, grossing more than \$10,000 yearly, showed an overall profit.

Three major reasons for this prosperity were given by the AITA president:

- **Tariff-free entry** of planes and parts of type and sizes not made in Canada.

- **Amendment** of the Industrial Development Bank Act, permitting operators to make long-term loans.

- **A 40% allowable rate** of depreciation for income tax purposes, allowing an accelerated rate of depreciation of assistance obtained, thus making capital investment in air transport firms more attractive.

But, McConachie warned, "the Canadian public has a right to expect us to bring them more and better services." He noted needs of the mining industry for improved air service and the forestry and agricultural fields for aerial spraying and dusting operations.

SHORTLINES

► **Air Coordinating Committee** chairman is recently designated CAB Chairman Oswald Ryan. Commerce Assistant Secretary Thomas Davis had been acting ACC chairman after resignation of Donald Nyrop.

► **American Air Traffic Conference** voted Harding Lawrence of Pioneer Air Lines as president, Charles Speer of American Airlines as first vice president, and Robert Turner of Northeast as second vice president. C. C. (Chuck) Hubbard succeeds Merrill Redfern, who died last summer, as executive secretary.

► **American Airlines'** New York-Dallas

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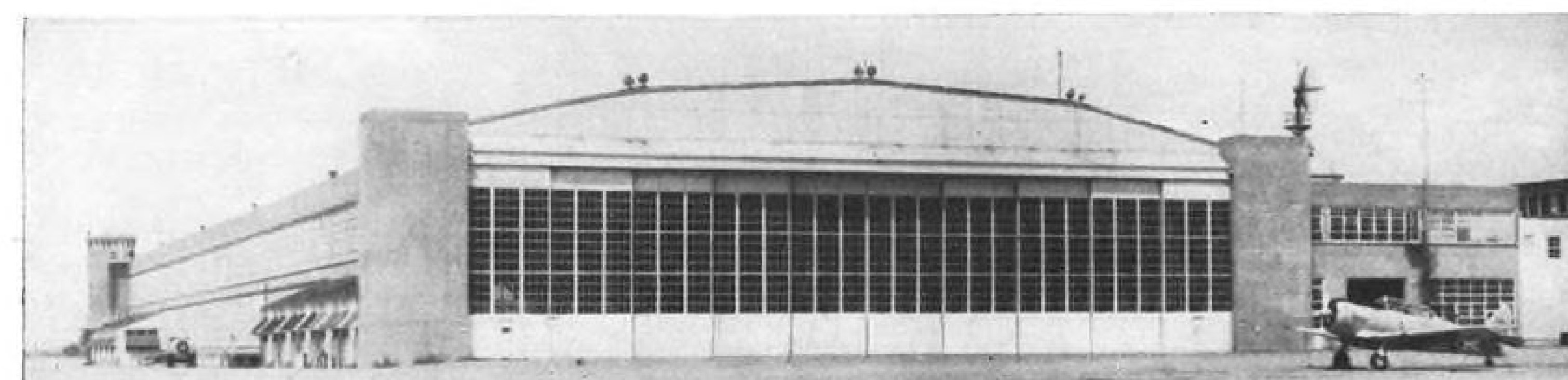
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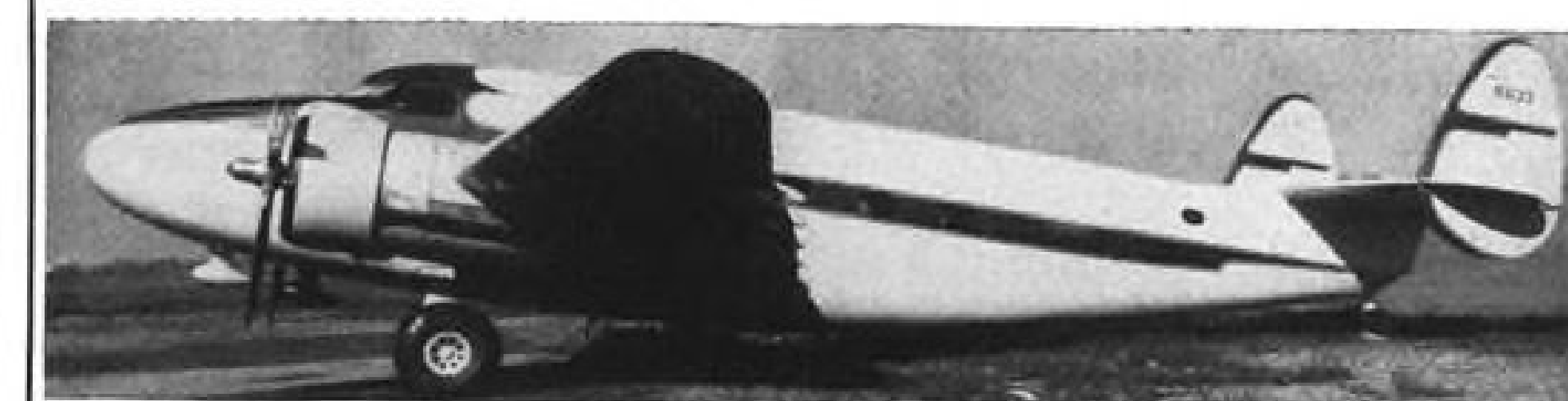
