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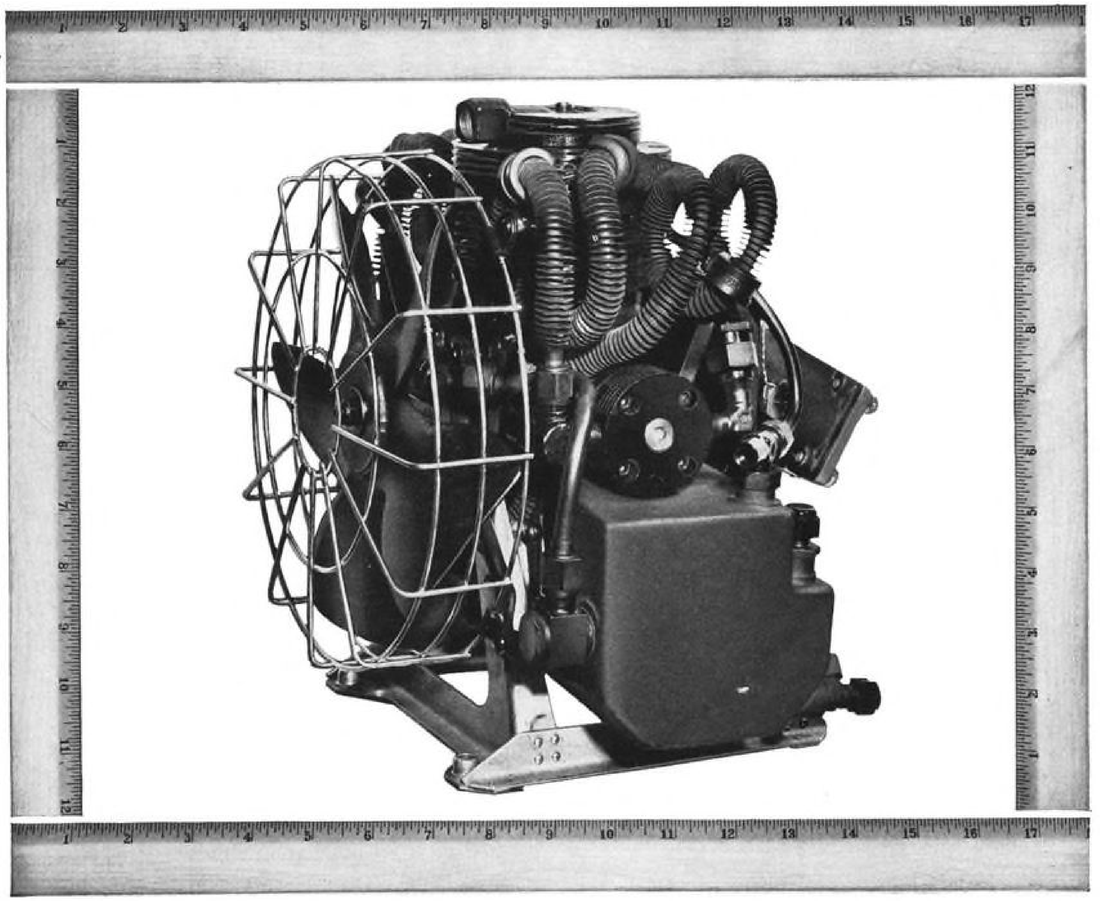

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NEWS DIGEST

Domestic

Peace talks between American Airlines and Air Line Pilots Assn. have broken off, and ALPA was trying to determine last week whether the National Mediation Board has relinquished jurisdiction in the threatened walkout over waiver of the 8-hr. nonstop flight limit. If the talks are not resumed, the union probably will set a new date for the strike, originally scheduled for July 15. Said NMB member Leverett Edwards: "We are awaiting further developments."

ZS2G-1 blimp, Goodyear Aircraft Corp.'s new anti-submarine craft, has completed its first flight. The 275-ft. Navy blimp is powered by two 800-hp. Curtiss-Wright Cyclone 7 engines with Curtiss Electric Beta-Props, specially developed for lighter-than-air ships.

Lockheed Aircraft Corp.'s Georgia Division is putting a USAF B-47 through modification, inspection and repair lines at Marietta under a new Air Force contract designed to keep planes up to the most modern configurations at all times. The modification program is expected to continue through January 1957.

New USAF weapon will be developed by Ford Motor Co. under a classified contract totaling approximately $1 million.

Republic Aviation Corp. has moved engineering personnel assigned to the F-105 fighter-bomber project from New York to a new office suspended under the roof of its main assembly plant at Farmingdale, N. Y. The transfer is designed to speed work on the project by bringing engineers closer to production personnel.

"Go now, pay later" credit plan for world air travel is being offered by American Airlines, featuring no down payment and up to two years to pay.

Lt. Gen. Hubert R. Harmon has been appointed superintendent of the new Air Force Academy, will organize the staff and direct the school's opening next year at temporary quarters at Lowry Field in Denver.

Aircraft Engineering Foundation, made up of C-46 operators, has offered to buy 60 of the twin-engine transports now leased from the Air Force.

Sperry Gyroscope Co., Great Neck, N. Y., has won a new USAF contract for more than $2 million in additional Zero Reader flight systems.

Boeing 707 Beats Comet 3 Into the Air

A new chapter in trans-Atlantic jet transport rivalry was opened when the Boeing 707 Stratoliner-Stratotanker (top) made its first flight four days ahead of Britain's de Havilland Comet 3, shown just before takeoff July 19. The new Boeing has exceeded 550 mph. and gone higher than 42,000 ft. in its early flight trials at Seattle, Wash. (see p. 63). These pictures afford an interesting comparison of U. S.-British design philosophies on configuration of four-jet transports.

Dr. Albert Zahm, 92, pioneer aviation scientist who built a windtunnel at the University of Notre Dame 20 years before the Wright brothers' first flight, died July 23 at South Bend, Ind.

C. T. Morgan, 60, public relations director for Air France, died July 26 in New York.

Frank B. Chadwick, secretary and service parts manager for Aircooled Motors, Inc., Syracuse, died July 11.

Financial

Douglas Aircraft Co., Santa Monica, Calif., reports net earnings of $19,178,939 from sales totaling $493,892,297 for the six months ended May 31, compared with a $10,042,975 net and $458,778,761 in sales for the same period last year. Backlog June 30: $1,902,603,000.

Glenn L. Martin Co., Baltimore, had a net income of $6,842,002 for the first half of 1954, a $2,338,837 increase over the first six months of last year. Sales totaled $97,204,912, compared with $70,982,577 for 1953's first half.

American Airlines had a net profit of $5,014,000 the first half of 1954, dropping from $6,658,000 for the first six months of last year. The net included a $903,000 profit on the sale of four DC-4s. Operating revenues increased from $98,849,516 to $111,236,667. Principal reason for the profit drop: 4% reduction in load factor plus increased expenses.

International

Indian Airlines has decided to buy eight turboprop Vickers Viscount transports for its domestic routes.

Shin Mitsubishi Reorganized, Ltd., has signed an agreement with North American Aviation to manufacture F-86 non-structural spare parts at its Tokyo plant and repair and overhaul FEAF Sabres.

The Aviation Week

August 2, 1954

Picture Credits

7—(top) Boeing; (bottom) de Havilland; 13—(center) Wide World; 15—(top) Douglas; (bottom) Sovfoto; 16—USAF; 42—Gloster; 44—Curtiss-Wright; 48—General Electric; 50—Parker Appliance; 63-64—Boeing.

Washington Roundup

Preventive War

Glimpses of Russian progress in long-range jet bombers, guided missiles and thermo-nuclear weapons have the Pentagon planners deeply concerned over the diminishing rate of U. S. superiority in these critical fields.

As a result, there is more and more serious talk of the advisability of a "preventive war" against the Communist bloc aimed at crippling their atomic airpower striking force while U. S. still enjoys a significant advantage in quantity and quality of long-range bombing weapons.

Proponents of the "preventive war" philosophy argue that if the U. S. allows the Communists even to approach parity in atomic airpower the results will be disastrous, because the Communists will have the advantage of striking the first and perhaps decisive blow.

H-Bomb vs. A-Bomb

Testimony of top nuclear scientists published by the Atomic Energy Commission revealed that A-bomb development has progressed to the point where a single unit would destroy all but a few types of targets and that two of the newest and most powerful A-bombs could obliterate any target.

Proponents of continued emphasis on A-bomb production argue that the newest fission weapons are cheaper, more easily deliverable and better suited for any military operation than the fusion H-bomb. Nuclear scientists testified in the AEC security proceedings on J. Robert Oppenheimer, former head of the Los Alamos laboratory and the AEC's general advisory council.

