Sure footing for the “Cutlass”

Designed to out-fly and out-fight any shipboard jet, the new Chance Vought F7U “Cutlass”—like many of the outstanding aircraft now in production—relies on Goodyear for its main landing equipment.

Distinctive lines and outstanding performance distinguish this latest Navy fighter—just as dependable, sure stops and safe landings mark the performance of Goodyear landing equipment wherever it is used—in commercial applications as well as military.

Write today for further details on Goodyear developments for greater air safety and dependability— including fuel tanks, tires, tubes, wheels, brakes and AIRFOAM Super-Cushioning.

Goodyear, Aviation Products Division
Akron 16, Ohio or Los Angeles 54, California

Airfoam® T. M. The Goodyear Tire & Rubber Company, Akron, Ohio
ZENITH "on the nose"
in the Boeing YB-52

Equipped with eight of the world's most powerful jet engines, the giant YB-52 Boeing Stratofortress bomber is one of the most formidable fighting machines ever to take the air. Contributing to its strength are the fiberglass reinforced plastic nose parts produced by Zenith—engineered to perform, built to withstand the terrific stresses of superjet speed. That's why both aircraft manufacturers and the U.S.A.F. consistently rely on Zenith parts.

For specific information and cooperation in both the civilian and military fields, consult our Engineering Division.

NEW DEPARTURE
BALL BEARINGS

No conversion problem...
in these dual-purpose plants

Jig borers and jets, trucks and tanks, household appliances and electronic instruments, all use New Departure ball bearings of the same materials, same heat treatment, the same methods of precision manufacture.

Thus conversion from one to the other in New Departure's three great plants is largely a matter of changing the emphasis on types and sizes.

The capacity of the world's largest ball bearing plants is your assurance of the best possible production schedules.

New Departure's engineers and vast resources for research are freely at your disposal.

Nothing Rolls Like a Ball...

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BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS CORPORATION • SPRINGFIELD, CONNECTICUT
POWER...to guide the guided missiles...

AiResearch develops a new auxiliary power package!

To be successful a guided missile needs two kinds of power: (1) the power to drive it through the air, (2) auxiliary power to operate its various elements as electrical and electronic guidance, intelligence systems and surface controls.

AiResearch is now producing this secondary power source in the form of a power package not much larger than a milk bottle.

This power package incorporates a 60,000 rpm axial flow turbine, reduction gear box, a 12,000 rpm induction generator and a gear type hydraulic pump.

In operation hot gases burned in a gas generator are expanded through the turbine wheel to produce shaft power. The alternator and hydraulic pump convert shaft power into electrical and hydraulic energy. Performance figures are 2.75 gpm of oil at 2000 psi and 600 watts of 400 cycle, 115/208 volt, 3-phase alternating current.

Since neither brushes nor slip rings are used, this power package is well suited to missile application where large changes of altitude are encountered and where radio noise problems are critical.

Would you like to work with us? Qualified engineers, technicians and skilled craftsmen are needed now at AiResearch in both Los Angeles and Phoenix.

AiResearch Manufacturing Company
A Division of the Garrett Corporation
Los Angeles 40, California -- Phoenix, Arizona

DESIGNER AND MANUFACTURER OF AIRCRAFT EQUIPMENT IN THESE MAJOR CATEGORIES

- Air Conditioning
- Fuel Systems
- Electrical Systems
- ARMAMENT
- AEROSPACE
- Air Transportation
Flying
Tomorrow's
Jets

Sperry gyro engineers are seeking solutions for tomorrow's flight control problems while developing new ways to better the performance of control equipment currently flying.

The analog computer is duplicating flight conditions of a new high-performance jet bomber using "flow" automatically by the Gyroscope flight control. Here, for instance, a Sperry engineer checks the performance of the airplane and automatic pilot during the bombing run.

In test after test—in laboratory and its great Flight Research Center, MacArthur Field, Long Island—Sperry flight controls are continuing to prove their capacity to maintain stable all-weather flight in jet, propeller-driven, rotary-wing, lighter-than-air and pilotless aircraft.

For 40 years Sperry has been working continually on flight control problems. With this wealth of experience to build on, tomorrow's problems are being met by today's research and engineering.

Domestic

Gen. Hoyt Vandenberg, USM Chief of Staff, is encouraging pilots from all branches of the air arm to improve their flight control training. He has stated that Vandenberg's chief concern is to ensure that we have the best trained pilots possible.

Convair B-50s caught fire and was almost completely destroyed while being fueled at Convair's San Diego plant. No one was injured. Salvage is expected to reduce the loss to less than $4.9 million.

William C. (Bill) Hoff died June 14 following a heart attack while at home in Lake Mohawk, N. J. The 38-year-old aviation writer was a member of the Aviation Writers' Assn. 12 years, was formerly with Flying magazine. For the past few years Hoff served as vice-president of Techaircraft, inc., aviation technical manual publishers.

Personal and executive plane shipments during April to six firms totalled $3,349,000.

Ralph E. Bell has been appointed by Boeing Aircraft Co.'s sales and marketing, succeeding Frederick B. Collins, who resigned to take a high position with a Scottie corporation. Bell has been a Boeing sales executive since 1946.

First Goodyear ZPN airship was scheduled to arrive at Lakehurst, N. J. to enable lightest-than-air base last week from Boston port. Airship C. Regency Navy auxiliary aircraft, the ZPN is 324 ft. long, holds 875,000 cu. ft. of gas has two Wright 1310 engines.

Edgar N. Smith, former special assistant to CAA Administrator Charles F. Herme, and with CAA since 1944, has been named Regional Administrator for Region 9 (Pacific Islands) with headquarters in Honolulu. He succeeds W. E. Klein, retired.

Static tests covering more than 100 conditions have been completed on a Northrop F-89 Scorpion all-weather fighter in the Structures Test Laboratory at Wright Air Development Center. Dayton. Design conditions were heated up to 150% of max load that might be expected normally. Critical conditions were tested to destruction.

Douglas DC-7 power packages will be

TWO SOVIET JET BOMBERS buzz the Hille River when from the broadcaster between the Soviet and French sections of Berlin, proving unmistakable close to a group of German barges. This incident preceded the recent seizure of two bodies built by Rohr Aircraft Corp., Chula Vista, Calif. Leader order is for 132 units, adds several million dollars to Rohr's more than $52 million backlog

Active aircraft in U. S. number 34,000 of 1 Jan. 1, with more than 50,000 single-engine types. Three are supersonice 2,700 twin-engine planes active, 346 four-engine and 12 transfer aircraft. Airlines operate 1,333 in addition, CAA has on record 34,000 in service. Figures are reported in new Statistical Study of U.S. Civil Aircraft as of Jan. 1, 1952.

CAB Member Joseph E. Sibert was scheduled to leave Washington last week for a month's official tour of the troubled Alaska air carrier situation. He's due to stop at Seattle this week and reach Alaska the weekend.

Damage suits totaling $75,000 have been filed in an U. S. District Court against TWA and National Airlines Half million-dollar damages are sought by the widow of Conrad Lasho, attorney, killed in the crash of a TWA plane near Fort Worth, Texas. In August, 1950, NAL is bringing suit for $212,000 by the widow of Max L. Field, who died in Feb. 11 crash of a NAL airliner in Eliebets, N. F.

Financial

PuSeca Helicopter Corp., Macomb, Ill., in 1953 recorded sales of $26,366, 572, more than four times 1950's total. Net income for year was $239,550, double as Dec. 31 was $10,250.

Airline Cleaning House, Washington, D.C., reports April billings of $281,117,416, a 210% increase over 1951.

Texas Aircraft Corp., Dallas has deduced a regular quarterly dividend of five cents on capital stock outstanding, payable June 30 to June 30 holders.

International

Two Russian jet fighters reportedly shot down a Swedish Air Force Catalina over the Baltic Sea June 16 while the latter was searching for a missing Swedish military transport plane. The crew of seven was rescued.

Vickers Supernova 508 twin jet naval fighter has earned out carrier oper ative trials aboard HMS Eagle. The type has two Rolls Royce Avons.

Pajot P-I55 has won an Italian Air force competition for turbots powered by Anglem engines (Aviation Week June 9, p. 15). Pajot reportedly is building engines under license.
AVIATION CALENDAR

July 8—American Meteorological Society national meeting, including joint sessions with the Institute of the Astronautical Sciences, Hotel Stoller, Buffalo, N. Y.
July 2-5—Northwestern States Soaring Meet, Eastern Mountains, Ind.
July 2-4—Northwest States Soaring Meet, Grants Pass, Oregon.
July 4-9—Forty-ninth annual meeting of the American Geophysical Union, University of Chicago, N. Y.
July 9-12—Aircraft Airways Assn. annual convention, Ambassador Hotel, Los Angeles.
July 15-18—National Air Traffic Conference, Manhattan Beach, Calif.
July 18-21—Women's Flying Club of America national convention, Chautauqua, N. Y.
July 21-24—Aeroplane Club of America national convention, Westgate Hotel, St. Louis.
July 26-29—Flying in America, Chicago, III.
July 30-Aug. 2—Aeroplane Club of America national convention, Park Hotel, New York.
Aug. 11-15—Aeroplane Club of America national convention, Park Hotel, San Francisco.
Aug. 15-18—Women's Flying Club of America national convention, Alachua Polytechnic Institute, Athens, Ala.
Aug. 22-28—International Air Transport Assn. convention, Aeroplane Club of America, Chicago, III.
Sept. 1-7—Aeroplane Club of America national convention, New York.
Sept. 8-14—Northwest Soaring Meet, Grants Pass, Oregon.
Sept. 15-21—Aeroplane Club of America national convention, Chicago, III.
Sept. 21-27—Aeroplane Club of America national convention, Cleveland, Ohio.

RF NOISE SUPPRESSION FILTERS DESIGNED FOR YOUR SPECIFIC PROBLEM DELIVERED WHEN YOU NEED THEM...

PRIZE HORNS FOR A PERFECT STEER!

AVIATION IN THE NEWS

YF-31 BARED—Demen YF-31 (right), being produced for Army Field Forces, is shown in artist's cutaway which reveals nacelles arrangement for handling four wounded and pilot seated on separate deck. Rear gunner is shown coming out of cutaway for taking out of casualties in flight. With normal equipment the YF-31 climbs over 1,300 fpm.

GROUND STRAWER—Marines Corps Vought AU-1 Corsair (right), was delected to provide more effective ground support in Korea, substituting the earlier F4U model, the AU-1 has had an A-100 engine and fumere, more armor protection added to both infantry and armor ground fire. (Aviation Week Aug. 7, 1952). A long range auxiliary tank under the fuselage permits the new Corsair to speed more kin of support missions.

TINY STUNTER—'Home-made' Geiger Special, small airplane (left), designed by Capt. Gehrke, spans only 36 ft., has 12 ft. wings and weighs 540 lb. empty. Climbing speed is given as 140 and top speed as 170 mph. Named 'Angel Rocket,' the plane is powered by an 85-hp Continental. Wing construction is plywood, fuselage is built of tubing. It is telefooned and reportedly cost $5,200 to build. Present owner, Sherwood F. Cade, was vice president of Young's Flying Service, Cape May County Airport, N. J., is asking $1,500 for the plane.

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### Remington Rand Methods News

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**Does your COSTING cost you too much?**

Cost accounting can be easily ruined if your reports are late, incomplete, inaccurate, or consumed too much clerical time in gathering and analyzing data.

Let us show you how one plant, with little extra effort, gets complete distributions of all direct and indirect labor. This includes proration and fixed time on each job. Their prompt reports show labor, material, burden, total cost, and the difference between actual and standard costs. Other by-products of these practical punched-card methods are rework and spoilage reports by employee, improved control of materials inventory, faster payrolls with bonus earnings. Ask for illustrated case history folder SN-778.

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**Tackling the problem of payroll peaks**

There is one firm we know which has practically wiped out overtime and cut costs for payroll processing. To do this, they spent years developing better procedures and a smoother work flow.