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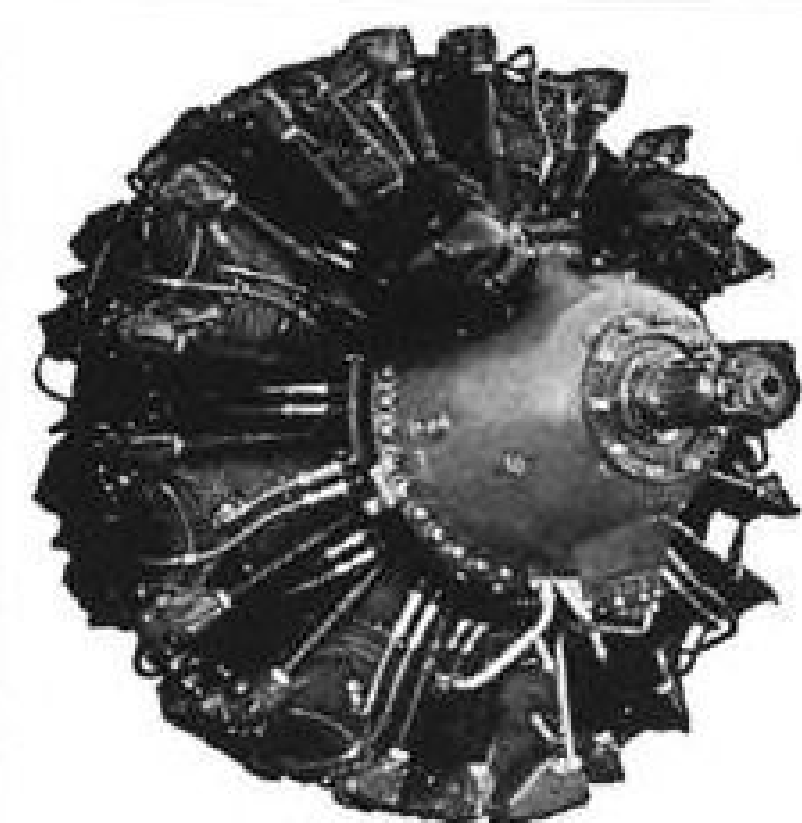
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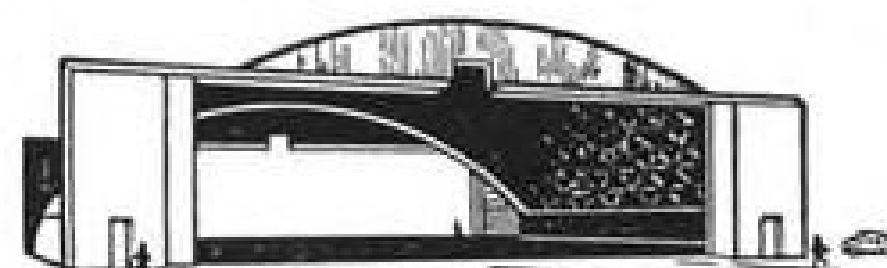
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40	119862	Weston	Carb. Air Temp Indicator
10	15401-1	Eclipse	Amplifier (PB10)w/ED3 MOUNT
66	10078-1AG	Eclipse	Gyro Indicator
62	CQ-9	Eclipse	Clutch Switch (PB10)
57	MF45-3911-90Z	Vickers	Hydraulic Pump (3000PSI)
327	PF4-713-20BCE	Vickers	Hydraulic Pump
75	1416-12E	Eclipse	Starter
142	98008	Airessearch	Jack (Cowl FLAP)
45	AN4103-2	Clifford	Brass Valve #U4785) Oil Cooler
120	MF9-713-15A	Vickers	Hydraulic Pump
550	TFD 8600	Thompson	Fuel Booster Pump
125	D7818	Adel	Anti-icer Pump
250	AN4014	Erie Meter	Wobble (D-3) Pump
1000	AN5780-2	G.E.	Wheel & Flap Position Indicator
400	AN5780-2	Weston	Wheel & Flap Position Indicator
115	P4CA2A	Parker	Primer
70	AN3813-1	Scintilla	Ignition Switch
450	A-9 (94-32226)	Nasco	Ignition Switch
90	JH950-R	Jack & Heins	Starter Motor
53	AN6203-3	Bendix	Accumulator 10"-1500 P.S.I.
140	K14949E	Marquette	Windshield Wiper Kit
188	EYLC-2334	Barber-Colman	Control
11	12086-1C	Eclipse	Amplifier
250	558-1A	Eclipse	Oil Separator
100	716-3A	Eclipse	Generator (NEA-3A)
89	318	Edwards	Horn
230	921-B	Stewart-Werner	Heater (200000 BTU)
97	5041H-146A	Cutler Hammer	Relay (B-12)
22	0655-D	Aro	Oxygen Regulator
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384	564-2A	Eclipse	Oil Separator