Engine Problems

Top USAF and Navy circles still are worried about the state of U. S. highspeed aircraft engine development in relation to British and Russian competitors. Current development program on the Pratt & Whitney Aircraft J57 aimed at making it capable of pushing the B-52 above 53,000 ft. (see p. 18) is a symptom of the problem. British Olympus split-compressor turbojet pushed a Canberra bomber to 63,000 ft.

Despite pessimistic analytical techniques that have been applied to the new Russian turbojets or by-pass engines powering the new Tupelov jet bomber (AVIATION WEEK May 31, p. 12), the Red powerplants still appear to be far advanced over anything flying even experimentally in the U. S.

Military planners also are seriously concerned over the number of U. S. jet development programs that failed to produce a serviceable engine during the past five years.

Industry Pleased

Aircraft industry reaction was extremely favorable to the recent tour of key plants by top USAF development and procurement officials (AVIATION WEEK June 14, p. 13).

The USAF representatives—including Assistant Secretary for Materiel Roger Lewis, Assistant to the Secretary for Research and Development Trevor Gardner, AMC Commander Edwin W. Rawlings, and Deputy Chief of Staff for Development Lt. Gen. Donald L. Putt—impressed aircraft builders with their willingness to listen to industry problems and their obvious desire to get a first-hand, on-the-spot impression of what industry actually is doing.

Nuclear Emphasis

Trend toward heavier emphasis on nuclear and thermo-nuclear weapons delivery systems in USAF development effort is indicated again by the recent ARDC switch of Brig. Gen. Howell Estes to head the Weapons Systems Directorate at Wright Air Development Center. Gen. Estes recently commanded Task Force 7.4 in the Eniwetok hydrogen bomb tests and previously was with the Special Weapons Center at Albuquerque.

Air Policy Legislation

Air Coordinating Committee's biggest project now is the preparation of legislative and administrative proposals to carry out its civil air policy recommendations (AVIATION WEEK May 3, p. 12). Proposals are scheduled to be presented to President Eisenhower by Nov. 1. Legislative requirements probably will be outlined in the President's speech which he will make to the new Congress in January.

Other major project in ACC's mill is the program to revise navigation requirements. Revision is aimed at increasing the air operations capacity and safety of the civil-military airways system.

Another Committee

Air transportation circles show little concern with the Cabinet-level committee the President has appointed to formulate Administration transportation policy (AVIATION WEEK July 19, p. 15).

Efforts to formulate "overall transportation policy equitable to all forms" have been going on in Washington almost continually since the end of World War II. The practical results have been slight.

Nothing ever was done about the old Hoover Commission's plan to divide Commerce Department into two branches, one a "transportation services" embracing all government transportation activities. Former Secretary of Commerce Charles Sawyer's 50-page report entitled "Unified and Coordinated Federal Program for Transportation" was ignored.

The President's committee—comprised of the Secretary of Commerce, Secretary of Defense and Defense Mobilization Director—is expected to come up with nothing more concrete than hazy platitudes in its report to be made this December. It probably will have the same fate as the Sawyer Report. Realistically, transportation policy is evolved by specific actions of Congress on specific problems.

Viscount Certification

Expect a decision in the next week or so on Civil Aeronautics Administration's certification of the Vickers-Armstrongs turboprop Viscount that Capital Airlines is buying (AVIATION WEEK June 14, p. 16). W. H. Weeks, chief of CAA's Aircraft Engineering Division, returned last week from a four-day trip to Britain, "exchanging views," he said, with Vickers officials on the certification problem.

—Washington staff

WHO'S WHERE

In the Front Office

W. A. DeRidder has resigned as board chairman and a director of General Metals Corp., will be retained by the San Francisco company as a consultant.

McGregor Smith, chairman of the Florida Power & Light Co., has been elected to the board of Eastern Air Lines. **Kenneth Kilcarr** has been moved up by EAL to assistant treasurer and **James C. Warlick** to assistant secretary.

Changes

Craig F. Timmerman, former manager of Air Transport Assn.'s central regional operating office in Chicago, has become director of the Air Navigation Traffic Control Division of ATA's Operations Department.

Alexander L. Anderson, former public relations director for Northwest Orient Airlines, has joined Lockheed Aircraft Corp. as New York and Washington, D. C., public relations representative. **Rodgers Donaldson,** onetime Lockheed eastern manager, has rejoined the company as assistant chief counsel.

Thurston Klayton, director of engineering research and development for Luria Engineering Co., New York, has taken on additional duties as chief engineer.

David B. Acker has been appointed industrial engineering manager for Convair's San Diego Division.

Larry Olenick has been promoted by National Airlines to public relations manager for the carrier's New England and mid-South regions.

William C. Heilbrun is new procurement director for the Aircraft Division of Kaiser Metal Products, Inc., Bristol, Pa.

Allen W. Schmidt has become manager of advertising and sales promotion for Resin Industries, Santa Barbara, Calif.

James H. Lymburner has been appointed sales manager for Canadian Aero Service, Ltd., Ottawa.

Thomas H. Bay has been promoted to sales manager for Fairchild Instrument & Camera Corp.'s Potentiometer Division, Hicksville, N. Y., replacing **Stuart Edgerly,** who resigned to join Fenwal, Inc., Ashland, Mass.

Victor P. Roy has become plant superintendent for Universal Metal Products, Inc., Alhambra, Calif.

Honors and Elections

Roy T. Hurley, president of Curtiss-Wright Corp., and six other aviation leaders have been appointed to the advisory board of the 1955 International Aviation Show, to be held May 4-6 in New York. The other top industry figures: **Richard S. Boutelle,** president of Fairchild Engine & Airplane Corp.; **Rear Adm. Richard E. Byrd; Robert W. Prescott,** president of Flying Tiger-Slick Airlines; **Robert M. Durham,** president of Durham Aircraft Service; **J. S. Kirkpatrick,** president of the Magnesium Assn., and **E. M. Benham,** public relations manager for Sikorsky Aircraft.

INDUSTRY OBSERVER

► Two Lockheed turboprop aircraft, the R7V-2 and C-130, now are scheduled for first flights in August. Company's XFV-1 interceptor is not expected to begin vertical takeoffs and landings until September.

► **North American Aviation's second TF-86 two-place trainer is ready for first flight and soon after will begin a tour of Air Force bases. First such tour was interrupted when the original TF-86 was lost in a crash which took the life of test pilot Joe Lynch (Aviation Week Mar. 29, p. 15). NAA pilot Charles Graham, who took the T-28B on a similar USAF base tour, is scheduled to pilot the TF-86 on the trip.**

► Nike anti-aircraft guided missiles will be produced at Charlotte, N. C., starting early in 1955. Government facility there will be operated by Western Electric Co. and Douglas Aircraft Co. Both firms now are producing Nike missiles.

► **Bids on airframes for six missiles are being sought by National Advisory Committee for Aeronautics. Aircraft probably are models for use in NACA's research program on heat problems of highspeed flight being conducted at Wallop's Island, Va.**

► All of the Strategic Air Command B-36 and RB-36 wings have demonstrated their ability to keep their aircraft flying for a total of 1,000 hr. or more during a single month. Latest B-36 wing to reach this operational status did so only nine months after being equipped with the intercontinental bombers.

► **Pratt & Whitney Aircraft finally has lifted the wraps on its new jet turbine blade called Waspaloy. P&WA credits the alloy with allowing higher operating temperatures in the J48 centrifugal turbojet and playing an important role in boosting J48 thrust from 6,250 lb. to 7,250 lb. without afterburner. Waspaloy has been used on the J48 for several years.**

► U. S. aircraft industry is beginning to rumble over the $75-million deal promoted by the Foreign Operations Administration to finance British production of Vickers Valiant bombers for the Royal Air Force with American taxpayers' dollars. Shortly after FOA made its deal on the Valiant, the British Ministry of Supply announced placing a production order for V-1000s, the military transport versions of the Valiant. Question asked by U. S. industry: "Is FOA really financing British jet transport competition for U. S. aircraft manufacturers with taxpayers' money?"

► **A staff report critical of the British military aircraft program—and raising the question of continued U. S. financing of it—is in the hands of members of the Senate Appropriations Committee, who will start consideration of foreign aid funds this week.**

► Defensive armament on the Boeing B-52 reverses the current trend toward larger calibers by returning to a tail turret mounting four .50-cal. machine guns. Test turrets have been installed and flown in a B-29 and are being installed in a pair of B-47 test beds.

► **Red air force uses "throwaway" kits for field maintenance of its aircraft. Mechanics draw parts from stock, already packaged with a set of cheap tools which are used just for the job and then discarded.**

► U. S. Army is pushing program under which transport helicopters would be loaned to commercial operators for scheduled operation as an accelerated service test. Concept has been approved by Chief of Staff Gen. Matthew Ridgway, but needs approval of Secretary Stevens and enabling legislation, which must originate in his office.