During this careful study, Remington Rand payroll machines were chosen to replace others previously used. They used the machine which fits in the work the best: (a) complete visibility of the working line as a great aid to speed, (b) ability to get all the columns automatically needed on each payroll, (c) versatile permitting use of machine for different services, or only one key board simplicity which enabled them to make competent operators quickly use of typists' work unsaved and easily trained.

Let us show you more reasons why Remington Rand machines produce payroll checks pay faster. Ask for leaflet AB-448 and AB 502.

For information, please request literature from Remington Rand Equipment Center in your city, or write to our Management Controls Reference Library, 31 Fifth Avenue, New York 10, N. Y.

### INDUSTRY OBSERVER

- **Vickers-Armstrong, Ltd. now has 34 orders for Vickers turboprop transports Australian National 6, Trans-Atlantic 6, Aer Lingus 4, Air France 12 and BEA 35. Company will have capacity to turn out four to six Vigrants a month by the end of 1953. First production model will be delivered to BEA next October.**

- **De Havilland has six new firm orders for Comets, making a total of 51. Recent additions haven't been announced, but it is a good bet the buyers are Australians.**

- **Despite some military and industry thinking to the contrary, USAF's Office of Flying Safety reports the Corrigan C-36 has one of the lowest accident rates established by any type since the bomber made its first flight in 1946. Indeed, it is even more significant when it is recalled that it was and is the largest operational plane built, and that it went into production without the usual months of flight testing and evaluation, OOSates.**

- **Effects of heat on nylon webbing are beginning to be of considerable concern to the Air Force as speeds move into supersonic range. Weapons Components div, Wright Air Development Center, reports that nylon will burn yellow after exposure to 300°F, 5 sec will melt at 462°F, and burn at 587°F. When heated for 30 min, at 590°F, it has 90% of its strength.**

- **Wright R1330 engine, rated at 800 hp, is being groomed as the power plant in a new version of the Sikorsky H-19 Air Force helicopter, which now works out of San Diego. Wright engine now has a record of more than 15,500 flight hr in two years of military operations in North American T-28 trainers.**

- **New military requirements for turbojet engine preliminary flight testing will have repercussions on demonstration of engine safety for flight, rather than the usual endurance demonstration, it recommendations of U.S. manufacturers to the military are followed.**

- **Small boats in small plane civil orders continues, with both Cessa and Piper stepping up production schedules of their four-place to take case of increased orders.**

- **McDonnell Corp plans to get its first MC-46 production civil helicopter completed in July from its unlined military and civil production. Navy gets first two in June, Army gets one in July and two in August.**

- **CAA has decided that the federal mechanism rating is no longer necessary and has deleted it from CAA Part 2 (June 15 revision). Decision is based on the fact that CAA Part 19 handles a manufacturer to rebuild or alter products for which he holds a type or production certificate that was issued to a manufacturer or to rebuild or alter products for which he holds a type or production certificate that was issued to a manufacturer or to rebuild or alter products for which he holds a type or production certificate that was issued to a manufacturer.**

- **There is infinite speculation that the Beech Aircraft entry in the forthcoming jet trainer TC competition will resemble more than a little the twice previous entry almost certainly Beech design engineer R. M. Henson has a recent 34k paper at Washington, D. C. (Aviation Week May 24, 14).**

- **Now disclosed was the widely distributed Pratt & Whitney R-2800 engine, rated at 2,400 hp, will be the new Sikorsky S-56 twin-engine helicopter. Nine contracts will be awarded by the Navy for the S-56, with the Sikorsky S-56 will have more power than any U.S. piston engine helicopter yet disclosed. Its nearest competitor is the big Air Force Xfus 114, 5, fitted with two F1-2800 engines which have at 2,600 hp each and the Bell 4551, 1,550 hp each, and the Bell 4551.**

**AVIATION WEEK, June 23, 1953**
Showdown Near on Air Power Stretcher

Air Power Funds for Fiscal 1952 ($8 Millions)

<table>
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<tr>
<th>Carrying Funds</th>
<th>Obligations As of</th>
<th>Carry-</th>
<th>Reoffs</th>
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<tr>
<td>USAF</td>
<td>May 1</td>
<td>Over</td>
<td>Over</td>
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<tr>
<td>Air lift and Related Enforcement</td>
<td>199</td>
<td>11,200</td>
<td>7,176</td>
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</tbody>
</table>

Navy Construction of Aircraft and Related Procurement 3,000 3,000 800 None
Source: Department of Defense

Two Are Convicted

The Senate showdown on coming year's funds for aircraft, probably this week, was preceded last week by the Senate F-95 subcommittee's report urging that "overestimating" might be a quick loan of a top government officials.

The committee which is headed by Sen. Lloyd Johnson, made these assertions.

The question of an adequate defense for these United States is a question of life or death for ourselves and our allies.

Our leaders believe that our defense is not adequate and are not on the road to adequacy.

The figures on our aircraft inventories at the start of the Korean war and at the end are as follows:

1951: 193,000
1954: 193,000

We have consumed the best estimates of Soviet production and capability for production. The board is shocking.

No victory is in the cards as long as the Soviets hold off an air threat to us as we have done today.

May 6, 1952, 8:30 a.m.

Air Force preparation—At this late date it is imperative that the schedule which would have permitted at-turnaround of our F-95s and F-86s necessary in 1954 can be accelerated, but everything must be done to take us out of production to a point where we can reach in the quality of production the strength requirements.

New Chief of Staff

Reducing the total number of planes to be produced annually under the long-term budget will increase the unit cost per plane by 25 to 30%.

The overall cost of developing the F-95 for Air Force plus the additional requirement of the Air National Guard will cost $315 million, the amount which puts them in the $300 million dollar class.

Basing planes on the new F-95 will save money on the labor, and, in effect, cut the unit cost per plane by 25 to 30%.

Two men have been convicted of violation of the aircraft control laws.

The goal we set in 1954 called for a 95,000 Air Force by mid-year 1952. Now, one of these men was actually working with this goal, the other was the major of the aircraft control laws.

The F-94 production ceiling on the number of planes being built was set at 6,000 per year.

The $16 million ceiling on defense expenditures has been reduced by the House to a limit of $7 million, which means the Air Force has agreed to go ahead with the production of 640 aircraft.

F-86F Sabres Delivered

First group of F-86Fs Sabres set for delivery has been delivered to the 896th Fighter Interceptor Wing at Los Angeles, Calif. The F-86F's 47th CF, 27, is now in production at St. Louis.

The Sabre engine in stalled in cold weather F-87E

Charges Against K-F Retracted

Rep. O'Konski says Kaiser's remarks must be taken to mean that no funds were used in contingency for K-F planes that were not awarded to K-F, but this is incorrect.

The court was asked to endorse the charges against K-F. The judge found that the charges were true and that the funds were used in this manner.

President Truman called the charges "very serious" and that Kaiser's remarks must be taken to mean that no funds were used in contingency for K-F planes that were not awarded to K-F, but this is incorrect.

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Foreign Buying

- Hague report says U. S. to buy Europe's planes.
- Defense, MSA differ on when it will start.

Defence of opposition to how close the proposed purchase of European military aircraft by the U. S. is to reality was Washington last week. Some top Defense Department officials called the recent disclosure by the State Department that the U. S. expects to purchase a complete line of Avro-manufactured military planes and complete fighter planes from Avro manufacturers "untrue" and completely premature.

To put such plans in motion immediately, three officials said would only result in the aircraft program now just getting underway in the U. S. They insisted, so the strictest and most complete supply of machine tools and construction programs for France and some critical materials, and the surplus to Congress as to how many dollars can be invested in U.S. defense.

The key is in the U.S. trade with France, the capital available in the new government's defense budget, it adds, and the potential it may have for a future military base in the United States.

Chief objection to this plan by French authorities is that while the U.S. cannot defend itself in the production of military aircraft, the U. S. can. In other words, there is no need to defend the U.S. if the military does not want it.

Note: The new aircraft will be purchased by the United States through a joint venture with France, the capital available in the new government's defense budget, it adds, and the potential it may have for a future military base in the United States.

FOWL-WEATHERED

This is what happened in a Canberra getting driven by a storm and losing its pilot in a crash. The Canberra was damaged beyond repair. The plane landed safely.

100 Million Daily

- That is present spending rate for AF, Navy planes.
- But it is just to clear '52 funds before June 30.

By Alexander Mezvinsky

Air Force and Navy Aircraft procurement officers have been pushing aircraft orders at a rate of about $50 million a day for the last two months in an effort to complete their 1952 fiscal year procurement.

The Navy has been able to get a carryover of $55 million from last year. Meanwhile, the U. S. Air Force still had $1.2 billion in obligational authority for aircraft and related procurement, while the funds have not been fully used.

NSAP was held to be a single obligation to the Air Force, which would occasion some concern in the Air Force, particularly as the Navy can also use its funds for the purchase of aircraft and related equipment.

Estimates on June 30 showed that both sides expected to absorb all the money in the remaining two months.

However, a more recent USDA study shows that approximately $1.6 billion was spent on aircraft in the first three months of the fiscal year, but the figure is not comparable.

Another note: It is estimated that the U. S. will spend $1 billion in aircraft procurement in 1952, a figure which is not comparable to the $55 million carryover.

Military

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AF vs. Saucers

Stories of new sightings bring fresh denials.

But AF has new camera ready to shoot on sight.

By Ben S. Lee

Recent revival of flying saucer sightings-analyses which have appeared in popular nationally distributed magazines, and a new development by a magazine which is seeking to give the press a new perspective on the phenomenon-continue to be regarded by some as a serious threat to the public. In the past, the public has been accustomed to accepting the reports of the phenomenon without question. But with the recent revival of interest, there is a growing recognition that the reports cannot be explained by conventional means.

The phenomenon has been studied by various organizations, including the U.S. Air Force, the FBI, and the CIA. The results of these studies have been conflicting, and there is still no consensus on the nature of the phenomenon. It is generally agreed that the reports are not due to natural objects, such as comets or meteors, and that they are not due to man-made objects, such as airplanes or weather balloons.

The AF has recently announced the development of a new camera, the Evaporator, which it claims can photograph the phenomenon. The camera is based on the principle that the phenomenon is caused by the interaction of light and matter. The AF has claimed that the camera can produce images that are clearer and more detailed than those produced by existing cameras.

The AF has also announced that it will be conducting a series of experiments to test the effectiveness of the camera. The experiments will involve the use of the camera to photograph the phenomenon in a variety of conditions, including different weather conditions and different times of the day.

The AF's decision to develop a new camera has been met with skepticism by some, who believe that the phenomenon is not real and that the AF is simply trying to create a new technology to sell to the public. However, the AF has argued that the phenomenon is real and that the new camera is necessary to begin to understand it.

The AF has been criticized for its lack of transparency in its investigation of the phenomenon. The AF has been accused of using the phenomenon as a cover for other, more secret activities, such as the development of new weapons technologies.

Despite these criticisms, the AF remains committed to investigating the phenomenon and to developing technology to understand it. The AF has stated that it will continue to work on the phenomenon until it is able to conclusively prove or disprove its existence.
Newark Field Gets Second Chance

Big eastern base open to traffic, but restrictions continue to block some flights.

Port of New York Authority opened controversial Newark Airport to the airlines on a limited basis beginning June 16 after approximately a month's shutdown, but for the first few days only one activity was visible—landings by private planes and housekeeping duties performed by grounds crews. It was good to believe Newark, formerly one of the world's busiest terminals, would agree become a major base in the East on opening of its new instrument runway, scheduled for early November. Severely restricted operations were the major reason for seeming apathy of the nearly two-dozen scheduled and unscheduled former carriers. It also appeared that the carriers may have been cautious with their plans down.

Civil Defense on Runway 24 toward Elizabeth or on 25 toward Newark.

No landings on Runway 6 (from the direction of Elizabeth).

Operations permitted day and night, but only on approach when ceiling and visibility are 1,000 feet and three miles.

In addition CAA has had the legal runway priority system in Newark on the morning's starting back on the 24th.

Takeoffs Priority 1, Runway 10, Priority 2, Runway 6, Landings Priority 1, Runway 25 Priority 2, Runway 24 Priority 3, Runway 24, Priority 3, Runway 24 Runway 10. These priorities will be reviewed when the new instrument runway opens 22 opens, with performances probably allowed otherwise.