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	(manufacturer's part No. 10-12453-6 Spec. AN9511)	Bendix Scintilla Magneto
42	SF5RN-12	Bendix Scintilla Magneto
	(manufacturer's part No. 10-26170-1)	
185,000	LS4AD1	Spark Plug (Aero)

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LETTERS

From Cornell Lab

We refer to your issue of Nov. 3, "So They Tell Us," on page 96, wherein reference is made to this laboratory.

The item places us under the general category of universities. Actually this is not quite so. We are a separate, self-sustaining corporate entity wholly owned by Cornell University, operating at Buffalo, N. Y., dedicated to the performance of research and experimentation in the wide and complex fields of the aeronautical sciences.

The great majority of our contracts are, and probably will continue to be, the result of awards by the various agencies of the Department of Defense as long as we can contribute materially to the national good. We do not believe we should be considered as a competitor of the aircraft industry since we do not engage in production work of any type.

JOHN J. O'NEIL, Contract Manager
Cornell Aeronautical Laboratory, Inc.
4455 Genesee Street
Buffalo 21, N. Y.

(Some aircraft and missile firms do feel that competition exists, especially those companies energetically seeking research contracts.—Ed.)

'Best Reporting Job'

I have noted with interest and approval your story by Irving Stone in the Nov. 17 AVIATION WEEK of the heavy press program. In our opinion, this is the best reporting job that has yet been done in connection with this important phase of the aircraft program. The summary in the box on page 50 particularly appeals to me as the best summation of the situation which we have seen.

Because of the very nature of the program and the history of its origin, there has been more emotion and enthusiasm than facts in much of the editorial comment. We believe your article is a real contribution toward dispelling many false impressions previously created and represents a thoroughly fair evaluation.

ROBERT W. STODDARD,
Executive Vice President
Wyman-Gordon Co.
Worcester 1, Mass.

We would like to express our appreciation for the excellent job which Irving Stone did in correcting the misunderstandings and misconceptions insofar as the Wyman-Gordon participation in the heavy press program is concerned. The article was very well written and was very gratifying to us. Would you forward to me twenty-five (25) copies together with the invoice.

LOREN K. HUTCHINSON
Assistant to Executive Vice President
Wyman-Gordon Company
Worcester 1, Mass.

Dislikes Foreign News

Recent editions of AVIATION WEEK in-

dicate apparently that it is not possible for U. S. aviation to develop new aircraft or current aircraft. All of your articles in the recent editions indicate that only the British, and, of all things, the French, are the only people that can develop new and advanced aircraft. Add to this the Swedish aircraft design company.