► **Convair's XFY-1 vertical-takeoff fighter is expected to make its first free lift-off by Aug. 10 at Moffett Field, Calif. It will be a brief vertical operation to maximum height of 20 or so feet. First full flight will not take place for another month and will be at a Navy field near San Diego.**

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Reds Strengthen Far East With MiG-17s

- **New jet fighter boosts Communist airpower in area to 7,500 planes, three times greater than FEAF.**
- **Surprise attacks from bases stretching from Siberia to China could overwhelm outnumbered U. S. forces.**

By A. W. Jessup
(McGraw-Hill World News)

Tokyo—A new Russian fighter, bigger and better than the MiG-15, is operating in increasing numbers in the Communist Far East. Designated the MiG-17, this jet fighter looks much like its older brother but is longer, faster and climbs higher.

Gen. E. E. Partridge, commander of Far East Air Forces, reveals the MiG-17's presence in this area in a review of the present Far East air situation.

He also says Red air strength in this theater now totals 7,500 aircraft, outnumbering FEAF three to one.

Even without nuclear weapons, this means Communist air forces could overpower FEAF's skilled but vastly outnumbered units with surprise attacks from the extensive Red airbase complex arcing from Siberia through Manchuria and China.

▶ **Combat Developed**—This new fighter probably results from the high-level conference held in Moscow by the Soviet fighter command in late 1951 or early 1952. At that time, the Red air leaders reviewed the deficiencies of the MiG in combat with the F-86 over North Korea.

As a result, the MiG-17 probably incorporates a boosted control system to improve its maneuverability at all altitudes and electronic sighting equipment modeled after U.S. sights salvaged from F-86s and F-84s downed in the Korean war.

Significantly, the new fighter in action in numbers means the Russians must be producing in quantity an engine with a thrust approaching 10,000 lb. The original MiG-15 engine developed 6,000 lb. thrust.

At the time, our Sabres were struggling along on 5,200 lb.

Armament of the new fighter is unknown but may well be the same as that of the MiG-15: various combinations of 37-mm. cannon and .23-mm. machine guns.

▶ **New Fighter**—The first MiG-17s were sighted in the spring of 1953. Several Sabre pilots reported at that time seeing a new and different fighter at long range. Two senior fighter commanders told this correspondent they had seen something at extremely high altitudes, perhaps 60,000 ft. or more, over MiG Alley in late June 1953. It is likely that these were MiG-17s.

Russia's new jet fighter also appeared in this year's Soviet air day display June 20 at Moscow's Tushino Airport (AVIATION WEEK June 28, p. 15).

Gen. Partridge says there just is no comparison between the MiG-15 and the Sabre. He flew the MiG-15 in which a dissident North Korean escaped last fall, while on his way to the Far East early this year. "I wish I had known then (while he was commanding the Fifth Air Force in Korea when the MiGs first went into action) what I know now about the MiG," the general laments.

▶ **Enemy Strength**—"The Communist air forces—Soviet, Chinese, and North Korean—are for practical purposes one and the same," Partridge reports in his assessment of potential enemy air strength.

"They have in this area over 7,500 aircraft of various types, and with the extensive airbase complex available to them, they should be able to shift their aircraft around to achieve considerable flexibility."

Of his own force, Gen. Partridge states: "At present, FEAF is the best-trained, best-equipped, most powerful battle-tested tactical combat force in the world."

Commenting on the problem of committing U.S. airpower elsewhere in Asia, he says: "The situation is radically different today from that which existed in the early months of the Korean war. Then we struggled with the conversion of an air defense force to a tactical air force in addition to obtaining the necessary facilities from which to operate. Today, we have a large tactical air force—with all the essential elements of control, communications and construction ability—in being in the Far East."

▶ **Drastic Change**—Despite the greater readiness of FEAF, Communist air strength and the ground rules of the Korean cease-fire force a drastic change upon the posture of FEAF. Two objectives are sought by Gen. Partridge:

- **Dispersal** of his forces against sudden surprise attack (Russian Il-28 twin-jet bombers are only 75 min. away from the major airbases in Japan, and only 10 min. away from bases in Korea).
- **Stability** of his personnel to maintain combat readiness.

Modern aircraft facilitate dispersal. Without them, the position in Korea would be highly untenable. No new aircraft or new weapons of any kind can be moved into Korea.

Units there, for example, cannot be re-equipped with the F-86D fighters now beginning to come to FEAF. But units are retrained in this new fighter in Japan. If trouble breaks out, these could move into Korea in less than two hours.

While this is a help, the general would like to rotate whole units into Korea for two or three months and then out. But this would violate the rules.

(One item on Gen. John E. Hull's agenda for his discussions in Washington might well be permission to waive this prohibition in the light of the Communist air buildup in North Korea in violation of the cease-fire agreements.)

Fighters are kept in Korea. But only F-86Es and Fs, F-84Es and Gs, F-94Cs and F-80s are allowed. In addition, there are some Marine F9Fs, ADs and F4Us.

FEAF Nightmare

(McGraw-Hill World News)

TOKYO—Maintaining stable personnel strength within Far East Air Forces is a daily nightmare.

All but one or two combat veterans have been rotated out of Korea. And there is not one combat-tested commander left at group or squadron level.

Each area within the command has different tours of duty for its airmen. And within each area, different tour lengths apply—depending on marital status and whether dependents are with the officer or enlisted man.

The Korean tour is 12 months. The maximum in Japan for an officer whose family is with him is 36 months. On Okinawa, it is two years, and on Guam 30 months.

▶ **Bomber Strength**—Medium bomber strength is dispersing even farther back than Japan. None ever was based in Korea.

The B-29 group still at Okinawa is scheduled for return to the U.S. soon for re-equipment. That will leave only a Strategic Air Command B-50 group at Guam. This undoubtedly will be replaced soon by a B-47 group.

Then the bombers may make trips in and out of Japan. The recent survey flight from California checked out the readiness of facilities here. But none will be stationed west of Guam.

ANG Pilot Sets New Speed Mark in F-86

Detroit—An Air National Guard pilot set a new speed record of 560.438 mph. in the first Ricks Memorial Trophy race at the Detroit annual Aviation Exposition and Air Show.

First Lt. Charles J. Young's North American F-86 streaked across the finish line of the 1,935.6-mi. race in front of the largest crowd in the history of the Detroit Air Show.

His time from Ontario, Calif., to Detroit-Wayne Major Airport totaled three hr. 27 min. 13.4 sec., including two fueling stops that took approximately six min.

National Aeronautic Assn. listed his average speed as 560.438 mph., breaking the 553.7-mph. record set over approximately the same course in the 1951 Bendix Trophy race by Col. Keith Compton.

Young says his Sabre exceeded 700 mph. at times during letdown from about 39,000 ft. near South Bend, Ind., at the end of the race.

Fourteen jets took off from the West Coast; three failed to finish. One plane failed to start. An alternate F-86 pilot was killed July 21 when his Sabre crashed during a night approach at Kirtland AFB, N. M.

707 Exclusive

An exclusive engineering report on the flight test program of the Boeing 707 jet transport appears on page 63 of this issue. David A. Anderton, Aviation Week's engineering editor, spent a week at Seattle during the test program discussing the 707 project with most of those responsible for America's first jet transport.

Anderton interviewed top Boeing officials, engineers, designers, technicians, pilots and others participating in the project and watched most of the initial test flights. A second 707 engineering report will appear Aug. 9.

Symington Warns of Red Missiles

Senator predicts Soviet will have intercontinental types in sufficient quantity in 5 years to hit U. S.

By G. J. McAllister

Congressional criticism of the U. S. missile development program continued last week as Defense Department reported progress in a U.S.-British plan to test and produce jointly certain missiles.

Developments are:

- Sen. Stuart Symington, former Secretary of the Air Force and now Democratic spokesman on air weapons, warned on the floor of the Senate: ". . . I believe that within five years there is a chance there will be enough intercontinental ballistic missiles, with hydrogen warheads, in the possession of the Soviet Union to deliver an all-out attack against the United States. . . .

"Practical prototypes of these weapons already exist."

- Defense Secretary Charles E. Wilson said U. S. and Britain are "closer" to exchanging some types of missiles for testing or production. Joint standardization on certain missiles is "very desirable," Wilson said.
- Field Marshal Alexander, British Minister of Defense, late last week completed a 10-day inspection of U. S. missile test centers and manufacturing facilities.

Marshal Alexander's visit came just a little more than a month after Duncan Sandys, British Minister of Supply, completed top-level talks with U. S. officials "with the object of securing more active cooperation in this field" of guided missiles (AVIATION WEEK Week June 21, p. 12).