Takeoffs Priority 1 to the north on Runway 22, Priority 2, to the east on Runway 10, Priority 3, to the north on Runway 4, Priority 4, to the west on Runway 10.

Landings Priority 1, from the south on Runway 4, Priority 2, from the east on Runway 28 Priority 3, from the west on Runway 22, and Priority 4, from the west on Runway 10.

Although Runway 10 is open at present for landing from the direction of Newark, its low-power rating as a result of several inches.

With Runway 23-30 out for landings, the airport was oriented toward that city, Newark is left without an instrument runway until the new strip opens in November. Thus the ceiling and visibility rule now in effect. And CAA has gone on record as saying it will strictly enforce operations.

May Ask Imposition—Although a formal letter representing seven state and local airport authorities and the Pennsylvania National Guard that it would seek an injunction should the Authority approve the airport's reopening, there was no action along these lines early last week.

An early check of the carriers concerned indicated that the total Newark schedules probably will not go above 10% of the approximately 100 movements scheduled shortly before the port was closed, with the new instrument runway opens. For the most part they were busy studying weather records in an attempt to calculate what schedules they could forecast under the limitations before enforcing. Many carriers noted that the freight carriers were not restrictions to set up duplicate facilities, as many of them couldn't use Newark when the weather killed operations.

Although some still believe Newark will be the best locale for conducting freight operations because of its closeness to a busy industrial area, others are busy with the $1 million cargo facilities set up by PAN Am at tides. Because of the freighters at Idlewild, it seemed to be that this field could supplement Newark as an operating center. Some of the carriers are already operating out of Teterboro and they would like to get back in Newark.

Civil Doman Outpost Assured

While Newark Field gets an opening second chance, Newark's Department of Air Traffic Control was busy setting the scene for the opening.

Dornn Helicopters, Inc., Doman, is one of the companies that has received a license to operate, and it is expected to be the first to make use of the new instrument runway. Doman is planning to begin operations within the next few weeks.

Civil Doman Outpost Assured

Three years in the making, the fabricated jet engine compressor stator blade (left) promises to save the armed forces not just one million, but millions of dollars annually in jet engine costs, compared with the forged blade (right). This new G-E development will cut manufacturing costs in half and save over a third in critical materials. Military approval has been received for the use of fabricated blades in the General Electric J-7 GE-23 which powers the Boeing B-47 Stratotanker bomber. And G-E, through the United States Air Force, is sharing the process with other turbojet manufacturers.

The blades are rolled in long strips, contoured to the proper airfoil, and cut to desired length. Each blade is then welded into a separate base which fills the same area as the "blade ring" used with forged blades. Thus the ring and an expensive manufacturing and assembly sequence has been eliminated.

Endurance tests on two engines equipped with the fabricated blades proved them just as efficient as forged blades. The blade can be guaranteed to last 250 hours under severe conditions. The new blade is fabricated less than 50% as much as the cost of the forging process.

A product of G-E research at the Laboratory at Lynn, Mass., this new method of manufacturing stator blades replaces the many ways in which G-E's constant pressure maintains the advance of aviation. General Electric, Schenectady, N. Y.

Which One Will Save a Million Dollars?
Executive Transportation at its Finest!

The De Haviland "Dove" has proven itself to be the "top brass" in its class. It has given six pound owners (almost 500 of them) many hundreds of thousands of miles of safe, low-cost, comfortable transportation service. No other airplane can boast of so many fine features which add to the comfort, safety, ease of operation and over-all performance, both on the ground and in the air as the "Dove".

Gordon Air Service is a franchised regional distributor of the "Dove", and has had direct working experience with the aircraft since 1948. Therefore we can guarantee that the "Dove" will deliver top performance per mile, after air-mile, after air-mile.

A good supply of replacement parts and accessories are carried in stock, and expert maintenance service is available at Pontiac Municipal Airport, Pontiac, Michigan and all well equipped airports.

Factory-trained De Haviland service representatives are on call at a moment's notice.

The handy location of De Haviland Aircraft Co., Ltd., Toronto, Canada, (just across the border, as the "Dove" does) assures an ample supply of parts and equipment readily available.

Here are a few of the "Dove's" Fine Features:

- Low landing cost
- Low service level
- Low maintenance cost
- Tri-side loading gear
- 180 mph true cruising speed, at 60% power
- Hydraulically self-actuating propeller
- Automatic brake control
- 1,400 mile still-air range

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Forrestal Center to Study Fundamentals

Research hub will delve intensively into studies of flow, aeronautical engineering and flight problems.

By David A. Anderton

Princeton, N. J.—Basic student in flow sciences and aeronautical engineering top the program list at the James Forrestal Research Center of Princeton University, which was dedicated last week.

The broadest concept of the Center defines its use "... for the advancement of science and engineering and the high-level training of workers in these fields."

Within that general outline lie four major efforts in aeronautics and aeronautical engineering research centers in the fields of thermodynamics, fluid mechanics and combustion. The relative effort going toward these subjects underscores the current importance of flight problems in the over-all scientific scheme.

- Progress Report—The Center comprises 500 acres of land and the laboratory buildings which were former property of the Rockefeller Institute for Medical Research. In the 18 months since the first announcement of the establishment of the Center at Princeton, four lines of endeavor have been pursued.
- Conversion and development of the laboratory buildings.
- Organization of the first group of...
LOCKHEED

SUPER CONSTELLATIONS TO GET TURBO-PROPS

The U.S. Navy has selected the new R70J Super Constellation as ideally designed for vital conversion to turbo prop power. Only minor modifications are required, according to Lockheed. No structural changes of the empennage, fuselage or wing are necessary.

Significance to airplane operators is that Super Constellation with Wright 3250 h.p. compound engines can later be converted to turbo props. This conversion to Pratt & Whitney T 34 Turbo Wasp engines will put the Super Constellation in the 450 mile-hour class.

The Super Constellation offers any airplane operator any performance he desires, from high density coast travel, to luxury ocean travel, or even, if used efficiently, economical cargo purposes.

Never before has the basic structure of any aircraft provided so adequately for growth so that acquiring the operator many years of competitive performance. Compared with any of today's certified aircraft, the new Super Constellation is superior in all respects, speed, payload, range and ability to earn greater profit contributating the airplanes used to train the world's finest jet pilots.

NEWS NOTES FROM LOCKHEED

Eight international airlines have now ordered Super Constellations--most recently, Air France, KLM, Air France, S.A.P.E. and British Airways. In addition, the total demand now exceeds 500. A new "White Horse Squadron" of Lockheed F-94 Star Fighters is being delivered to Washington, D.C. The U.S. Air Force, B-29, is equipped to operate in all different kinds of power, including reciprocating engine, jet prop, rocket and gas--all for piloting equipment to to the Lockheed T 33 jet trainer is now more than 500 miles per hour. The 3800-h.p. Pratt & Whitney T 34 turbo prop engine is now available in both fixed- and variable-pitch models.

Flight research, for boundary-layer control and stall-suppression systems.

Helmets, particularly control and stability studies with correlation behavior, model tests and full-scale flight tests. The new T-33A consultant aircraft is located at both the Farnborough campus and the Connecticut, this summer should see the in-flight test program moved to the Research Center.

Many of the jet propulsion tests were sponsored by the three major contracts to be concluded in the Farnborough Center and the falling of the jet propulsion program is one of the functions of this kind. The "spiral" flow--the main field of effort in superconductivity--can be turned into a jet flow pattern, according to Reynolds number. These "bee" changes--caused by variations in scale and geometry--which are naturally correlated in the Reynolds number parameter--have been considered to be the largest single remaining obstacle to the way of understanding superconductivity flows.

The attack on this problem has been two-pronged, by theoretical studies and supporting tests in the Center's wind tunnels. These tunnels are three in number--two are superconductive (one was a scale model for the other, but has since been converted into an equally useful lab tract, and one is hyperconductive). Their chief advantage in the high test section pressure available, which means that the range of test Reynolds numbers can be very large. The tunnels are all blowdown type, and blowdown goes to the atmosphere pressure. Storage at this is at 3,500 psi in turbo charging tanks.

One of the Princeton teams, searching for ideas for high strength, taking thought of large-caliber gun powder. After a bit of correspondence, the Naval Gun Factory came through with a section of the barrel of a 20-millimeter weapon, which was large enough--and strong enough--for the supersonic wind tunnel.

Another sample solution to a complex problem came from the high noise level in the operation of the tunnels. Various kinds of ray protection have been developed at the many wind tunnel and combustion facilities throughout the country. The Princeton group found its best solution in the modifications of standard Navy radio headsets.

Normally these sets have a molded, one piece shell of foam rubber, to which were added additional sheet foam rubber packing and a head ring which fits against the wearer's head and anchors the eartips. These hose-mate-type attenuate the noise from the tunnel, but below a bothersome level.

An interesting development in the group's use of man's hair stock is the raw material for wind tunnel models. Local for models has several advantages. It wears better in the aborning strain than either steel or brass, it is easier to bend and work, which means smaller models. Nylon has lower heat capacity than steel--it doesn't heat up as fast in the tunnel. During tests and therefore takes less time to cool, reducing the time required for readout.

High temperatures cause changes--caused by variations in scale and geometry--which are naturally correlated in the Reynolds number parameter--have been considered to be the largest single remaining obstacle to the way of understanding superconductivity flows.
In equipment But, Utica MAKERS forging. The constant using of modern tools—automated and computerized—such as are found in factories or the directed rocket.
The directed rocket is a powerplant of great promise for certain classes of supersonic airplanes. It is a combination of the ramjet and rocket motors in which the rocket is placed inside the ramjet. The rocket functions as an ejector for the low-speed range of operations and also serves as a thruster for the ramjet. The rocket motor typically blocks off about 10% of the ramjet cross-sectional area.
New test facilities for rocket motor studies have recently been completed and are about to be equipped and instrumented. Rocket motor firings will take place in two test houses which share a common control room between them. All instrumentation is remotely read and recorded in a building located nearby.

Flight Research—Eighty acres of pasture land has been converted to a flight test area adjacent to the Forrestal Center. There are currently two Navions—one North American and one Ryan—being used in the flight research program.
The completion of a cinder block building—new about half done—will permit the Center to house a larger number of aircraft types. In the offering are a twin-engined Beech and a helicopter which, with the two Navions, will represent a versatile and economical fleet of test planes.

When the Center's boundary-layer control program has completed its theory and windtunnel test phases, flight test work will be done at the air strip on one of the Center's aircraft. Another continuing and important part of the flight program is the testing of Air Force engineering test pilots in cooperation with the Air Force Institute of Technology. The service personnel have the chance to combine the theory and practice of test flying, in addition, they get intense specialized training in the classroom.

Rotary-Wing Craft—Another planned use for the flight research facility will be full scale tests on helicopters. The Center's programe for rotary wing craft now combines theory and model tests, and the only remaining step is flight tests of the large craft. With these three phases of the program completed, the Center will have valuable information for correlating these basic tests on helicopter problems.
The model test facility for helicopters is a different approach than used by most researchers on the subject. Instead of a complete dynamically sim...
Fastener Problem of the Month

Helicopter Door Handle June 1952

PROBLEM: Schweizer Aircraft Corporation, builders of Bell 47D1 helicopters, encountered previously used a countersunk screw to attach an aluminum door handle to a steel latch shaft. Costly countersinking and tapping operations were necessary. In addition, accumulated tolerances resulted in an undesirable degree of "play" in the handles. As a result, Schweizer engineers sought a more satisfactory and economical fastening method.

SOLUTION: Self-locking ESNA Rollpins proved to be the fasteners that Schweizer required. Rollpins are pressed-fit, slotted tubular steel pins with chamfered ends. Installation is quick and easy— they are simply driven into holes drilled to normal production tolerances. No extra operations are required. Rollpins hold fast—vibration-proof—because of the constant tension they exert against the hole walls. They are readily removable when necessary—and removable. Schweizer reports that the use of Rollpins on this application has cut assembly costs, and provided a more secure attachment, with handle "play" eliminated.