We have always found your publications most informative and valuable, not only to ourselves, but our customers, such as people like Consolidated Vultee Aircraft of Fort Worth; Chance Vought Aircraft of Grand Prairie; Temco Aircraft of Grand Prairie; Douglas of Tulsa; Boeing of Wichita; Cessna of Wichita; and Beech of Wichita; etc.

Take your edition of Sept. 22, for example—the majority of the advertising is paid for by United States airframe manufacturers, their vendors and sub-contractors, but the majority of informative articles are in relation to British or Swedish aircraft.

Is it really true that we are not able to develop aircraft as advanced as the British and the Swedish and the French? In our business, we negotiate with design engineers on new models coming up and in our limited area here, our opinion is quite different. We believe that we have the finest and the most advanced aircraft in the air, in production and in design.

Your remarks will be most interesting.
J. W. LYONS, President
Lyons-Coleman, Inc.
P. O. Box 6028
Dallas, Texas

(Your letter to Mr. Wood indicates you did not read the articles written by Engineering Editor David Anderton and myself from England very thoroughly. In both the Sept. 8 and Sept. 15 issues I pointed out that the British display consisted entirely of prototype aircraft and that the American-designed-and-built F-86 Sabre was the most advanced fighter aircraft actually in production and available for combat service on this side of the Iron Curtain. The fact that AVIATION WEEK gives such extensive coverage to new developments in British aviation does not imply, except if and when we specifically say so, that British aircraft are any better or worse than American models. We know that American aircraft manufacturers are extremely interested in what their competitors are doing and their response to our coverage of British aviation indicates that they appreciate the service we are rendering them in this respect.—R. B. H.)

Likes Accident Reports

I wish to commend AVIATION WEEK on publishing another Accident Investigation Report Oct. 20. However, on page 84 there appears a statement to the effect that the administrator sent a telegram on Feb. 19 requiring compliance with this telegram not later than midnight of Feb. 18. Another statement is made to the effect that a reactivation program in compliance with the terms of the Feb. 19 telegram was started on Feb. 15, and completed on Feb. 18.

Are the above discrepancies typographical errors in the original CAB report, typographical errors in AVIATION WEEK only, or are they an example of the manner in which CAB and CAA operate?

FRANK H. HIGHLEY
R. D. No. 9
North Canton, Ohio

(The Feb. 19 figure mentioned was a typo in AVIATION WEEK. It should have read Feb. 14. All other dates are correct.)

WHAT'S NEW

Telling the Market

Complete line of air cylinders are contained in Bulletin 731 which includes charts, diagrams and photos. Write Lindberg Engineering Co., 2450 W. Hubbard St., Chicago 12, Ill.

Flexible tubing line in diameters from less than 1 in. to 30 in. for portable and semi-permanent ventilation, fume removal, dust collection and materials handling is covered in Catalog C2-3, available from Flexible Tubing Corp., Guilford, Conn.

Mechanical Push-Pull—A Remote Control for Industrial Use is a four-page folder giving design engineers data on performances requirements, typical design information, construction type data, fittings and accessories and actual case histories. Write Simmonds Aeroaccessories, Inc., 105 White Plains Rd., Tarrytown, N. Y.

Two basic types of flexible metal hose and tubing, seamless and strip wound, are covered in Catalog CC-400 from The American Brass Co., American Metal Hose Branch, Waterbury 20, Conn.

Detailed data on South Bend precision lathes, drill presses and shapers are contained in 89-page Catalog 5205 being put out by South Bend Lathe Works, South Bend, 22, Ind.

Various types of fork trucks made by Lewis-Shepard Products, Inc., including hand, electric and hydraulic models are covered in folder available from the firm, Dept. R-1, Watertown, Mass.

Illustrated brochure discussing activities of South Gate Aluminum & Magnesium Co., is offered to prime contractors and other firms needing production of machined parts or non-ferrous, rough and finished castings. Write Nolan K. Ford, sales manager of the firm, at 5331 Tweedy Blvd., South Gate, Calif.

Publications Received

• Aeronautics at the Mid-Century, by Jerome C. Hunsaker, published by Yale University Press, New Haven, Conn., 1952, \$3.00. Views on the past, present and future of aviation and its impact on our civilization; illustrated.