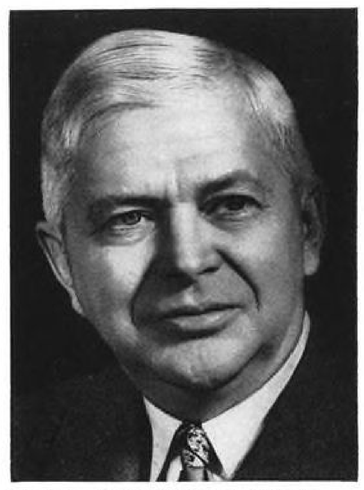
▶ **Missile Report**—These developments occurred shortly after a critical Senate Appropriations Committee report on present missile efforts. Defense Department now is engaged in preparing a report on the program for the committee. It is due in mid-January.

Trevor Gardner, Special Assistant to the Secretary of the Air Force for Research and Development, also completed an inter-service survey of guided missiles for Defense Department (AVIATION WEEK Mar. 15, p. 78). The report, still cloaked by security, is concerned primarily with the cost of missile program and elimination of duplication among the services.

▶ **Red Weapon**—Sen. Symington, a frequent and articulate critic of the Administration's "new look" defense program, again went onto the Senate floor to warn against the present program.

"The United States is not spending enough money for national defense and, what is infinitely more important, the

SYMINGTON: New armament main hope.



WILSON: Standardization is desirable.

ALEXANDER: His object, more cooperation.

money that is being spent is not being allocated to provide the weapons most needed," Symington said.

"Within a few years it will be possible to deliver atomic and hydrogen weapons by long-range intercontinental ballistic missiles, descendants of the old German V-2.

"That weapon was most effective over 10 years ago—and it is dangerous to our national security that since then we have not followed the Communists in concentrating on its improvement."

Symington described the Red missile:

- It will have a range of 4,000 to 5,000 mi. and carry hydrogen warheads.
- It will need protection against destruction by atmospheric friction because of its high operating altitude and rapidity of descent.
- It will be guided only during the first portion of the climb but so precisely that error in accuracy will be measured in hundreds of yards.
- It will be an impossibility to throw the missile off course as it approaches the target since it is not dependent, at that stage, on guidance systems.

"The elaborate and expensive systems of radar defenses we are urged to build would be utterly useless against such a missile barrage. . . . No workable method of intercepting or deflecting them has been devised, even in theory," Symington said.

". . . For the first time in their history, the American people must now face up to the real meaning of vulnerability. Today nations could be destroyed as quickly and as completely as in the past a battalion of soldiers could be defeated, or a ship sunk."

Symington's solution: "Our main hope would appear to be concentration on the development and production of the new armament."

► **'Realistic Steps'**—Sen. Leverett Saltonstall, chairman of the Armed Services Committee, engaged Symington in a brief debate following the speech.

Regarding the defense program, Saltonstall asked: "Must we not proceed with realistic steps, and take the steps one by one and make them practical?"

Symington replied: "I say . . . that the senator. . . has asked me if I am in favor of an early spring. I completely agree with him."

Saltonstall: "Does the senator . . . know of any attempt on the part of the present Administration to conceal from members of Congress and the American people generally any facts it can legitimately divulge with regard to security?"

Symington: "The answer to that question is 'yes.' Does the senator . . . care to give me the third question?"

Saltonstall: "I shall leave it at that and debate the question with the senator later."

► **Missile Tour**—While Sen. Symington spoke in the Senate, Field Marshal Alexander, accompanied by top British defense officials, was visiting the Air Force Missile Test Center at Patrick AFB, Fla.

Observers noted that each point on the tour taken by Marshal Alexander was concerned wholly or partially with missile development, testing or production. In addition to Patrick AFB, Alexander visited:

- Aberdeen Providing Ground, Md., Army Ordnance Center.
- White Sands Proving Ground, N. M., Army Missile Test Center.
- Fort Bliss, Tex., Army center for anti-aircraft missile testing.
- Edwards AFB, Calif., flight test center for USAF and National Advisory Committee for Aeronautics.
- Douglas Aircraft plant at Los Angeles, where the Nike and Honest John are in production.
- Naval Missile Test Center, Point Mugu, Calif.
- Boeing Airplane plant, Seattle, Wash., where the Bomarc F-99 anti-aircraft missile system is under development.

AMC Reorganizes Procurement Setup

Air Materiel Command's Directorate of Procurement and Production was reorganized last week in an effort to increase the amount of delegated authority and permit better control over USAF's global buying responsibilities.

In a general elevation of branches to division status and of former divisions to staff level, offices were created for three new deputy directors under Maj. Gen. David H. Baker. They are:

- **Brig. Gen. William T. Thurman,** deputy director for procurement.
- **Brig. Gen. Clyde H. Mitchell,** deputy director for production.
- **Col. Vincent T. Cannon,** deputy director for mobilization planning.

The three new deputies, according to Gen. Baker, will have functions "similar to those of vice presidents charged with corresponding responsibilities in industry. Consequently, this will make industry's problem in dealing with us easier since points of contact will be comparable."

► **Operations Increase**—The general says the reorganization was necessary because "of the many new responsibilities with which the directorate has been charged since 1948. These include decentralization of a large percentage of procurements and a vastly increased span of operations in offshore procurement and production."

In addition to the deputy directors, last week's change created six new divisions by consolidation of activities formerly carried out by branches. These offices are responsible directly to Gen. Baker but will report to the deputies on all activity involving procurement, production or mobilization.

The six new divisions:

- **Aircraft,** headed by Col. Hugh H. Bowe, will consist of three branches: bombardment, fighter and cargo and special aircraft.
- **Aeronautical equipment,** headed by Col. Ellis H. Wilson, with four branches: powerplant, communications and photographic, armament and accessories. This group takes over functions of the old aeronautical equipment and electronics branches.
- **Airlines,** maintenance and service contracts, headed by Lt. Col. Robert E. Lee, has five branches: airlines, aircraft and engines, services, equipment and research and development.
- **Readjustment,** headed by Col. William H. Harrell, with three branches: termination, settlement and plant clearance.
- **Support,** headed by Col. James W. Clark, has four branches: requirements control, equipment distribution, contract reporting and bailment, contract distribution and files. These are operating functions of the old procurement support branch.
- **Industrial resources,** headed by Col. Henry G. MacDonald, with three branches: resources, equipment and preparedness—all fields formerly handled by the Production Resources Division.

Under the new organization, research and development purchases previously handled by the research and development branch will be assigned to the appropriate buying division.

► **New Assignments**—Gen. Thurman, shifted to his Dayton assignment from Norton AFB at San Bernadino, Calif., is responsible for surveillance over USAF purchasing activity all over the world, including field procurement, local purchases by other commands, overseas buying and major ARDC procurement.

Gen. Mitchell, deputy for production, has served as assistant to the director and chief of the old Procurement Division since he came to AMC headquarters in 1952. He now is in charge of production functions, also on a global basis. He will be responsible for manufacturing resources such as machine tools, facilities, manpower and materials in support of current production programs.

Col. Cannon, now in charge of mobilization planning, comes to AMC as a recent graduate of the Industrial War College. His position is an indication of the new emphasis being placed on mobilization plans, a subject previously under the Production and Resources Division of the directorate. He will review, evaluate and disseminate mobilization requirement schedules for the aircraft industry.

VICTOR in battle with Communist fighters off Hainan was Douglas AD-4 Skyraider.

VANQUISHED was La-7 piston-engine fighter, improved version of Russian La-5 pictured.

U.S. Alert to New Red Air Attacks

There was no attempt at the Pentagon last week to minimize the seriousness of an air fight between two Communist La-7 fighters and three U. S. carrier-based planes off Hainan Island in the South China Sea.

The La-7s were shot down in a fight with two Douglas AD-4 Skyraiders and a Chance Vought F4U-5N Corsair when the latter were attacked while searching for survivors of a Cathay Pacific Airlines DC-4, downed three days earlier by a Red fighter.

The U. S. was inclined to take a dim view of any argument it was an isolated case.

► **Explosive Mixture**—The clash was not wholly unexpected, as evidenced by the quick action by the Navy planes. They shot down the two Red planes before a group of Navy jet fighters flying cover could go into action.

AVIATION WEEK predicted Apr. 19 (p. 12) that an explosive airpower mixture was brewing in Southeast Asia.

Adm. Felix B. Stump, commander of the Pacific Fleet, said the U. S. planes acted in accordance with Navy policy of firing back when fired upon.

Chinese Reds charged that the U. S. "violated" the air over Hainan Island. Defense Secretary Charles E. Wilson said the battle occurred outside the 12-mi. area off Hainan.

U. S. State Department protested to the Chinese Red government, through British diplomatic channels, the "criminal" and "deplorable" attacks.

► **Bi-Partisan Nod**—The Navy's action brought bi-partisan approval from Congress. Failure to fire back might have misled the Reds to believe Americans would not fight, said Sen. Homer Ferguson. That summed up most of the congressional reaction.

Wilson said the planes were operating from the carriers Hornet and Philippine Sea.

Navy later said all three planes came from the Philippine Sea. Observers noted that presence of the carriers means that the First Fleet now has joined the Seventh Fleet in Asian waters. First Fleet had been based at San Diego.