ROLLPINS are proving themselves as the most practical and economical fasteners for a tremendous variety of applications. Mail one coupon for the design information you will need to solve your next fastening problem.

Rollpin a wide variety of lengths and diameters

---

On the Piasecki "HUP"

Attended to aircraft carriers, Piaseckis helicots can now land neatly on takeoff rails and landings, ready to resume combat flights almost into the sea.

It's Wickwire Aircraft Control Cable

In an era of supersonic jet speeds, the relatively slow-moving but ever-handly helicopter has captured the imagination with its sensational rescue and evacuation of casualties in Korea.

Pointing up the rapid advances being made in design and utility of rotary-winged aircraft is the new tandem-rotored Piasecki helicopter. On the Piasecki "HUP", as on so many other types of planes, reliable Wickwire Aircraft Control Cable has been selected for all-important controls.

Whatever your particular needs may be, we can supply you with Wickwire Aircraft Control Cable in the right size and construction for planes of all types and sizes. For your greater convenience, Air Associates, Inc. maintains full stocks of Wickwire Aircraft Control Cable in their own and CF&I warehouses. See list of cities below.

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Look for the yellow triangle on the reel

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Aviation Week, June 23, 1952
FACTS OF THE AIR: Fulton "H-13D" Rotor Hub

Fulton has designed a unique transmission for the new H-13D Rotor Hub. This hub is particularly suited for light aircraft and helicopters where a precise control of the main rotor shaft is required. The H-13D Rotor Hub is a direct descendant of the Fulton Airphibian transmission, which has been proven highly reliable in various applications.

Tail Rotor of the Bell H-13D: Tails are made of tubing and tubing surfaces. Tubes are simply supported and the part of the rear fuselage is made of straight, smooth, accessibility for ease of maintenance is outstanding. Note the simple design for protecting anti-torque motions in event of tail striking ground.

Dive Brakes for Douglas F3D-2 Skyknight are open and fully extended. By long travel hydraulic cylinders, located on the horizontal tail, these brakes serve for drag control during approach as well as during ascent. The design allows easy identification when brakes are extended.

AIRPHIBIAN automobile component transmits control motions to airplane portion through direct pushrod action to serial rods in plane afterbody.

H-13D Rotor Hub shows standard Bell design of gear and blade and the sliding bar on an U. S. Army's combat evacuation copter.

POWERPLANT of Ap 1 spruce de-icers in Continental I-225 mounted for wind fan possible future replacement with large engine

Triplet exhaust stacks are unusual feature on Texas A&M monoplane.

Things You May Have Missed at SAE Show

About a score of America's military and civil planes and helicopters were lined up for closeup inspection at N. Y. International Airport (Idlewild) during the recent air display sponsored by the Society of Automotive Engineers at its National Aeronautical Meeting.

Closeup is the right word—everywhere there were people bent over to look at the underbelly of a fighter, squatting under the wheel wells, standing on tiptoe to peer into a jet tailpipe.

But often in displays of this type, visitors come away with the feeling that they haven't seen the trees for the forest.

These photos taken for Aviation Week point out some of the features that may have been missed, the unusual ventral way that Fulton transmits control forces from the automobile half to the airplane half of his Airphibian, the maze of tubing and tubing surfaces at the tail of Bell's functional copter, the H-13D, the new look in external packages along under the wing of the Douglas Skyknight, among others—DAA.

NEW PACKAGE for external stores is that elongated "nose" shape shown under the stub wing of the Douglas F3D-2 Skyknight. Douglas developed the form in order to carry fuel in constantly external on jet fighters without a large penalty of increased drag.
As he talked, he leaned, grey-haired Seat sketched valve mechanisms on a scratch pad. It was unconscious doodling, typical of Don McLean's obsession with the challenges of engineering intrigue.

Executive vice-president of the Wm. R. Whittaker Co., Ltd., and a private pilot when he has the time, Don directs the multifaceted operations of the Southern California valve concern, with quiet mienness on original thinking.

"We are in a fast-moving business of specialized products engineered for precision in advance of other users," he said. "It's a daily thing to stay abreast of changing shortages and power plant designs."

Don, the son of a farm-machinery dealer, has spent most of his 50 years in mechanics. He started at 14 when he took over his brother's garage during World War I. An engineering success, he says, trees, shops, and exits engineering. Don recognizes what he produces, something most alludes to his home machine shop.

Don's specialties—sectors and actuators—played a large part in uniting the Whittaker Company into a $10,000,000 busying business. He first worked with Bob Whittaker as a consulting engineer. It was he who designed the sector-actuator for the original Whittaker (B-26) valve that replaced the old-time solenoid and nonautomatic-draft-off valves.

Both Whittaker and McLean foresaw the importance of developing valves and motor-actuators as integrated units. From this realization stems Don's affinity with the company. Whittaker's entry into the motor-operated field and development of the revolutionary motor-operated valve that completely changed the industry's thinking in respect to fuel shutoff equipment.

"Today we have a three-way operation at Whittaker," Don explains. "We produce the standard valves we have built for years, turn out our newly designed valves and work on designs for the future. Standard valves are produced by turning the crank, as to speak. New valves bring tough problems of modification and machine shortfalls but the development designs are the real headliners.

"We must follow all prototype de signs so to channel our efforts in the most vital directions. We've got to be flexible for there is a matter of from six months to a year and from $100,000 to $500,000 involved in such production."

"Test loop equipment involves costly gauging (usually made before we know a valve will go into quantity production). This calls for system design, since we obviously can't run a jet engine in and day out in determining performance under critical situations, temperature and pressure conditions."

"Manufacturing a single two pound valve unit calls for a multitude of operations and the integration of some 300 parts. Frequently the process requires our own development of expensive special manufacturing equipment."

"We are usually asked to do 100 percent of what we can do—and we always try to meet that rate of 100 percent. Sometimes we fail of course. It's a battle of compromise to hold reliability and safety into lightweight products. There are changes, modifications, new facts and when a valve is ready for production, it little resembles the original conception.

"By the time our program coaches production new designs are on the drawing boards, under development or in fact entirely new ideas are always being called for. We never catch up with ourselves."

"Aircraft valves, Don says, are steadily growing more and more complex. Jet engine units (now 10 percent of Whittaker's business) and particularly muscle valves are adding a multitude of elements in metalurgy and tolerances.

"It's an engineer's day," the tall Seat remarked, "but Whittaker recognizes it. One out of every ten people is an engineer—and these 150 men deserve plenty of credit."

Canada Lab Analyzes Jet Transports

Aerodynamics Laboratory of Canada's National Aeronautical Establishment has come up with an interesting study of jet transports.

Results of an investigation recently conducted at the laboratory show an optimum design configuration for a specified cruising speed of 550 mph with four turboprops, each delivering 6,900 lb. sea level static thrust. And curiously enough the design layout resembles the de Havilland Comet.

"No Optimum—"No single propulsion will emerge as the answer to every need," says the NAE study. "And to back this up a graph is plotted against speed and marked with areas of economical operation for piston engines, turboprops, and turbos. These three overlap to a large degree, indicative of the list of professional agreement which still exists."

NAE made an investigation of both types of jet propulsion and concluded it could achieve 400 mph about the top cruising speed for the turboprop

HERE'S AN IDEA that saves hours of time! Frequently, top pressure plates on forming dies are bolted to place. Nuts must be loosened and tightened each time the work is shifted or removed from the die. A full day's operation means a double time loss just tightening and loosening nuts.

Top clamping cylinders on the Huffman bulldozer dispense with this waste. The cylinders act instantly securing the top die plate in place and overcoming die-setting release, and the top plate is fixed for easy workpiece removal. The entire overhead unit may be removed for conventional bulldozer.

Automatic stroke limiter automatically holds horizontal pressing even at any set position. Settings may be rapidly approximated with the motor driven, lead screw type stopper rod. Final micrometer settings are by graduated hand-wheel.

Bulldog position indicator continuously shows ram position to .010" from desired starting position.

Instant-Acting Hydraulic Clamps

Eliminates die pressure plate bolts!
How to Help a Fighter Roll with the Punch

When the Air Force's fastest fighter—the North American Sabre Jet—lands, the landing gear wheels take an awful wallop. But high speed and hard impact don't make this ship. The main wheels roll with the punch on Timken® tapered roller bearings. And Timken bearings are used in the nose wheel.

Line contact between rollers and races gives Timken bearings extra load-carrying capacity. Tapered construction lets them carry both radial and thrust loads in any combination.

True rolling motion and incredibly smooth surface make practically eliminate friction. Their special analysis Timken steel is case hardened for exceptional resistance to shock loads and wear.

Wear and maintenance costs are cut, life extended. Under normal conditions they will last the life of the wheels.

No other bearings can offer all the advantages of Timken bearings.

Be sure to specify them when you buy. Look for the tradename "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas. One Cable address: "TIMRSCO".

This control is a product money on bearings are the best.

Sabre Jet's Edge Cuts Deeper...with Pastushin Tanks!

Pastushin-made pressurized fuel tanks give North American Aviation's F-86 greater fuel capacity.

Boeing Saves With Quality Control

Boeing Airplane Co. has been able to reduce much of its inspection work by a new method of systematic analysis developed after several years of research.

For example, parts produced in the machine shop previously were delivered in batches to inspectors who rejected any not complying with the standard. If something went wrong during the machining operation, a good many inspections resulted.

Under new procedures, an inspector works in the machine shop itself and checks a sampling of the parts produced by each of 30 machines every hour. If the cutting tool of a machine starts to wear, the inspector discovers it almost at once. It also keeps the department informed. The tool is sharpened or replaced before any parts are spoiled.

The inspector also keeps a chart for each machine. The chart shows the allowable variation in size, number of parts produced, time, and dimensions of parts checked. By analyzing the chart, the department supervisor can tell how often a new cutting tool should be put on the machine.

By sampling instead of by checking each part, savings are great deal of time and money. The supervisor, for example, says Edwood Kaiser, Boeing quality control manager. Out of 50 turbo-supercharger bolts produced by one machine in one hour, the inspector checks only five at random.

In the heat-treat department, the inspector no longer checks each batch of parts turned out but instead examines five samples from each tank every 24 hours. In the meantime he has kept a chart of the entire process—temperature and chemical content of the heat treatment solution, time of treatment, etc. By watching the inspector's chart, the men in the heat-treat department are able to control their operations with a high degree of efficiency. This greatly reduces the possibility of bad parts.

The method of inspection by sampling also has been applied successfully to receiving inspection. Charts and tables have been worked out to show how many parts in a specific number must be checked to give an accurate report of the quality of the whole lot. This type of inspection is used only in cases where faulty items will be discovered in assembly, however. Critical items which go into a plane will undergo piece by piece inspection.

The charts made by receiving inspectors because a part of quality control by showing which subcomponents turn out the best work, and therefore should be preferred.

Under the new program, the quality control department's work consists of about 40% inspection (measurement and analysis of products) and 60% quality control (establishment of procedures to prevent inspected parts).

RFC Machinery Loan

Tennessee Aircraft, Inc., Nashville, and notified RFC for loan of $2,500,000 to buy new machinery and supply working capital. The aircraft parts firm can play its...
M-270 Hull Reduces Flying Boat Drag

ON THE STEP Martin M270 research craft moves over the water of Chesapeake Bay. Plane is being used for development of high length-beam ratio hull, was modified from original experimental XP5M.

ON THE GROUND new hull lines of Martin M270 give sleeker look to original stubby lines of XP5M, minimize hull step, flatten Vee bottoms of forebody and flare out afterbody shape

Next style for sleeker flying boat hulls—a length-beam ratio of 15—is being modeled by the Glenn L. Martin Co.’s M-270 research aircraft.

Now in flight and taxi tests in the Chesapeake Bay area near Martin's plant, the M-270 is the full scale embodiment of tunnel and tank tested models of the past several years. Design of the new underbody on the M-270 was the responsibility of Martin's hydrodynamics group under J. D. Pierson, working closely with engineers of Navy Bureau of Aeronautics, National Advisory Committee for Aeronautics and Stevens Institute of Technology.