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EDITORIAL

Hot News About Russian Aviation

TO: JOE VAN DENBURG, CHIEF EDITOR, MCGRAW-HILL WORLD NEWS

NAT MCKITTERICK, MCGRAW-HILL WORLD NEWS, LONDON

DAVID ANDERTON, ENGINEERING EDITOR, AVIATION WEEK

Another "hot" Russian aviation story has appeared in a U.S. magazine, purporting to describe two new rocket fighters, with sketches. We didn't have it. Some of our readers are impressed with this material, and the newspaper publicity it won. They are disappointed in AVIATION WEEK.

Should our conservative policy about buying or printing so-called hot material about Russia be changed? On our editorial page July 30, 1951, we told our readers why we were not running many of these "big" Russian air stories. Since early 1950 we had clamped down on such material being offered to us for sale. We pointed out that in our opinion extreme caution was necessary if we were not to be caught playing into the hands of propagandists or certain hungry feature writers.

AVIATION WEEK doesn't wish to underestimate the Russians. Neither do we care to overestimate them, even when we could get good newspaper headlines by taking a chance of doing so. What we are trying to get at is the truth. Have we been too conservative about publishing reports about Russia that come to us? Let me have a memo on the subject. We can always change our policy and print more of the stuff if you feel it is authoritative, and if you can trace its sources to your own satisfaction and ours.

WOOD

* * *

To Wood

Berlin is full of characters who will sell you "inside information" on Russian aviation. Most of them claim to have just fled from the East Zone or Poland. It remains a fact, however, that not even German papers seem to care for this sort of "information."

If a legitimate aviation expert makes his way to the Western Zone, you may be sure our Air Force Intelligence boys (or the British or French) will hustle him to a place where he won't be able to sell his information.

The Russians are quite careful not to expose their new stuff in the Berlin vicinity. I would say that chances, even in Berlin, are thousands to one, against running into a legitimate, documented story on new Russian air developments. Anybody can manufacture a "sketch" of new developments, but I feel we would be wasting our money and time to go into that market; and some of this sort of material might boomerang badly. I think Gerry Schroder in our Frankfurt Bureau would verify the information above.

VAN DENBURG

* * *

To Wood, NEW YORK

I have taken various soundings and come to the following conclusion. If it is your policy to do so, you can get interesting informed guesses, based on the scrappiest information, about Russian aviation developments. In no case at all can stories on Russian air development be displayed as "news" without laying yourself open to ridicule from those who know.

The major source of Russian material here is a syndicate of three individuals, one of whom has just returned from the U. S. Their sources are, for the most part, in Western Germany. Like the child's game of whispering

a story around the room, the final version must inevitably bear little relation to the original.

Here are a few examples:

1. A much vaunted Russian night fighter which was supposed to be going into service turned out to be the ME 262 with wing root turbojets.

2. A project hailed as "Russia's B-36 destroyer" turned out to be nothing more or less than an ME 263 rocket plane of 1945 vintage.

3. In the engine field, while the "hot poop" boys were giving Soviet fighters various hotted-up German jets, what did the MiG-15 types appear with? The much-despised Nene. For some time now, there have been few if any "hot Russian" stories about axial jets!

Some of the stuff is laughably balderdash. Take the case of a satellite country which was said to have developed a warplane of very advanced design. One American magazine reported this as gospel, right down to the alleged designer's name. Unfortunately, his name translated into "pressurized cockpit" and the source of the article was traced back to an Eastern European magazine's April Fool's issue.

On the other hand, I should think some Russian reporting could be handled in AVIATION WEEK. In no case, however, would I think it wise to present the material as "news." Label it speculation with a capital S.

MCKITTERICK

* * *

To Wood

You might be interested in this chronology of a purported Russian six-turboprop bomber, but please eliminate the names of the magazines and the men involved.

1. A U. S. popular magazine publishes an article under the pen name of a man I know. It describes a new Red bomber. Article is illustrated by an artist I know, who worked with his imagination from verbal material from the story. The artist was told that no pictures existed at the time.

2. Foreign magazines publish three-views of a purported Russian six-turboprop bomber featuring a needle-nose like the YB-60 and otherwise similar to the YB-60. These drawings appear in L'Ala (Italian), L'Air (French), Aviation (French), and Alta (Italian). There may have been others.

3. Flugwelt, a German bi-weekly, publishes the three-view, signed by the name of an artist known to me through a German connection. I write the German and ask him to check. He checks, and tells me the drawing originated in a Frankfurt press-agency.