Wilson's statement said the La-7 is a "low-wing, single-seat fighter, reported to be one of the Communists' fastest propeller-driven fighters."

Defense Fights Tax Levied on Aircraft

Los Angeles—Defense Department has protested the more than $130 million in county tax assessments levied against local aircraft manufacturers for planes and other equipment being produced for the armed services.

Los Angeles County has insisted it has the right to make personal property assessments on such items, contending that they are the property of the manufacturer before they are turned over to the government.

Spokesmen for the three branches of the Defense Department appeared before the county board of supervisors to protest the assessments. Col. Robert Hunter of USAF's Judge Advocate's office spoke for the Air Force and Army, while Cmdr. Jerry Siefert of the Navy Judge Advocate General's Office appeared for the Navy.

They pointed out that contracts between the government and the manufacturers call for passage of title to the federal government and therefore the items should be exempt.

The board last year denied protests of the aircraft manufacturers on the same issue.

The decision has been appealed to the courts.

New Airport Financing Set Up by TWA Base

In an unusual deal that may set a precedent for future airport financing, Kansas City, Mo., has sold $18.7 million in airport revenue bonds to finance overhaul base facilities for Trans World Airlines.

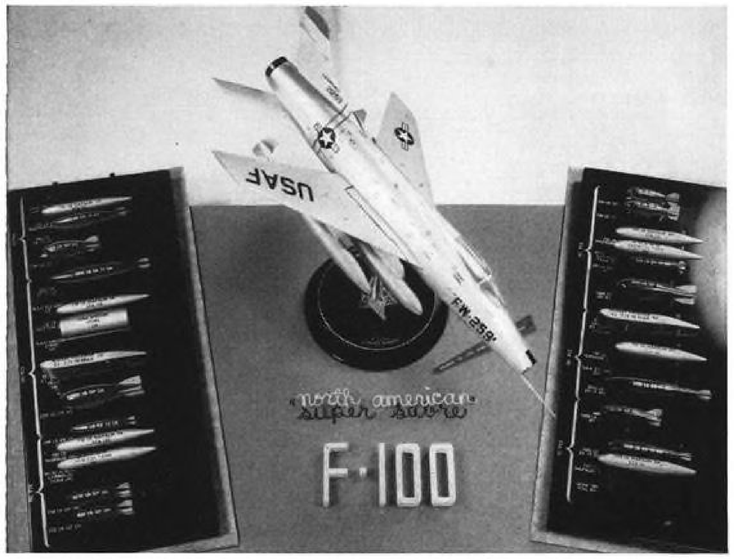
The repair base will be built at the proposed Mid-Continental International Airport, 15 miles away from downtown Kansas City. Under the terms of the deal, TWA will lease the facilities for 30 years, starting Jan. 1, 1957, or from the date construction is complete, if that is sooner (AVIATION WEEK Apr 12, p. 82).

► **Additional Security**—Rentals are set at a level to pay interest on the bonds and to retire them as they mature. As additional security for the bonds, Kansas City pledges operating income of its airports. It also promises to build runways and make other improvements.

In effect, Kansas City is lending its credit to TWA for construction of the overhaul base. Since interest on bonds of states and local governments is exempt from federal income tax, they usually can borrow at a lower rate than private companies. Furthermore, municipally-owned property normally is exempt from local property taxes.

► **Hefty Interest**—It cost Kansas City a hefty rate of 4.35% to borrow the money due to the unusual financing.

But TWA should be able to rent its base facilities on very favorable terms. By so doing, the airline avoids tieing up its own capital. And its rental payments are tax-deductible as operating expense.



F-100 MODEL DISPLAY shows variety of armaments NAA's supersonic fighter can carry.

"SPECIAL STORE" contains atomic weapon. Shape slows weapon's fall to allow getaway.

AF Shows F-100A With A-Bomb

Atomic bombing capability of the North American F-100A Super Sabre has been revealed inadvertently by the Air Force in a model display of the aircraft and its armament in a 4th floor Pentagon corridor near the Office of USAF Chief of Staff Gen. Nathan F. Twining.

The Super Sabre model was flanked by 25 models of the bombs, rockets and "special stores" that can be launched or dropped by the aircraft. The "special stores" refer to atomic weapons.

► **High-Drag Shape**—Another feature of the display was the new configuration of bombs for use at supersonic speeds. Air Force said the streamlined design to cut down drag is a Navy Department development.

The "special stores" weapon has a high-drag shape. Size of the atomic package indicates that it would be employed in troop-support actions.

Indication of the Super Sabre's versatility as a fighter-bomber is evident in the list of weapons which includes:

- 500-, 1,000- and 2,000-lb. high-explosive supersonic bombs.
- Mighty Mouse folding-fin rocket packages carrying 45 of the 2.75-in. weapons.
- 750-, 1,000- and 2,000-lb. general purpose bombs.
- 750-lb. napalm bombs.
- Chemical tanks to mark targets.

► **Auxiliary Fuel**—Four auxiliary fuel tanks, carried under the wings have been added to the F-100A to increase its range. The four tanks carry approximately 1,000 gallons of fuel, according to information stenciled on the model tanks.

The two inboard tanks are attached to specially designed pylons extended forward to keep the weight of the fuel close to the plane's center of gravity. The outboard tanks are streamlined for highspeed operations. Presumably the inboard tanks are used for takeoff, climb and early cruise operations. They are jettisoned before flying at higher speeds.

The weapons are attached to the wings at three stations on either side.

Selection of the North American F-100A as a fighter-bomber replacing the Republic F-84F was made earlier this year (AVIATION WEEK Feb. 8, p. 14).

MATS to Begin Tests On Six Turboprops

Norton AFB, Calif.—Military Air Transport Service wound up a command-wide flight safety conference last week, prepared for an all-out "debugging" program on new turboprop transports soon to be phased into the MATS operation.

Lt. Gen. Joseph Smith, MATS commander, said the transport service soon will have six turboprop aircraft under test, including military versions of the Boeing Stratofreighter, Convair 340 and Lockheed Super Constellation.

"We would like to dive into a turboprop program and spend as much time as possible on debugging before the turboprop is generally accepted," he declared.

► **Safety Record**—Gen. Smith underscored the importance of a flight safety program for forthcoming turboprop aircraft by citing the impressive MATS safety record for the past 18 months. During that period, he reported, the transport service carried nearly 800,000 passengers without incurring a single fatality.

He attributed this record to increased emphasis on training, improved communications, more efficient maintenance, modernization of flight procedures and good air discipline.

MATS safety record is particularly impressive, Gen. Smith asserted, in view of its type of operation.

"We operate on a go-anywhere, anytime basis," he said.

"Our crews may fly from here to England one day and to South America or the Arctic the next, and in any kind of weather."

Gen. Smith reported MATS logged some 5 billion passenger-miles, 800 million patient-miles and 1.5 billion ton-miles of cargo in its six years of operation.

► **Important Session**—The MATS commander termed the sessions at the directorate of Flight Safety Research "one of the most important safety conferences the Air Force has ever held."

Approximately 100 USAF officers, from command to squadron level, met with representatives from Civil Aeronautics Board, Civil Aeronautics Administration, U. S. Navy and West Coast aircraft plants to study the problems of safe transport flying.

The three-day conference included discussions of accident cause factors, safety education techniques, maintenance problems, man-machine relationships, airspace control problems and weather and accident analysis. Industry representatives briefed USAF personnel on transport safety factors as well as new equipment soon to be delivered.

Air Force reported that its accident rate now is the lowest in history, down to 22 major accidents per 100,000 hours of flying for the first six months of this year. The rate in 1953 was 24 per 100,000.

Three Lines Fight New NAL Run

But National says approval of an extension to Boston and Providence would end Eastern's 'virtual monopoly.'

National Airlines' application to Civil Aeronautics Board for an exemption to extend its routes from New York/Newark north to Boston via Providence, R. I., is getting stiff opposition from Northeast, Eastern and American Airlines.

NAL wants the route in order to compete with Eastern for through passenger traffic between New England and points along its southern routes. A north extension to its present routes, says National, would reduce EAL's "virtual monopoly of New England South through traffic."

► **Northeast View**—Northeast, whose chief operating base is New England, is seeking extension of its routes south from New York to Washington, D. C., and Florida.

In a petition opposing NAL's application, Northeast says there is need for elimination of Eastern and National's "joint monopoly" of air traffic between New York and Florida.

The New England airline's chief concern is the Board's power to grant exemptions in order to extend an airline's routes. Northeast cites CAB's decision of May 25, 1950, as "conclusive an answer as could be desired . . . to accomplish by exemption that which can be appropriately considered only by a certification proceeding."

The Board determined at that time: ". . . issuance of a certificate of public convenience and necessity is and must be the principal means of authorizing air transportation and that power to grant such authorization through exemption is sharply restricted and is to be employed only in an extraordinary case."