Airplane Design—The principal reason for the increased length-beam ratio on a flying boat hull is to cut down the aerodynamic drag. Hydrodynamic efficiency is little affected by the comparative dimensions of length and beam of a hull. But as the length-beam ratio increases, all three hull drag parameters—cross-sectional area, volume and wetted area—

AVIATION WEEK, June 23, 1952

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Automatic Instruments

Compass Indicators

Filter Components

Cable Lead Low Contact

Filter Components

Magnetic Compass

Filter Components

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Filter Components

UNCONVENTIONAL outline for a flying boat is shown in this view of the Martin M-270.

OXYGEN EQUIPMENT

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Line Relays

A.C. Transfer Relays

Overvoltage Protectors

A.C. Lead Contactors

Voltage Regulators

Engage Relays

Power Supply Failure Indicators

Voltage Regulators

Fused Contactors

ENGINE STARTING EQUIPMENT

UNCONVENTIONAL outline of flying boats is shown in this view of the Martin M-270.

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Castings of Aluminum and Stainless for a wide variety of applications in the precision industries.

35
Here's the latest...

on Johns-Manville products for military and commercial aircraft

Send for this informative booklet today

It tells about the new Johns-Manville Thermostatic Blanket with its lightweight RK-300 felt—the improved blanket type insulation for jet engine exhaust systems and aircraft power-plant assemblies.

It gives you facts about J-M Asbestos Textiles designed for insulating and fire-proofing aircraft structures and their component parts, exhaust system shields, and fuel, lubrication and hydraulic lines.

It describes the many special types of Goretex Metallic Gaskets—such as these afterburner spotter gaskets—fabricated by Johns-Manville in almost any size or shape to meet the hot-gas sealing requirements of jet engines.

It illustrates J-M Tadpole Tapes, the special firewall gasketing tapes for sealing combustion chamber inlets, engine mounting rings, turbine flanges and other high temperature zones in jet-powered aircraft.

For your copy of the new booklet about Johns-Manville Aviation Products, just fill in and mail the coupon today!

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TOW TANK MODEL of the M-270 hull proven through the test at Stevens Institute of Technology. Black hose on model has been reproduced on full scale to simulate water, serve to complete qualitatively test data of runs.

Conversion of the XP5M-1 was expedited for reasons of economy and time. Wing, engines and equipment were already proven components. Cost of getting the M-270 into service was less than $11 million, a relatively low figure by today's standards.

Reincarnations—Here's an interesting bit of history behind the parts which were adapted for the M-270. They're in their second reincarnation. It happened like this:

The wings and hull crown-upper body sections were taken from the experimental XP5M-1 flying boat (much like Ebb's Petrel). Ebb's Petrel Project, which was mostly a Grumman H-4, Woodsman (see AVIATION WEEK Apr. 21, 1952, p. 46), and already under the long modifications it embodied, was new.
New Potter Electronic Flowmeter and Tachometer

Improved design eliminates

* BEARING MAINTENANCE
* HIGH PRESSURE DROP
* BEARING FRICTION

The improved Potter Electronic Flowmeter and Tachometer's advanced accuracy and simplified design mean more savings. This new design of meters has been thoroughly checked, high pressure drop, and bearing maintenance.

The Flowmeter combines a flow reading and level meter in a single instrument. A magnetic lining is employed to avoid any magnetic interaction with the flow itself. An entirely new electronic design is used, both in the Flowmeter and in the Tachometer.

ACCURATE within ±1%.

Since the meter, high-efficiency rotating parts drive an entirely hermetically sealed system within a vacuum. The mechanism operates without any slippage, backlash, or wear, and maintenance is particularly low. The Tachometer is designed to maintain within ±1%.

Equipment is available with specific gravity compensation adjustment.

APPLICATIONS

Flowmeters are suitable for such applications as test bed, test stand, test chamber, test shop, test room, test area, test station, test laboratory, test facility, test equipment, test instrument, test device, and test system. Flowmeters can be used in a variety of industrial applications, including petrochemical, pharmaceutical, food, and beverage industries.

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1st Choice for Defense Warning Systems!

Chrysler Air Raid Siren...

Soads loudest warning ever produced!

Because of the tremendous power supplied by the Chrysler 180 horsepower Industrial V-8 Engine, this powerful siren produces 138 decibels of sound, 100 feet from the throat! It is the loudest warning sound ever achieved by modern production.

Costs less for complete coverage!

The Chrysler Siren offers greatest coverage with the least number of sirens. More sound carries over a wider area—a four-mile radius under normal conditions.

Independent Power!

All necessary power is produced by the V-8 Industrial Engine, making the Chrysler Siren independent of central power systems. For mobility, they may be mounted on trucks or boats, if desired.

Can be remote-controlled!

By means of ingenious public utility circuits, Chrysler's sirens may be remotely controlled from a hidden control station. They can be manually operated at the location also.

Chrysler Siren Technicians will help chart your area. Just send us a geographical map, indicating the perimeter of coverage desired. Write Siren Layout Service, Chrysler Corporation, 12000 E. Jefferson Ave., Detroit 31, Michigan.

AVIATION WEEK, June 23, 1952

CHRYSLER AIR RAID SIREN

PRODUCT OF MARINE & INDUSTRIAL ENGINE DIVISION OF CHRYSLER CORPORATION

Civil Defense is a common need, shared by all. Help yourself to preparedness. Join the Civil Defense group in your area.
THRUST & DRAG

Friend of mine based on recently as a group leader in fuselage design for a firm with large production contracts for large aircraft. Design state of the airplane was somewhere between preliminary stages and production drawings.

One of the firm's designers didn't produce for weeks, and a visit to his booth found only the left hand and clearance dimensions in place—no details. When asked how come, the designer hedged a bit and then asked what he should do. My friend suggested that maybe he ought to take a section through the bulkhead here and there and check the needed section properties from the loads that were applied. "What's a section?" inquired the designer.

Well, my friend hand about that one and the truth came out. The designer and something to this effect. "I used to be a mindset analyst—drew up curves of market trends and that sort of thing. One day I found they were giving jobs away in this outfit so I came up to Personnel guy says, 'What did you do on your previous job?' and I said, 'Draw curves,' and—'Fine and the personnel guy, 'You're a designer.' So here I am, a designer, and I don't know what the hell a section is or a bulkhead or a longitudinal. They're paying me $150 per week plus my overtime, and I'm miserable. These two weeks have been the most miserable in my whole life and I'm quitting.'"

He did quit the next day. And my friend wonders who'll be the replacement.

* * *

T. O. M. Sopwith, chairman of the Hawker Siddeley Group, was one of the great pioneers of the aviation industry. The kind of young thinking that he brought to his team and agile fighters of World War I. I still hold his comments. Listen to this plea for new thinking:

"I know from my experience that there comes a time when, for any number of considerations, political or practical, there is a tendency to hold back, to be cautious, to take a conservative line in design and development. We who are born to aviation should never tolerate such an attitude. New planes, new prototypes are constantly appearing, and never projects are the drawing board. Jet power has brought it many aerodynamic problems that we never faced before. Let us be bold, let us be in the development of new engines and our aircraft. It is my fervid belief that a plane is radical, let us give it a full chance to prove itself and don't let us tamper with progress." —DAA

RADIOGRAPHY checks procedure

Here you see a radiograph of our engine block. It was a new design—an almost ready for production. It was important that it be sound, free from sand or gas holes—and with no core shifts.

To be sure, pilot castings were radiographed. It was the one way to know these internal conditions without destroying the casting.

More and more foundries are making radiography a routine procedure. It is the way to be sure only high-quality work is released. In production runs it indicates ways in which methods can be improved and yield increased.

If you would like to know how radiography could improve your plant operation, talk it over with your x-ray dealer. Also, if you wish, we'll send you a free copy of "Radiography as a Foundry Tool."

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

Radiography...

another important function of photography
no lubrication problem

The unique design of the Torrington Needle Bearing minimizes lubrication problems. The turned-in lips of the outer shell retain a large reservoir of oil and grease. And the full complement of small diameter rollers ensures a thin lubricating film to all bearing contact surfaces. In some applications, the original lubricant will last for the life of the product.

Have you considered this and other Needle Bearing advantages such as high radial load capacity, light weight and compact size—in terms of your product? Torrington engineers will welcome the opportunity to give you full details.

---

**TORRINGTON NEEDLE BEARINGS**

Noodle • Spinholster Roller • Tapered Roller • Straight Roller • Bolt • Needle Rollers
NEW PARKER O-RING COMPONENT EXCELS IN FUEL RESISTANCE

The newest PARKER fuel-resistant compound (Lab Code 1090-1) has excellent low-temperature characteristics... undergoes 20% less volume change in hydrocarbon fuels (such as MIL-H-3846 Type III) than other compounds heretofore developed... has shown a hardness of 70°F, 1,500 psi tensile strength, 20% elongation, bonding moment of only 0.75 inch-pounds at 70°F.

O-rings molded of this new compound are especially suitable for aircraft fuel-resistant service subject to qualification at -65°F where many compounds have been unsatisfactory because of high swell.

PARKER is the only source for all standard O-rings to most specifications covering fuel, hydraulic and engine oil service... and for special service O-rings as well. Ask your PARKER O-Ring Distributor (listed at right) for Catalog 5100, or write The PARKER Appliance Company, 17350 East Ave., Cleveland 12, Ohio.
In the last eighteen years, American Airlines has flown more than
14,700,000,000 passenger miles. Over every mile, this great airline has lubricated its powerful engines exclusively with Sinclair Aircraft Oils.
They have proved outstanding—year after year after year
No wonder, then, that 40 percent of all aircraft oils used by major airlines in the United States is supplied by Sinclair.
Shouldn't you consider changing to Sinclair—now?
Got a really tough capacitor network problem?

Let our network designers help you solve it!

Whether your problem deals with guided missiles—aircraft—land or sea radar equipment, General Electric application and design engineers can help you solve it. We've designed and built capacitor networks for every type of radar equipment since the invention of radar. Take service life, for example. You can specify a service life of 10,000 hours—or just 60 seconds. And we'll deliver pulse networks to match your requirements. Here's why:

Since 1944 General Electric has been running continuous life tests on many types of networks. We've established life limitations, under varying conditions of temperature and voltage, for all types of dielectrics, bushings, materials for coil forms and related information and experience to solve your problems. Your inquiry addressed to your nearest General Electric Sales Office, or to Capacitor Sales Division, General Electric Company, Hudson Falls, N. Y. will receive prompt attention.

G-E SILICONE RUBBER PARTS

To protect electrical equipment from moisture and oil chemicals, General Electric silicone rubber parts are now being used in waterjet gnition systems in many U.S. military vehicles. Their low moisture absorption, high heat resistance and excellent insulating properties make them ideal for this application.

G-E silicone rubber's remarkable properties make it valuable for many applications. It withstands exposure to 350°F in moderate and high heat applications. Besides, being resistant to solvents and organic liquids at temperatures as low as -85°F without becoming brittle. Its low compression set, even under high load, makes it ideal for washers and breakers in electrical equipment like transformers and capacitors.

For more information, write to General Electric Company, Section 119-40, Chemical Division, Pittsfield, Mass.

G-E silicone rubber parts, with their unique combination of properties, including high fatigue strength, dimensional stability and low temperature effects, are ideal for use in many applications. They are resistant to a wide range of solvents and aggressive environments. For more information, contact General Electric.

Precision Products, Inc., IOA, ANGELES 

3% HIGHER RATE OF CLIMB SELLS Planes!

Make your plane stand out with AEROMAXPRO, the world's only automatic variable pitch propeller for personal planes. Fast, safe, it adapts any plane to get up and go! Find out for yourself, write for a free catalog to KOPPERS COMPANY, INC., AEROMAXPRO, 359 Scott Stt, Baltimore, 3, Maryland

Specify

G-E Complete Fabricservice also offers you!

G-E silicone rubber parts, with their unique combination of properties, including high fatigue strength, dimensional stability and low temperature effects, are ideal for use in many applications. They are resistant to a wide range of solvents and aggressive environments. For more information, contact General Electric.