4. Gen. Vandenberg, USAF, speaks publicly about a Soviet turboprop bomber (propaganda?) and the balloon goes up again.

5. The same U. S. popular magazine referred to in Paragraph 1 asks the same artist to make a drawing comparing the latest three-views of the Russian turboprop bomber with this artist's early conception. In the same issue he is to make the same comparison for the YB-60.

6. Artist calls me to ask if there is any new material available on the Russian turboprop bomber, and what can I find out? I tell him I have a contact in Germany who might be able to fill in, and so I write to Germany.

7. German friend contacts press agency and says that drawings there of new Russian turboprop type were taken from my artist friend's earlier work appearing in the U. S. magazine with the article mentioned in Paragraph No. 1.

Thus the wheel swings full circle.

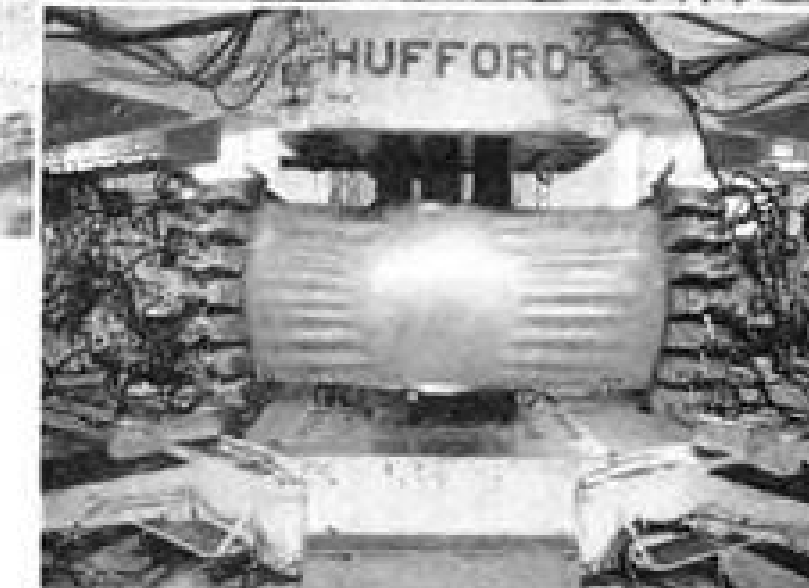
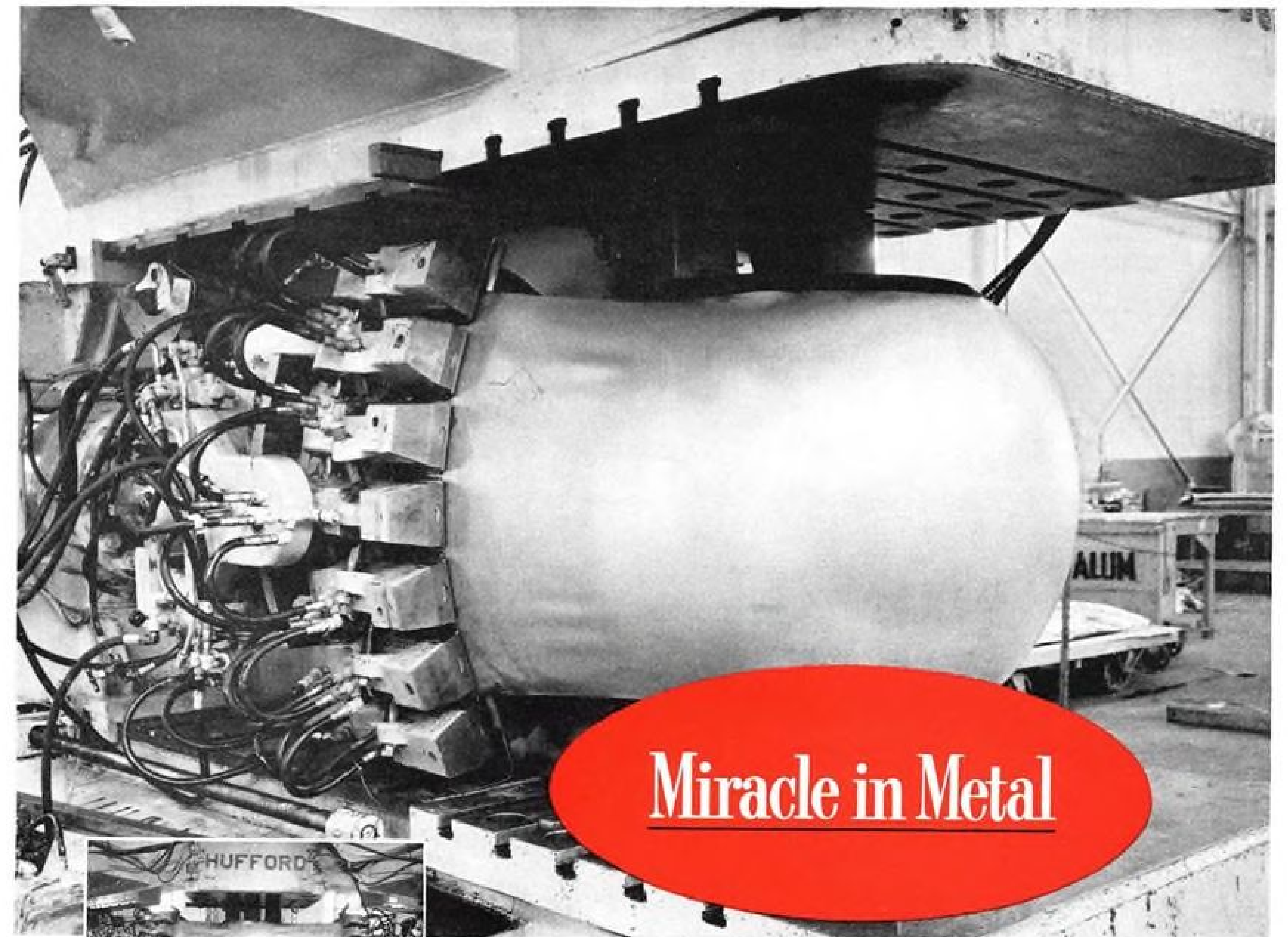
ANDERTON