► **'Richest' Airline**—Eastern is fighting National's application on the basis that NAL already is "relatively the richest of the domestic carriers with the most phenomenal growth in the industy."

EAL told the Board: "It was not until Oct. 5, 1951, seven years after Eastern began serving New England and seven years after National began service to New York, that National filed an application to serve Boston. And not until July 12, 10 years after it began New York service when it added Providence to its pending new route application, did National apply to serve that city.

"Quite obviously the condition existing for seven years and under which National grew, prospered and reported the highest returns on its investment of any carrier, do not constitute an undue burden on National.

"The Board certainly cannot respond to those cries of the nation's comparatively most prosperous carrier until it is spread over every segment on more than half the continent," said Eastern. "National has already received enough to establish it as the carrier with the competitive advantage."

To support this point, EAL cites five different route cases in which National got what its competitors considers the rewards:

- **Florida case,** 1946. CAB denied Eastern a direct over-the-Gulf route and gave it to National so as to insure NAL's "achievement and maintenance of economic self-sufficiency."
- **Latin American service case,** 1946. Certification of National from Miami and Tampa to Havana instead of Eastern would establish balanced competition, the Board contended.
- **Middle Atlantic area case,** 1948. EAL charges National again was rewarded here by being authorized by CAB to "duplicate and triplicate" Eastern's Baltimore, Washington and Richmond service.
- **Capital-National interchange case,** 1949. CAB "acceded" to National's claims of competitive disadvantage and rewarded NAL with a Capital interchange arrangement.
- **Southern service to the West,** 1951. EAL claims National now diverts all of the important Florida-West Coast traffic formerly carried by Eastern through concessions to NAL, which provided a transcontinental interchange.

Eastern says that, while National does not serve New England directly, it has "end-on connections" with EAL's unrestricted New England competitors, Northeast and American, both of whom exchange passengers with NAL at New York.

American also can exchange its New England-Florida passengers with National at Philadelphia, Baltimore, Washington and Richmond, says Eastern.

As to its New England service, EAL cites these figures of Boston-Providence seats presently provided:

- **Boston,** more than 1,000 seats daily or approximately 400,000 per year in each direction.
- **Providence,** 200 southbound seats and 160 northbound daily or approximately 130,000 annually.

In addition to its service, Eastern says American and Northeast provide many hundred additional seats. Service to both Providence and Boston already is sufficient, says EAL.

"National's existing inability to serve Boston and Providence places it at no more of a competitive disadvantage and under no more of an 'undue burden' than Eastern is now placed by not being able to serve Havana and Key West in competition with National," Eastern claims.

► **EAL-NAL Sparring**—American told the Board that National's contention that it can not compete effectively with Eastern at present between the Southeast and New England cannot serve as a basis for granting an exemption.

"This application should be recognized for what it is—part of the sparring between National and Eastern preliminary to the main bout which begins when it eventually comes time for the Board to consider the New England problem," American says.

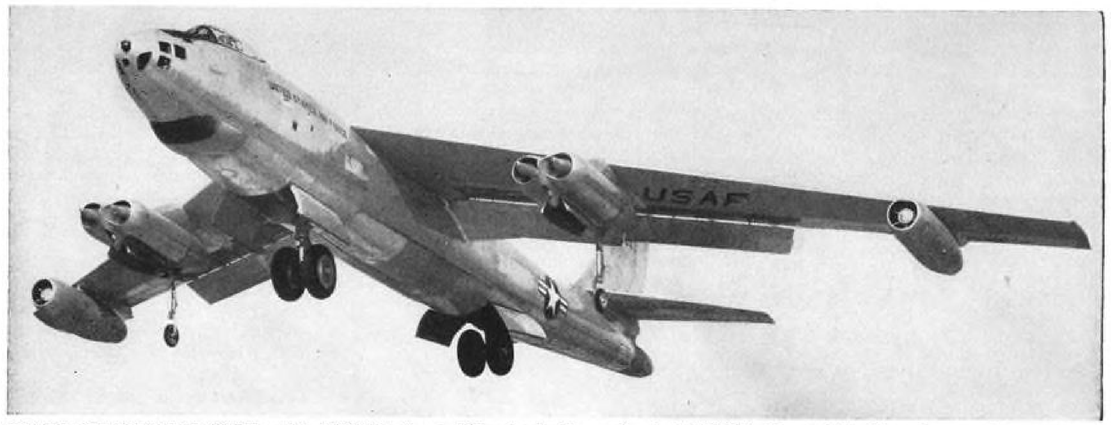
TEAL Goes to DC-6s On Australia Routes

(McGraw-Hill World News)

Melbourne—Tasman Empire Airways, Ltd., has converted Australia-New Zealand services to Douglas DC-6s acquired from British Commonwealth Pacific Airlines and discontinued operating flying boats. Included in the new services are aircoach flights.

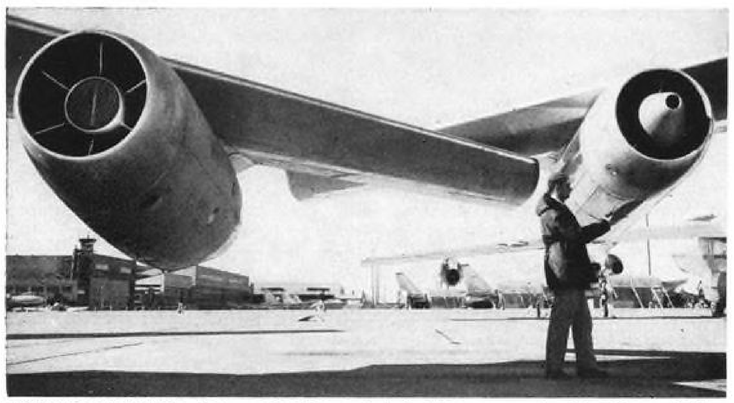
With its DC-6s, TEAL is flying Sydney - Auckland - Christchurch and Melbourne-Christchurch. The direct air link between Wellington, N. Z., and Australian cities has been dropped, forcing passengers to use the domestic service, New Zealand National Airways.

TEAL has carried more than 232,000 passengers between Auckland and Sydney since its first flight in 1940. During this period, the carrier's flying boats have flown more than 12 million miles and carried about 4 million lb. of mail and 4.25 million lb. of cargo.



COMPOSITE-POWERED B-47B, with 10,000-lb.-thrust J57s at wingtips and paired 5,200-lb.-thrust J47s inboard, gets off ground fast.

B-47 Labs Step Up J57 Altitude Tests



WINGTIP-MOUNTED J57 on B-47B test bed (left) is compared with J47 on B-47.

READY FOR HOOKUP to B-47B's wingtip, uncowled J57 undergoes Wichita check.

Boeing Airplane Co. has converted two B-47B Stratojets to flying test beds for accelerated high-altitude flight trials of Pratt & Whitney Aircraft J57 turbojets used in the huge B-52 Stratofortress (AVIATION WEEK Mar. 22, p. 9).

Technical observers believe the program is aimed at increasing the altitude ceiling of the B-52, currently understood to be limited by powerplant rather than by aerodynamic considerations.

► **Reworked Pods**—Each of the modified B-47Bs contains a single J57 in each outboard pod, replacing the standard General Electric J47-11 turbojet. Pods are of reworked B-52 design, modified to hold a single powerplant instead of the paired units on the big bomber.

One of the converted Stratojets now is being flown by pilots of the Flight and All-Weather Testing and Evaluation Branch at Air Research and Development Command's Wright Air Development Center. The second plane is at Boeing's Wichita Division.

These engine tests are part of a continuing program of high-altitude work being done by Boeing and the Air Force on the XB-52 and YB-52 bombers in Seattle. For reasons of economy in testing, Boeing engineers decided to mount the J57 engines on the B-47 for these special tests rather than to use either of the B-52 prototypes.

► **Simple Job**—Modification of the Stratojets was done at Wichita.

Boeing says it was a relatively simple job, attributable to the podded powerplant pioneered by the firm. Standard inboard pods with paired J47 engines are retained in the test airplanes.

Installation of the powerful J57s increases the takeoff thrust of the B-47B by about 50%. No modifications of wing primary structure were necessary to handle the doubled thrust and increased weight of the big J57. —DAA

Test Lab Screens PAA Buying

Airline bureau of standards develops ways to lengthen equipment life, saving thousands of dollars annually.

Behind the operation of Pan American World Airways' system is the "Chem Lab" in Miami, Fla., which has assumed a vital role as PAA's bureau of standards.

There is hardly a facet of PAA that has not been subjected to the laboratory's scrutiny in the past 24 years. Originally established in 1930 to test gasoline samples sent from PAA's domestic and overseas storage tanks, the lab's duties have been extended considerably with the rapid advance of commercial aviation.