The propeller with a break for personal planes.

GENERAL ELECTRIC

If the problem is heat or corrosion

Select the right materials for your application. Choose from our wide range of materials specifically designed to withstand high temperatures and aggressive environments. Get in touch with our experts today to select the right solution for your needs.

You can find the perfect solution for your needs. Choose from our wide range of materials specifically designed to withstand high temperatures and aggressive environments. Get in touch with our experts today to select the right solution for your needs.
here's why LOCKHEED said

Now and revolutionary in design, Model AV-16 Gate Valves provide the aircr...
IATA Hunts Space in Crowded Airwaves

• Airborne radio meeting held in Copenhagen.
• Channels, intelligibility, equipment studied.

By Philip Klass

The problem of providing enough radio channels for the world's air traffic continues to grow. By the middle of this year, Copenhagen's just-held radio conference and equipment symposium, sponsored by International Air Transport Asso., was rich in ideas for solving the problem. The symposium was Edgars A. Post, staff superintendent in the communications section of United Air Lines' Denver office.

Con:—This is what the experts believe will be coming in the not too distant future.

• 140 VHF channels may be required by 1960 for international operations, a seven-fold increase over the present 19 channels assigned by ICAN.
• The U.S. may require 240 channels some time after 1960. At the present, VHF equipment being manufactured in the U.S. today is designed to cover 180 or 360 channels.
• VHF and UHF communications won't completely displace HF communications, particularly in high-density areas and sparsely settled land masses.
• As many as 100 HF channels may be required in the future for aircraft operating over long water areas.

The experts considered ways to square more communications channels into existing frequency allocations. One solution discussed is a system which operates with a single side band (SSB) frequency instead of the presently used double side band (DSB) system.

The SSB transmission system operates on a "suspended carrier" SSB system now undergoing experimental test which was reported to exist:

• A 9-db (800%) increase in signal strength is possible with the suspended carrier system.
• More intelligibility in face of interference is possible.
• Practically no distortion due to selective fading is possible.
• Less likelihood of jamming from single strong interference is possible in the band channel.

To produce a suspended carrier SSB signal, a balanced modulator is used to eliminate the carrier and one side band is then filtered out. Recovery detection of SSB requires a crystal-controlled local oscillator operating at the same frequency as the suppressed carrier frequency of the transmitter. The local oscillator output is combined with the SSB signal to give a beat frequency corresponding to the original output frequency of the transmitter.

In spite of its many advantages, the JATA experts don't feel that SSB is "just around the corner," as there are many factors involved in changing over from DSB. However, JATA symposium experts feel that SSB is the equipment of the future.

"British "Class B" System—Britain is using a system involving a carrier and three side bands which can be used for radio transmission. They are used in the following manner:

• Double-Starling—Advantages:—With the carrier and one sideband eliminated, all transmitter energy goes into the remaining single sideband giving highest signal strength. The SSB frequency band is only half as wide as DSB, allowing twice as many channels in a given portion of the spectrum. In addition, the signal to noise ratio is improved because of the narrower band and increased sideband power.

Disadvantages of SSB come from increased transmitter and receiver complexity. The receiver must contain a crystal-controlled automatic frequency control to hold the local oscillator within 50 cycles (a channel). Other wise, excessive distortion exists down to intelligibility.

In spite of increased SSB complexity, JATA experts feel that the SSB air born equipment would become much easier than existing DSB units.

French techniques suggested using unsuppressed carrier SSB system to ease the automatic frequency control problem. This would improve intelligibility, but introduces some of the increased signal strength of the suppressed-carrier system.

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It's been a fast 10 years for PESCO too!

...keeping up with G. E.

Jet development

When General Electric completed America's first aircraft jet engine in 1941, and jet-powered flight became a reality, a PESCO fuel pump made certain that it was fed all the fuel it needed.

During the 10 years since then, PESCO has designed and built a pump model for each jet engine that General Electric has developed.

PESCO is proud of this record ... a record of design, engineering and production that has more than kept pace with the fast development of the jet engine.

frequency so that a receiver with a 36-kc bandwidth can receive all stations on a single channel setting.

The 10-kc separation between stations prevents interference. Yet it permits a plane moving from one transmitter to another to talk to each station without changing receiver channel settings.

Private Line—Another way to reduce the need for VHF channels is the "private line." As conceived, the system would permit ground transmission of routine command messages to any single plane of up to 40 aircraft total.

By a time-sharing procedure (transmitting first to one plane, then to the second, then to the third, etc., then back to the first, etc.) the private line system is expected to operate on a single channel. To do this would require that each plane be able to store its message until it receives its next transmission.

U.S. activity, as described to IATA, centers on the use of a new cathode-ray tube which gives a pictorial TV-like presentation in the cockpit. The new tube is capable of storing its messages between transmissions.

Major interest in private line appears to be concentrated in the U.S., the IATA symposium didn't feel it was urgently needed in international operations.

Suppressed Antennas—Above speeds of 250 mph., suppressed antennas (mounted flush, or nearly so, in the
tube) will be used to prevent transmission interference.

Typical of these Gyros in the type 4100A, a two-axis, gravity-oriented Vertical Gyro Transmitter designed for use on a non-vertical reference where vertical stabilization is required. The instrument is essentially an axially driven, vertical-throw gyro with separate Autosyn* transmitter pick-offs on the pitch and bank axes. Sealed in an aluminum case, protection against environmental conditions is accomplished by means of a double O-ring bayonet six foot seal. Signals are brought out via sealed headers (terminal panels) and easing and uneasing is obtained through O-ring releases. Provision are incorporated within the case to reduce hopper end error encountered in turns. A degree of automatic tuning is provided in order to employ this feature.

ECLIPSE-PIONEER

ECLIPSE-PIONEER, one of the world's largest producers of Gyros, has developed a series of direct reading and remote transmitting Gyros for radar stabilization, navigation, remote compass, automatic pilot, and other similar airborne applications.

Typical of these Gyros is the type 4100A, a two-axis, gravity-oriented Vertical Gyro Transmitter designed for use on a non-vertical reference where vertical stabilization is required. The instrument is essentially an axially driven, vertical-throw gyro with separate Autosyn* transmitter pick-offs on the pitch and bank axes. Sealed in an aluminum case, protection against environmental conditions is accomplished by means of a double O-ring bayonet six foot seal. Signals are brought out via sealed headers (terminal panels) and easing and uneasing is obtained through O-ring releases. Provision are incorporated within the case to reduce hopper end error encountered in turns. A degree of automatic tuning is provided in order to employ this feature.

Specifications for Eclipse-Pioneer Gyro Type 4100A

Dimensions: 9.35" dia. x 3.5" L.
Weight: 1.9 lbs.
Bandwidths: 300 kh to 1.5 Mc, with normal tuning of the pick-offs at 0.5 Mc. This permits tuning of a receiver to an actual position and maintains the gyro in a vertical position to within 1/4" of vertical.
Casing: Aluminum and steel, with 0.187" wall thickness.
Power Requirements: 9 volts D.C. input.

Basic and Pitch Pickoff Information

Input signals: 5 volts D.C. peaks.
Input sensitivity: 2 volt/degrees
Input deviation: 0.35 percent of input deviation
Gain stability: 0.5 percent per hour
Date: (with adjustment, if input to 5 volt D.C.): 0.5 volt
Sensitivity: (with adjustment, if input to 5 volt D.C.): 0.5 volt
Casing: Aluminum and steel, with 0.187" wall thickness.

For additional information, write to Dept H

ECLIPSE-PIONEER DIVISION of
TETERBORO, NEW JERSEY

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The convoy was designed to navigate the complex layout of the theoretical field, ensuring that each data point was captured accurately and systematically. This approach would allow for a comprehensive understanding of the terrain, enabling informed decision-making by the command staff.

Experimental data indicates that the integration of advanced navigational systems, such as lidar and satellite imagery, would significantly enhance situational awareness and operational efficiency. These technologies, when coupled with robust command and control architectures, promise to revolutionize how military operations are conducted, particularly in challenging environments.

In conclusion, the convoy approach and the integration of advanced navigational systems hold immense promise for enhancing military capabilities. Further research and development in this area could lead to significant improvements in operational effectiveness and mission accomplishment.
New Books


Two dozen of the top current USAF and USN airplanes are pictured and described, with specifications, in this book. The photographs are large and show the planes' characteristics well.

The book is planned to develop recognition sense of important U.S. military planes, with text kept to a minimum. There are cases where data that has been released (such as the B-36's armament) is not current, but a tagged "restricted information" The author also classifies all guns as "machine guns," whereas many of the planes have cannon. But it seems to be a good buy at the price—EJB.


This is a comprehensive work stressing the wise run of repairs in aluminum structures, with particular emphasis on aircraft construction. It is well organized and illustrations are clearly annotated. The book should serve as an inclusive and practical reference for designers and mechanics. Main sections are devoted to general information on structures and repair, materials and processing, repair procedures, standard fixtures, and an appendix of useful data—mathematical tables, formulas, solutions, equations, etc.

People who prepared the manual are expected to have been engaged for the past 10 years in designing and stressing typical repairs for "Handbooks of Repair" supplied under contract requirements for military and commercial aircraft.

Telling the Market


Air Power at Work pictures and describes 35 production problems and how they were solved by using a combination of Maud air devices set up to provide some automatic or automatic operations. Available from Maud Specialties Co., Dept. NB-9, 411 W. Kinzie Ave., Chicago 11.

An automatic continuous milling machine specifically designed for aircraft work on large dimensional parts such as spar beams and stringers, at high speed, is described in bulletin available from Oasis Machine Works, Inc., 3900 W. Palmer St., Chicago 47.

Folder on Thermocouples blanked out in insulating aircraft powerplants and furnaces is aimed at engineers and design personnel. Describes the Type K inside-out construction and Type RF felt models. Write Johnstone-Mansfield, 22 E. 40 St., New York 16...

Complete line of Hobart aircraft energizers for supplying power while planes are on ground is detailed in folder available from Motor Generator Corp., Troy, Ohio...

Thunderjet and Lightning!

Ability of the USAF's new Republic F-84F Thunderjet to strike like lightning in support of ground troops—to carry an extra-heavy load of armament—and to fly exceptionally long distances as a super-fast fighter—all accent the importance of materials which provide maximum strength with minimum weight. And Republic Aviation Corporation, Farmingdale, Long Island, supplies Ostuco Aircraft Tubing to meet these requirements.

Favorable strength without weight characteristics plus specialized forming and machining qualities make Ostuco Tubing the choice of 24 leading U.S. plane manufacturers for leading gear, fuel lines, and many other applications.

Ostuco Aircraft Tubing meets all Army, Navy, and A.M.S. specifications. Send for free Handbook A-2 packed with facts for ready reference on Ostuco Aircraft Tubing. Airframe Stock List (revised bi-monthly) also available. Address your nearest Ostuco Sales Office or write direct to General Office, Shelby, Ohio.
Breeze has the engineering staff, the shop capacity and special test equipment to produce hydraulic actuators of all types.

All engineering work, from basic specifications to final design for production, can be handled for you.

High-capacity machine tools provide low unit costs. Special tools, such as honing machines, give finishes to the exact micro-inches required.

Breeze has all the test facilities for magnetic inspection, proof and bursting pressure tests, life cycles and other A-N standards.

**HYDRAULIC ACTUATORS**

**Staffed and Tooled for**

A-N SPECIFICATIONS

**BREEZE HYDRAULIC ACTUATORS**

BREEZE CORPORATIONS, INC., 41 S. Sixth St., Newark, N. J.
Air Does Hairline Job in Turbine Drive

By Scott H. Reisinger

Air has been harnessed to do a de luxe drive and control job by Strat-

os, div. of Fairchild Engine and Aircraft Corp. The company's new air turbine

drive will perform with utmost fine-tuning accuracy, despite drastic ups and downs

in air supply, Stratios claims.

Air, in effect, also computes and solves problems to keep the turbine drive on an even keel—at a constant

speed—under widely varying conditions imposed by fast changing altitudes, tem-

peratures, engine power settings, manu-

vers and other factors existing in a jet

fighter in flight.