* * *

TO: VAN DENBURG, MCKITTERICK, ANDERTON

Strict policy on so-called Russian news remains unchanged. Our readers' confidence is more important than free publicity in newspapers over "scoops" we can't trace. Russian material we do print will be filtered, and labeled speculation when that's what it is.

WOOD



TOP—Start of the stretch-wrap forming operation showing jaws curved to match the vertical profile of a spherical die.

BOTTOM—Flexibility and versatility of Hydra-Curve jaws are evident here. Convex, concave and compound die curves are easily matched.

New HYDRA-CURVE JAWS make possible unusually deep curvatures with Hufford Stretch-Wrap Forming

Here's another stretch-wrap forming milestone... successful development of the new Hufford HYDRA-CURVE JAWS! They curve full size sheets to match vertical die profiles before stretch-wrap forming... simplify formation of extreme convexities or concavities.

SAVES HUNDREDS OF DOLLARS DAILY—One plant, using HYDRA-CURVE JAWS, reports material savings alone of \$335 per day... possible because a large surplus of stock between die ends and jaw grippers is no longer required to equalize stresses.

BETTER PARTS—Hydra-curving not only cuts waste, it reduces stresses, prevents tearing and resultant losses, overcomes wrinkling and insures better skin fits which cut assembly time.

DIE COSTS REDUCED—Expensive-to-make dish-outs on dies are no longer required to reduce transitional stresses. These savings are reflected in lower die costs.