▶ **Gas Tests**—Gasoline testing still is a vital part of the operation. Some 400 samples are flown into Miami annually. PAA's chemists, headed by Joseph T. Hendren, give each sample extensive tests to check octane rating, volatility, lead and gum content.

Because its gasoline supplies are stored in so many different climates under such radically different conditions, Pan American finds this frequent testing pays dividends in engine operation, maintenance and passenger safety.

Fuel must meet PAA's specifications. If tested samples indicate some faulty element, the particular tank from which the sample was taken may be closed down temporarily until the situation is remedied.

The higher the consumption rate at any one station, the more frequent the gasoline is tested. At both Miami and New York's Idlewild International Airports, samples are taken once a month. But at Port-of-Spain, Trinidad, tests are made every three months.

"In this way," says Hendren, "it is possible to maintain rigid control of our gasoline supplies. Pan American has established its own standards. Our problem is to keep constant vigilance of those standards."

▶ **Rigid Standards**—It is not enough for Hendren's staff that an item carry the approval stamp of Civil Aeronautics Administration. It must measure up to PAA-established standards as well, which may go beyond those of CAA, according to the airline.

Pan American, organized 11 years before the Civil Aeronautics Act was written, believes it should rely on its own experience in such matters. The Chem Lab was opened eight years before the Act existed.

Fuel testing, although still a very vital function of the lab, in recent years has been outflanked in proportion to various other activities that have come up as new problems were experienced.

"We are always ready to set up a new test when a problem exists," says J. E. Mykytka, assistant chief chemist.

▶ **Equipment Savings**—Long hours of research usually go into a problem before the actual test may be established. One major problem that has been solved in recent months involved the blue covers on transport seats.

It was discovered that after two years' wear, the nylon covers still were serviceable although seriously faded. Officials figured something must be done if cabin interors were to retain their uniform color scheme.

To discard seat covers before they were sufficiently worn would be expensive. Replacing the covers would cost roughly $50 per seat in the DC-6B.

After considerable testing, chemists

Italians Test New Jet Trainer

First view of the prototype Fiat G-82 jet trainer now being tested at Cancelle Airport for the Italian air force. The G-82 is powered by a 5,000-lb.-thrust Rolls-Royce. Nene and is a development of the G-80 powered by a 5,000-lb.-thrust Rolls-Royce Tiny fences are visible at the wingtips just inboard of the tanks. The G-82 has a design gross weight of 13,800 lb., and has a top speed of 565 mph.

found a dye that could lengthen the life of the covers at least another year at a cost of $5 per seat. Thus lab experts saved the airline thousands of dollars a year in seat covers alone.

Another saving chemists brought about is that of reclaiming Skydrol hydraulic fluid used in DC-6s. By establishing a filtering process, they reclaimed used Skydrol for about 50 cents a gallon. When new, the hydraulic fluid costs $12 a gallon.

► **Screening Tests**—New materials and items the airline considers buying are subjected first to rigid tests by the Chem Lab. Manufacturers send in samples of their wares. If they withstand the PAA screening test, they will be bought.

Everything from curtain material to evacuation chutes and detergents used to clean materials is checked by the lab. Because of the extremes of climatic conditions experienced by Pan Am on its worldwide routes, the chemistry experts also must test the effects of mildew on materials.

One seat belt out of every 100 bought by PAA gets an extensive stretchability test to determine at what point the belt will break.

► **Weathered Trials**—Not long ago, Pan American began receiving considerable complaints from passengers that the free overnight bags the airline issues were not holding up when passengers attempted to use them after the flight was finished.

Even though the bags were distributed free, PAA set its chemists on the trail of the faulty fabric and now is issuing a much more expensive nylon bag to its passengers. So far there have been no complaints.

Such small matters as the nozzles on aerosol insecticide bombs used to spray cabin interiors were checked because they were inclined to rust in tropic climates. Now the nozzles are made of a metal alloy that will not rust under tropical conditions.

In every such test, the chemists must duplicate the conditions needed in the laboratory. If need be, an entire room will be "weathered" according to the climate desired in order to test a product or item or use.

► **Miniature Bureau**—With all of its varied assortment of jobs in past years, PAA's Chem Lab has taken on the look of a miniature Bureau of Standards.

About 33 items a month are sent to the lab for study. Tests may require weeks and more often months before the solution is reached.

"Each new item poses new problems for us," Hendren says. "As the aviation industry grows more and bigger problems are presented, we must continually justify our existence and reexamine ourselves." —RB

Court Clamps Lid On Pilot Pay Talks

(McGraw-Hill World News)

Melbourne—A news blackout has been imposed on certain portions of hearings in federal arbitration court here on Australian airplane pilots' demands for higher pay.

Some of the pilots' disclosures in earlier hearings about conditions and accidents are believed to have come as a shock to newspaper readers, and the court has conducted some of the testimony in secret.

The requested new pay scales are said to be more in line with those of other countries, although still below U. S. standards. All of Australia's airline operators are reported opposed to the increases.

Judges of the court have gone aloft in Convair-Liners, DC-6s, C-54s and in smaller planes so that they might become more familiar with various piloting conditions.

Canadian Copter Line To Carry Passengers

Vancouver, B. C.—Okanagan Helicopters plans to inaugurate Canada's first scheduled copter passenger service, flying Sikorsky S-55s to communities north of here on British Columbia's Pacific coast.

Airline president Glenn W. McPherson says the flights will be started immediately after the proposal is approved by Canada's federal government.

Okanagan's first scheduled service will be to Prince Ruppert, Terrace and Kitimat.

"We are anxious to enter the passenger field with the largest machines now available" McPherson says, "in anticipation of extending these operations as soon as the S-58, a 14-passenger helicopter, and the S-56, a twin-engine machine carrying an estimated 30 passengers, become available in the next two to three years."

Okanagan is Canada's largest commercial helicopter operation, has logged more than 15,000 hr. during the past seven years. Last year alone, more than 9,000 passengers were carried in business and industrial services.

William Boeing Sells 19,100 PNA Shares

William E. Boeing, Jr., has sold 19,100 common shares of Pacific Northern Airlines, the biggest single stock transaction in the aircraft industry between Apr. 11 and May 10, according to the Securities & Exchange Commission.

Boeing's sale leaves him with a total of 16,666 common shares. Joseph H. Foster, a PNA officer, sold 1,200 common shares, leaving a total holding of 1,400.

Other stock transactions that were reported include the following:

Aero Supply Mfg. Co., Inc.: Henry M. Margolis, director, bought 21,000 common shares, making a 15,200-share total: Leo Strauss, director, bought 300 common shares, making a total holding of 8,893 shares.

Beech Aircraft Corp: John A. Elliott, officer, bought 100 common shares, making a 200-share holding.

Bell Aircraft Corp: Lawrence D. Bell, president and general manager, bought 10,000 common shares, making a total holding of 11,000; Harvey Gaylord, officer, bought 200 common shares, making a 600-share total; William G. Gisel, officer, bought 200 common shares, making 350; Walter A. Yates, director, bought 189 common shares and sold 25, leaving a total holding of 2,000 shares.

Bellanca Aircraft Corp: James J. Sullivan, director, bought 1,000 common shares, making a holding of 1,000.

Boeing Airplane Co.: C. L. Egtvedt, officer, sold 4,000 capital shares, leaving 4,750.

Capital Airlines: George R. Hann, director, bought 2,000 common shares, making a 41,572-share holding; Raymond G. Lochiel, officer, acquired 385 common shares through exercise of option, making a total holding of 5,800; Thomas D. Neelands, Jr., director, bought 800 common shares, making 4,000.

Colonial Airlines: Joseph Shields, director, bought 200 common shares and sold 200 during the same period, leaving 500.

Consolidated Vultee Aircraft Corp (now Convair Division of General Dynamics Corp.): G. T. Bovee, officer, sold 300 common shares leaving a 700 total; John Hertz, director, bought 2,850 common shares through Lehman Bros., making a 12,350-share total.

Fairchild Engine & Airplane Corp: A. F. Flood, officer, bought 300 common shares, making 1,000.

Flying Tiger Line, Inc.: William E. Bartling, officer, sold 108 common shares, his total holdings; Bartling bought $10,000 of 5½% convertible debentures during the same period, making a $55,000 holding of that type.

General Dynamics Corp: In exchange for Convair common stock, which merged with Dynamics, the following officers received this stock: John Jay Hopkins, 114 shares, making a total holding of 1,166; Clifton M. Miller, 285 shares, making 1,335; Frank Pace, Jr., 114 shares, making 114; L. B. Richardson, 200 shares, making 1,001; O. P. Robinson, Jr., 114 shares, making 3,761.

Lockheed Aircraft Corp: D. E. Browne, officer, bought 1,155 capital shares, making a 3,018-share total.