In the TP 15-2 Air Turbine Drive, de-

tails of which are revealed here for the

first time, air-operated controls keep the

'state of the art' speed of the turbine

drive within 0.1% of that specified

'Actually, it can be less than that,' says

Stratios engineers. 'We can't even

imagine the variation sometimes.'

Job in Bumace—The TP 15, like all

others of its type, bleeds air from the jet

engine compressor section. It was

originally developed for the F2H Jet-

drone Navy fighter, to drive a radial alter-

nator at constant speed, but it can be

used for driving other accessories. Ex-

tremely important is electronnique

drive gear since slight variations in

power supply will blur accuracy.

Hot jet compressor air, up to 1000° F,

is ducted to the drive, then split up for

several jobs. Its main one, of course, is

to make the turbine wheel rotate (at

12,000 rpm), turning the drive shaft

(three reduction gearing) at a speed

of 6,000 rpm. Other air is shunted off

for control functions—to keep speed al-

ways at these constants, regardless of

loads imposed by the alternator or

changes in power supply.

In short, the control is in the middle

and must tie down variations from both

casts—changes in the driving and driven

ends—and must do so with a fine preci-

sion. Thus it is a large job, perhaps

roughly comparable to a person holding

two bucking broncos with a rope in

each hand while keeping his arm out

at his sides in a military stance.

Transient variations, caused by sud-

den changes, never cause speed to vary

more than 5% and then only for about

a second at most, but usually less,

Stratios says. This is maintained even

when the alternator changes instantly

from zero to 100% load—as when an

alighting jet is suddenly pushed to full

power, or pressure pike up in a high

speed dive.

Agile Control—Capacity of the equip-
m ent to maintain constant speed drive

de despite these severe changes is a re-
sult of the agility of its air-operated con-
trol, Stratios says. Any change—and all

changes bed down at the control to a

change in speed of the turbine drive—is

sensed in 0.01 milliseconds, recovery

is started within 0.2, and full corrective

action taken in 0.4 milliseconds. This

means all operation within the con-
trol has been completed in that time

to compensate for the particular vari-

ation.

In the final analysis, all control action

is directed at moving a throttle valve one

way or the other to supply more or less

air to produce more or less power to

the turbine wheel to keep it at a con-

stant speed.

No 'Drop'—The control is a 'pro-

portional control and rate device.' In

essence, it brings drive speed right back

on the line,' Stratios engineers emphat-
ically. There is no 'drop' at all, they

say, ever, about.
Inconel "X" may hold the key to your aircraft design problem

Suppose you wanted an alloy that met these specifications:

-High elastic limits above 1300°F
-Outstanding high-temperature strength
-High resistance to oxidation
-Readily fabricated into shape needed
-Weldable by commonly-used methods

Then, Inconel "X" is your alloy! An age-hardenable alloy, it has every one of the properties mentioned—and a good many to spare. The jet plane afterburner bellows shown above is one application where Inconel "X" filled the bill perfectly; there are countless other aircraft jobs where it also meets all needs.

Let's take a brief look at some of the principal characteristics of Inconel "X":

After suitable heat treatment, it is an unusually strong alloy both at ordinary temperatures and at red heat. It offers excellent resistance to oxidation at high temperatures. Its stiffness, or modulus of elasticity, is high—about equal to that of alloy steels.

Resistance to impact is good too. And you also have hardness, machinability, good forging and fabricating qualities. As for welding, this can be accomplished by most of the commonly-used methods including metal arc, inert gas metal arc or atomic hydrogen arc, resistance spot and seam, and resistance butt. In short, Inconel "X" is the kind of metal you can work with—and get the results you want.

Naturally, there is not space enough here to cover all of the properties and characteristics of Inconel "X". So we've prepared an 80-page reference manual and packed it full of all the kind of information we thought you'd like to have. You can get a copy—without charge—by dropping us a line and asking for the "Inconel X Data and Information Manual." Write for it now.

One final—and important—point: Inconel "X", like other metal alloys, is now an extended delivery because of defense needs. So it is as important to include NPA rating and complete end-use information with all orders.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 2, N. Y.
Telescoping Boom Services Speeding

Speeder serving and maintenance of large aircraft is speeded with a new mobile boom recently developed by the Dowwill Co., Portland, Ore.

Now being studied by engineers of leading airlines, according to Dowwill, the boom serves a ground crewmen aloft and allows him to lower over various sections of the plane. He may swing from filler cap to filler cap in peeling operations, never treading on the wing.

Since the boom is over 10 ft. long, truckers can park farther from planes than is now possible, making for greater safety, from fire hazards.

The boom is fitted to the back of a truck, supports the worker in a "crow's nest" at its tip. From this vantage point he controls movement—up, down, in and out—actuating with six foot pedals many hydraulic power.

Various points in the plane can be checked from this perch in a fraction of the time normally required, says Dowwill. To avoid topside the worker, his cage, which has a small high protective railing, is self-leveling, regardless of the angle the boom may assume. The cage is also completely insulated electrically, the flooring being of Micarta giving 24,000-v. protection and the whole gear mounted on the boom on special, heavy-duty hydraulics. Various services, such as compressed air, can be provided at the cage.

The boom can assume any position through a 90 degree arc from horizontal to vertical and at any point can be locked in any position. It can be retracted 270 deg. No outriggers are needed.

Inside the truck, there is a duplicate set of controls. The boom locks automatically if the engine stops. When not in use, it can be retracted for traveling, providing 10 ft. clearance. It can be mounted on any 2 ton or larger truck if the distance from the rear of the cab to the next axle is as much as 102 in.

Dowwill Co., 533 S. E., Main St., Portland, Ore.
**Non-Destructive Test Service Set up**

Sperry Products, Inc., has established a new "cold" service, providing engineers and equipment at a fee to investigate for presence of defects in metal and plastic parts, by means of non-destructive testing.

The equipment developed by Sperry and used by surgeons for maintenance purposes. It can detect cracks in aluminum at zero minutes of operating aircraft, can be used on new pieces as well as old, for production-line or field work.

It includes a Reflectoscope, which finds flaws by ultrasonic techniques. The device has successfully located defects as much as 90 ft. from the point of contact on the metal surface, Sperry says.

Uniformity of metal thickness can be determined by a companion piece, the Reflectoscope. This permits measurements to be made from one side.

The Reflectoscope locates discontinuities by detecting high frequency sound vibrations, and measuring time of reflections from discontinuities in the path of the beam. A crack can intercept the signal, for example.

The service was established for those concerns having only occasional use of such equipment, but whose needs do not warrant purchasing or training personnel in its use. Through bench-service offices, Sperry is prepared to give day-to-day service to companies throughout the country. But if parts are small enough, they may be sent direct to Sperry's laboratories for analysis.

See your Sperry Sales Office or write Sperry Products, Inc., Dayton, Ohio.

**NEW AVIATION PRODUCTS**

**Sealant Remover**

Kelto Descal 1-NS, to speed and simplify removal of fuel tank sealants in aircraft, has been announced by Kelto Products, Inc.

Big advantage claimed for this product is that no washers are required when it is used to prevent etching of fuel tank metals. Kelto notes there have been scattered instances of inadvertent etching when inhibiting agents used with other sealant removers were stirred by action of circulating pumps used in the stripping operation.

Descal 1-NS permits successful stripping of most tank sealants by the fill—

---

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LAST LONGER

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SINCE 1940 Schuttig and Company has been designing and manufacturing electronic devices to meet exacting requirements of government agencies, manufacturers and airlines. As specialists in communications, remote control and navigational equipment, both ground and airborne, Schuttig has earned its reputation for electronic precision.

Schuttig and Company Incorporated
Washington 17, D. C.

Electronic Manufacturing Engineers

English Valves

A hydraulic selector valve for operating pressures up to 4,000 psi... is being offered by Dowty Equipment Ltd. The valves are electrically actuated, controlled by switches in the cockpit, and are designed to assure rapid response with maximum pressure drop. The model shown in the sketch above is a twin solenoid type. Model 4600 Y. It provides a four-way, three-position selection, with a neutral position. Other three-way, twin solenoid types, with or without a neutral position, or with flow to the selected service either open or closed after de-energizing, are available.

Normal flow capacity of valves is 20 gpm. They are built for operation at temperatures down to -65°F. The single solenoid type weighs 1.9 lb and the twin solenoid 2.5 lb. Dowty Equipment Ltd., Aile Court, Cheltenham, England.

Resists Skydrol

An aircraft wire designed to resist chemical action of Skydrol non-flammable type hydraulic fluid and low temperatures is being marketed by Suprenant Mfg Co.

The wire reportedly meets Spec MIL-W-5274A, sodium, gasoline, fungus, fibrous and flame. It is protected by an extruded primary insulation made from Geo polymer chlorinated polyethylene and cotton. The plain insulation won't crack at a temperature of -54°F, withstands 1,000 v /c at 60 c ms. The complete wire, with a glass fiber braid covering the spin-Braun insulation, must withstand 12,000 v rms to meet military specifications. A Type III wire has glass fiber braid covered by Geo polymer. Suprenant Mfg Co., Boston, Mass.

SHELL AVIATION FUEL

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AIR TRANSPORT

‘Public Interest’ to Decide Colonial Sale

• Carrier cannot count on selling to highest bidder, CAB warns in letter to President Dykes.

• Nyrop action is prompted by Colonial rejection of merger with National and action asking for bids.

By F. Lee Moore

Colonial Aeronautics Board has warned Colonial Airlines President Branch Dykes that he cannot count on selling Colonial to the highest bidder. The necessary CAB approval will depend on whether the merger is “in the public interest,” the Board says.

What prompted the warning letter from CAB Chairman Donald Nyrop was the fact that Colonial is up for sale right now, with bids slated for opening this week. A National-Colonial merger was set May 14 by a Colonial stockholder newly owning National’s price wasn’t as good as an offer of Eastern Air Lines.

The new auction-discounted CAB especially since (the National deal already had tacit approval) of the Board, whereas “the Board has not to date entertained the time preliminary thinking (of Colonial merger) with any other airline.”

In his letter to Dykes, Nyrop notes that, as a matter of fact, the Board may cut down the price, even if it approves the rest of a particular airline acquisition (see deal).

CAB Terms—In his warning to Colonial, Nyrop notes the main considerations of the Board in approving any merger or airline purchase.

• Further traffic integration
• Improve route structure for the U S
• Create desirable competition
• Avoid excessive competition
• Build smaller airlines On this one, CAB said: “The Board (must consider) whether the resulting system tends further to balance the competitive relationships existing between the various carriers operating an air transportation system.” Some Washington observers think this implies the Board might prefer National over the larger Eastern, though CAB might not disapprove an Eastern purchase of Colonial.

CAB Sets the Price—The Board, of course, must place upon the purchase price of any agreement which shall be submitted for approval and will do its utmost to protect the public and the

stockholders from either an excessive purchase price or an unreasonable low purchase price.” Nyrop’s letter stated.

The proof of that point was the Board’s decision on the Northeast Air lines—buy of Melawyer Air in 1948.

The contract price for the bankrupt Melawyer, which hadn’t operated in five years was $77,750. The Board disapproved that. The physical assets were worth only $10,000, the Board said, and that was the price CAB would approve. As for operating rights and good will, CAB stated “It is adverse to the public interest to permit the transfer of certificates as though they were a speculative security.”

So regardless of what airlines run bad for Colonial this Thursday, CAB may whittle it to the fair value of the assets, company and property only.

No Auction Block—To make the situation even clearer, Nyrop writes Colonial and as follows: “You have advised the Board that Colonial Airlines has placed stock in large measure on the auction block and it will consider the bids submitted by all comers to whom an invitation was extended. This necessarily occurs with the implication that Colonial is more interested in the purchase price of a sale of the company than it may be in the various other possible aspects of the public interest.”

Board Procedure—The Board has a prehearing conference scheduled for this Wednesday to investigate “whether a merger or consolidation of National and Colonial Airlines would be in the public interest and in accordance with the public convenience and necessity.” In his letter to Dykes, Nyrop notes that “Colonial is a subsidiary airline and certain public benefits may result from the integration of National and Colonial.”