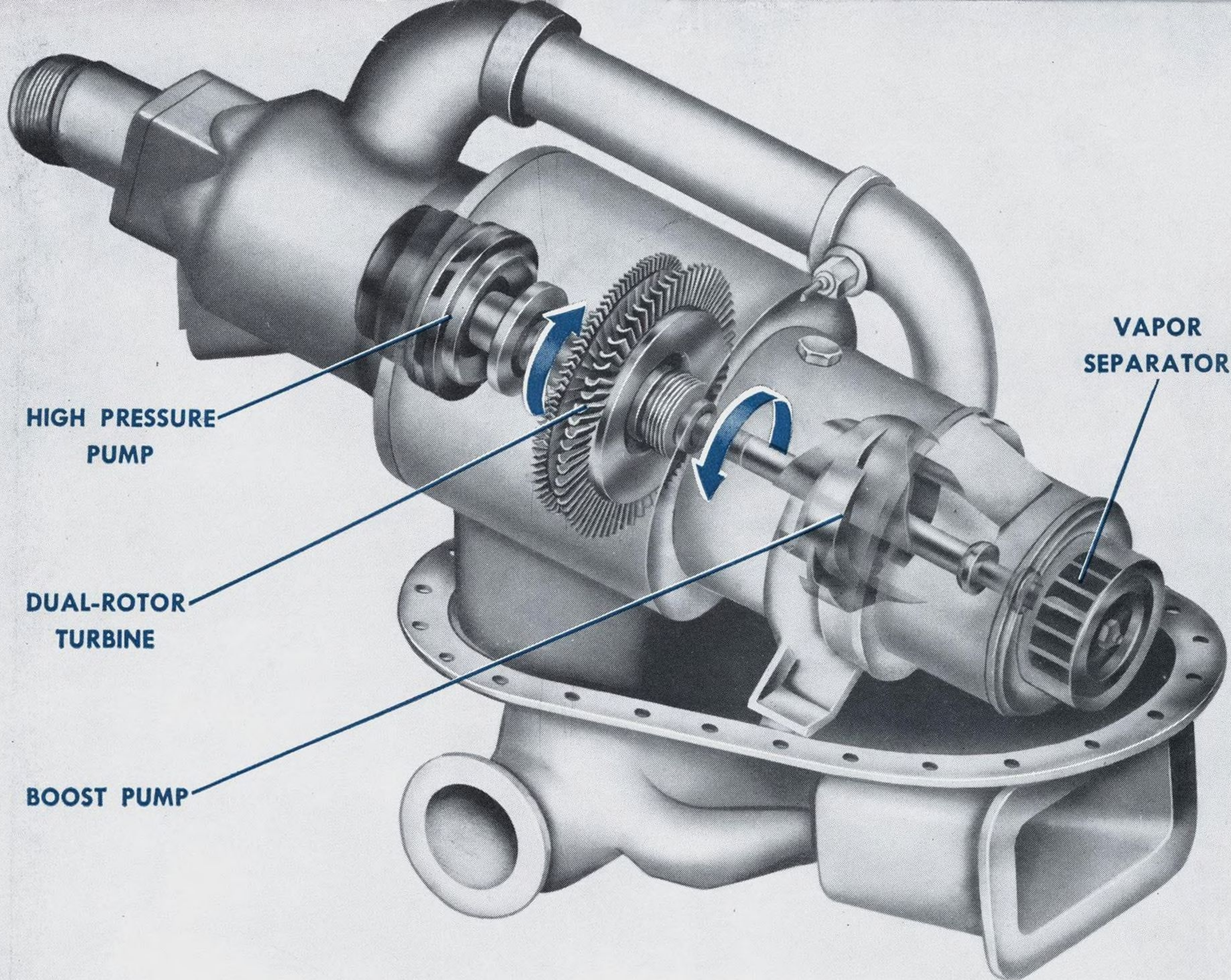
WHY NOT GET THE FACTS ON HUFFORD HYDRA-CURVE JAWS? Here's industry's newest tool for stretch-wrap forming. It's saving money and doing a far better job, too!

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New G-E Afterburner Fuel Pump Saves Pounds, Eliminates System Complexity

3-in-1 Pump Is Light, Compact, Permits Climb Rates of Thousands of Feet Per Minute

To give you maximum efficiency in the smallest possible space, the boost pump, high pressure pump, and vapor separator are all combined in G.E.'s new reheat (afterburner) fuel pump. Because it is mounted in the fuel tank, the pump replaces boost pumps and their associated piping. This not only saves weight, but eliminates system complexity.

A built-in vapor separator permits climb rates of thousands of feet per minute. The pump is capable of delivering 86 gallons of vapor-free fuel every minute at a pressure of 550 psi.

Although operated on bleed-air, the turbo-pump can be turned off while the engine is operating. This eliminates recirculation and its accompanying energy loss.

This pump can also be adapted for pumping various types of liquids to meet other pumping requirements. For information on G-E turbo-pumps contact your nearest General Electric Aviation Specialist or fill out the coupon and send to Section 210-65A, General Electric Company, Schenectady 5, N. Y.

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