Lod Influence Grows

(McGraw Hill World News)

Tel Aviv—Increased use of Lod (formerly Lydda) Airport as an important stop between Europe and the Far East is seen with establishment of diplomatic relations between Israel and Japan.

MODERN AIR TERMINAL TO SERVE CHICAGO

This is how the new terminal building at O'Hare Field, Chicago, Ill will look when completed, with five “hangar” wings capable of handling all types of transport simultaneously. Concourse levels will be connected to first floors by ten escalators and fourways. Total enclosed floor area is the completed
Civil Penalty Power For CAB Is Urged

Congress, before it closes, may give Civil Aeronautics Board a new club to hold over airlines. Legislation giving the Board authority to impose civil penalties against violators, up to $1,000 for each offense, has been approved by the Senate Interstate and Foreign Commerce Committee. Requested by CAB, it would apply as well as before to any violation of CAB's rules, but it is directed at the new ideas. Board would have authority to impose fines and send them out of court. CAB at present can take two courses with an airline: It can let it slide, or it can file anti-trust suits.

- Issue a cease-and-desist order or refer case to Justice Department.
- Institute, through a U.S. attorney, a civil action for an injunction or a criminal contempt action.

The Senate committee said:

"From a practical standpoint, suspension pending prosecution proceedings could be used as a last resort in cases of knowing willful violations, and the usual actions are not appropriate and except in the most flagrant and serious cases. Also, there are other existing remedies for economic violations—cease-and-desist orders and antitrust—operative without time delay. Thus, an offender is on notice at this time, he is exercising a little caution, to engage in illegal practices until such action is commenced and even now some caution such conduct during its pendence."

"This permits him to keep revenue records and unaided conduct over considerable periods of time without danger of incurable monetary penalties. It would tend to make Northwest difficult to price. Some of the producers, also, would tend to make Northwest difficult to price.

"But when it comes to penalties, Northwest is in a position, strong, so there has been no much worry in the CAB that AllisWare, according to information submitted by CAB and Senate Appropriations Committee, is a breakdown of information submitted by

Year
1941
1942
1943
1944
1945
1946
1947
1948
1949

Controlled Civil Aeronautics
Airline

All-freight

35,062
28,988
41,506
32,439
43,285
44,145
47,929
56,069
61,392
70,253
74,424

Free Fares Carried by Scheduled
Airline (in thousands)

9,077
8,132,102
11,662,192
12,518,125
15,523,174
15,922,145
16,452,186
19,390

CAB Employment

6,019
6,368
6,693
6,934
7,174
7,415
7,656
7,923
8,124
8,325
8,526

CAB and Other Civil and Commercial, Military

2,345
2,609
2,769
3,426
4,026
4,496
5,769
6,456
6,463
6,437

Growth of Civil Aviation Since 1941

During 11 years, 1941 through 1951, civil airlines manage double the passengers, 1941 through 1951, according to information submitted by CAB and Senate Appropriations Committee.

Hearings before a subcommittee of the Senate Committee on Interstate and Foreign Commerce, according to information submitted by CAB and Senate Appropriations Committee. Here is a breakdown of information submitted by

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Growth of Civil Aviation Since 1941

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Tories Relax Hold On Airline Routes

By Nat McKinnirick

(McGraw Hill World News)

London—the door has been opened slightly for private operators to compete on Britain's home and overseas air routes.

In an official announcement, designed to fulfill a campaign pledge without enraging new legislation, the Tory government recently

- Authorized Britain's 20-old airline operators to compete on BOAC and BEA for permission to operate new scheduled passenger services at home and overseas.
- Authorized private operators to compete with the state-owned companies on all freight services, new and old.
- Authorized private operators to introduce special "third class" fares—thus allowing lower-cost fares on services already operated by the state-owned corporations within the British cologne empire. (Such services outside the empire would fall under IATA rates, or course.)
- Prohibited the state-owned corporations from flying aircraft specifically for charter.

But the new policy is a good bit less than the private operators had hoped. Many would want to operate services everywhere while state-owned airlines operate first-class fares. The private companies claim this new policy excludes them from getting into all possible fields of activity. Nonetheless, they say, they will do their best to accept "the crumbs of opportunity" offered while pressing for wider concessions later.

PLANE AND FANCY SWIMMING

Lusitania, Russian Aces, Panama Frost, and Airport Engines

Airport has added a 250,000 sq. ft. expansion to its facilities. The airport has added 250,000 square feet of additional space. The field covers 20,900 acres.

The White Cap—Under the Civil Aviation Act of 1946, some private operators are permitted to operate scheduled services. All operators wishing to take advantage of the new concessions will have to make "associate" agreements with one of the state-owned corporations. Right now, BEA has 19 such agreements with private operators, BOAC has none. Likewise, in the absence of new legislation, the licensing authority will be the Air Transport Advisory Council, a semi-private body set up to advise the Ministry of Civil Aviation. Eventually, ATAC will probably be succeeded by an authority similar to CAB. But at the start, the authority will be vested in the new Minister of Transport and Civil Aviation, A. T. Lennox-Boyd, who has and will continue to advise the Ministry on aviation policy.

By early September, BEA and BOAC were both up to 100,000 passengers. While BEA was the first to introduce new internal routes, with the possible exception of Scottish island routes, BOAC is even more ambitious, as the result of sweeping gains in recent provincial and municipal elections granted the government more powers. The government has agreed and now proposes that all state-owned operators should run for seven years or perhaps ten in some cases.

Plane Woes—Private operators are also worried about the availability of aircraft for any expansion of their operations. Most are saddled with overworked and inadequate equipment. It was only last month that the first private airline, Westmorland Air, Ltd.—equipped to operate scheduled services—had one engine out of four engines, for example. Handley Page Meteor from BOAC. Lennox-Boyd told the Commons he was worried of this problem and would have his Ministry do everything possible to see that the supply is maintained. But obviously the competition for aircraft is very keen.

The government has been slow to act because of the question of what happens to BEA's 250-old aircraft, a number of which are a loss to the "Titantic Service."

Lennox-Boyd had no doubt that the new law was a good start, but it was not all. BEA would not agree with any such competition on the grounds of "redundancy." BEA seems to have secured an exclusive concession of the only important internal services that do pay—London to Manchester and London to Glasgow. The government was firm against granting any subsidies to private operators undertaking such internal routes, with the possible exception of Scottish island routes.

The Labor Party, very busshey as the result of sweeping gains in recent provincial and municipal elections, granted the government more powers. The government has agreed and now proposes that all state-owned operators should run for seven years or perhaps ten in some cases.

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The altitude range from 8,000 to 9,000 feet above sea level to 3,000 to 4,000 feet above the ground at this spot.

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1951 \ 1952

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PAC Gets Key Dallas Sales Role

Sales and service of the two-engine $11 million de Havilland Dove light transport to Pan Am are now covered under a new agreement with the British makers, giving PAC a key distribution role.

Under the new arrangement PAC will handle Dove aircraft and place cubes on 17 East Coast states and West Coast states. All Doves will be formed from Brits to PAC's specifications at London, N. H., and will be delivered to de Havilland distributors in this country. PAC will maintain a $350,000 inventory of parts to cover its first two years of operation while PAC is building the Dove at Burbank.

The Dove will retail at $11 million and will be priced at $1 million. It will have a range of 3,000 miles and a cruising speed of 250 miles per hour.

The Dove will be built at Burbank and will be priced at $1 million. It will have a range of 3,000 miles and a cruising speed of 250 miles per hour.

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**Electronics Engineers**

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**Aerospace Physicists**

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**Research & Development Engineers**

If you're interested in research and development, then our company has a number of opportunities for you. We're looking for engineers who can help us advance our technology and develop new aircraft.

**Tool Designers**

We're also looking for tool designers who can help us develop new tools and equipment for our aircraft.

**Heating & Ventilating Engineers**

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dynamics and design experience. Personal interviews arranged for Waldorf or elsewhere.

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Aviation Week, June 22, 1952
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**WRITE—WIRE—PHONE**
No Knots Now

The "case of the nautical mile" has aroused more comment than any other in recent years as airline space pressures we will continue to demand with special reference to the second CAB decision which rejected knots.

The manner in which the intense interest shown in this case has been handled by the CAB (Air Conditioning Committee) will continue. This is a government composed of the Departments of Commerce (CAA), Treasury, Navy, Air Force and the CAB. These people voted, unanimously, to accept the CAB proposal.

** CAB on Top—Members of ICAO are bound by treaty to accept its standards, for both their domestic and international flying, unless they file a notice of deviation. Therefore, in the procedural matter at hand, regardless of actions by CAB and ICAO, only CAB has the authority to change Civil Air Regulations, which in turn control domestic civilian aviation. In this case, CAB, by its vote two years ago, made a change in the Civil Aviation regulations before holding a hearing.

For a variety of reasons the vast majority of civilian aviation leaders were expressed dissatisfaction with the proposed changes. In a parallel demonstration of American democracy, CAB, by majority vote, reversed itself and acceded to the wishes of these people.

** The Lump—The list of participants in the hearing is impressive for it represents the backbones of American power—aviation aviation. Among the crowd were the Aircraft Owners and Pilots Association, National Association of State Aviation Officials, Aeronautical Engineering Society, National Aeronautics and Space Administration, American Society of Civil Engineers, and the Bureau of Air Commerce. The Navy and Air Force were, in favor of the change, CAB's stand was rather indifferent.

Most important fact is that in this case was the average flying citizen did not feel that the change was justified. He was not convinced that CAB and the problems of oceanic travel and military operations warranted the disruption of his American system of measurements. This should indicate the "automatonic set" that more information about the fact that CAB should reach the public, people that considerably more effort should be made to explain the reasons to the public.

** Unanswered Questions—Some questions have been left unanswered, the relationship between ICAO, CAB, ACC, military aviation and the flying American public. Can CAB, command domestic aviation on matters of this sort before consulting them? Is CAB the final authority or can ICAO, through treaty, override? To what extent should domestic aviation in a democratic society accede to military requirements?

** Clarification Needed—There is, of course, an unmistakable case for international "standards." Probably the airman has not invested in greater practice more than pilots. As stated before in this column, ICAO has done much good work and its importance will continue to increase. Similar controversial issues will arise in the future, however, so it would be wise to clarify the procedures which allow domestic flying to voice opinions in major changes.

As the matter stands civilian aviation does not have to go knots at this time.
LETTERS

They Protest

On page 96 under Strictly Personal you wrote: EXCLUSIVE — WHY I LANDED AT NEWARK by our New York bureau. It seems to me that it should have carried as editorial comment.

Here we have an individual who is sincerely engaged on a project, a pilot, and it presumably a very important volunteer for preparing us on the public. He should show the whole of the service in the United States Department of Defense. But he insists on writing to you under the name of a famous journalist. He has written me a letter and a letter, and I was given the impression that you, and that is the impression of the whole of the service in the United States Department of Defense.

The letter can be read in the New York Times. It seems to me that it should have carried as editorial comment.

I have been writing to you under the name of a famous journalist. He has written to me a letter and a letter, and I was given the impression that you, and that is the impression of the whole of the service in the United States Department of Defense.

Research in Hiring?

Since time ago I wrote you a letter concerning my (unsuccessful) application for employment in various firms in the field of aviation. Since, I have made personal applications to two firms with totally different results. In both cases I was accepted and offered a salary which was more than I expected. I have worked for 10,000 hours recently, and the firms, which offer me a position, will give me the option of returning to work for an advanced degree in Industrial Science. However, my work with both will include design development and production in various service programs within the company.

I think that the failure of my application to read these clearly the following facts in the method.

- The inadequacy of the present application forms for hiring new employees is evident.
- The inequity of the hiring process experience of many of our employees, whose backgrounds are not as advanced in engineering, mathematics, and sciences does not exist.
- The lack of proper evaluation and procedures to accurately determine a person's potential, skill, and overall fitness for the job is staggering.

I can see clearly a professional field in research and therefore, my research remains to be completed.

H. W. Williamson, M.A.

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