Lear, Inc.: H. C. Andrus, officer, received 281 common shares as incentive bonus, making a 769-share total; F. D. Beamer, officer, received 164 common shares, making 315; Albus Durham, officer, received 331 common shares, making 636; Philip E. Golde, officer, received 413 common shares, making 10,237; A. G. Handschumacher, officer, received 566 common shares, making 1,067; Frederick J. Harrison, officer, received 167 common shares, making 308; Albert C. Keske, officer, received 179 common shares, making 647; William P. Lear, director, received 1,135 common shares, making 410,597; Richard M. Mock, officer, received 778 common shares, making 6,033; Paul Moore, officer, received 555 common shares, making 912; George K. Otis, officer, received 346 common shares, his total holding; Albert A. Rorison, officer, received 113 common shares, making 140.

Glenn L. Martin Co.: Jess W. Sweetser, officer, acquired 2,000 capital shares through exercise of option, sold 200 capital shares, leaving 2,000.

National Aviation Corp: Frederick F. Robinson, officer, sold 100 common shares, leaving 200.

Northrop Aircraft, Inc.: Kenneth P. Bowen, officer, acquired 100 common shares through exercise of option, his total holding; George Gore, officer, acquired through option 630 common shares, making 822; John W. Myers, officer, acquired through option 1,330 common shares, making 3,266.

Pan American World Airways: Franklin Gledhill, officer, sold 1,650 capital shares, leaving 1,486.

Ryan Aeronautical Co.: Emtor, Inc., beneficial owner, bought 1,100 common shares, making a total holding of 85,100 total.

United Air Lines: Gardner Cowles, director, sold 2,000 common shares through Register & Tribune Co., leaving 2,300.

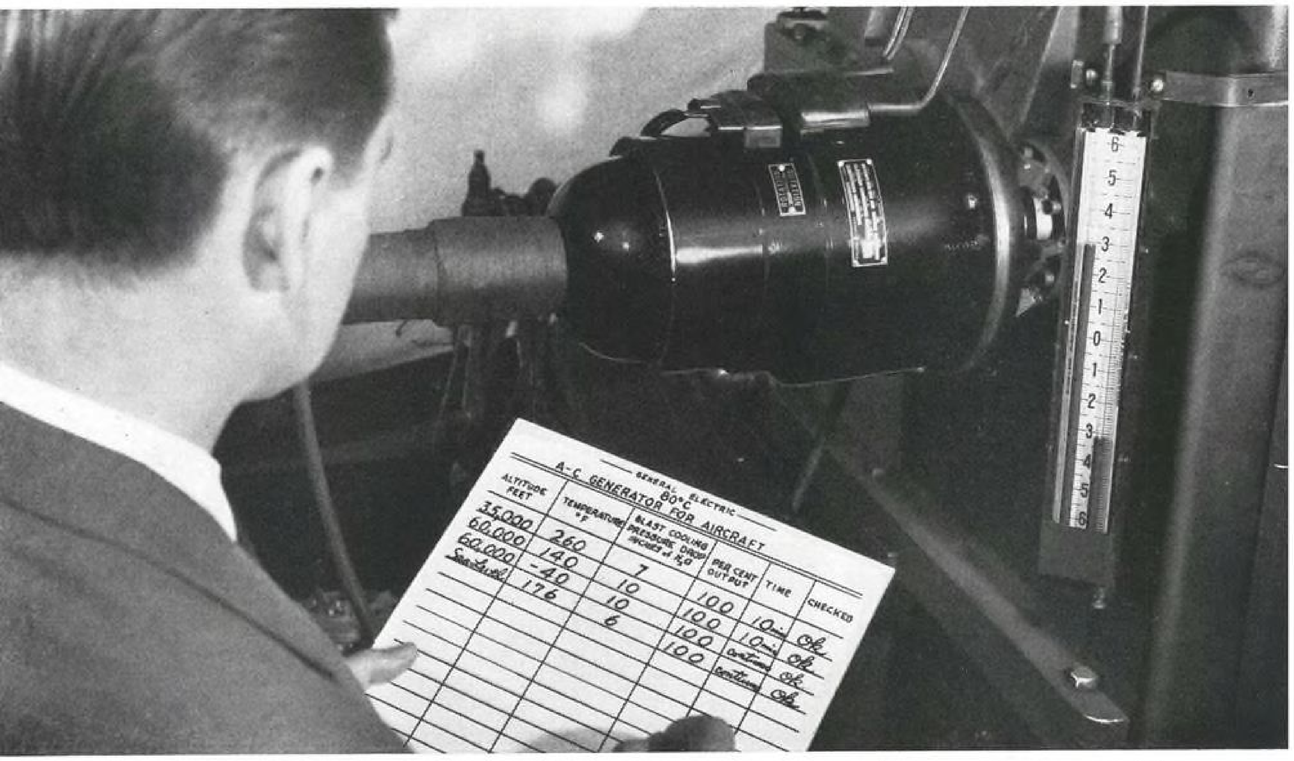
United Aircraft Corp: William P. Gwinn, officer, bought 3,700 common shares, making 5,480; Lauren D. Lyman, officer, bought 100 common shares, making 200; Erle Martin, officer, bought 1,000 common shares, making 3,240; Bernard L. Whelan, officer, bought 1,500 common shares, making 2,000.

United Aircraft Products: Robert K. Hart, director, sold 200 common shares, leaving 521.

Special Banshee Takes Cinerama Movies

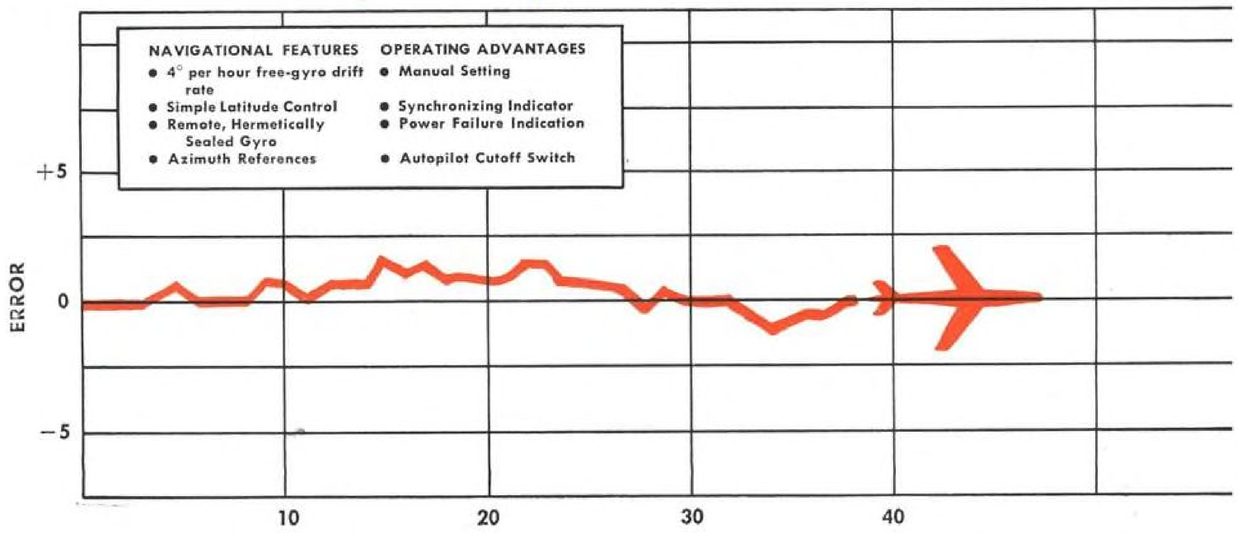
The odd-looking nose in this McDonnell F2H-3 Banshee was devised to carry a wide-angle Cinerama so that the jet fighter could be used to take action views of carrier aviation for a new Warner Bros. motion picture. Camera lens sweeps 148-deg. horizontally.

New G-E automatic a-c electrical system



New G-E high-efficiency a-c generator has no harmonic over 1%, and offers full load recovery in about 1/10 sec. Available ratings: 10 to 60 kva, 380/420 cycles, 5700/6400 rpm, 120/208 volts.

New G-E compass system reduces aircraft



Low drift of gyro system proved in laboratory and flight tests. The above drift curve was obtained during a roll-pitch-yaw test on a G-E gyro unit. This test, conducted by an outside equipment laboratory, showed that at no time did the drift rate exceed 4° per hour—66–80% reduction over previous systems. Flight test conducted later upheld the laboratory findings.

delivers load at 260F

A new, fully automatic parallel a-c electrical system which eliminates normal manual switching, and delivers rated load at higher ambient temperatures than ever before possible, has been developed for jet aircraft by General Electric.

Designed for supersonic dash

Designed specifically to meet the high ram-air temperatures of supersonic dash, this new G-E generator system provides the best voltage regulation and most advanced system protection available in production today. The automatic system delivers full load at:

- Sea level with 176 F cooling air at 6-inch water drop (continuous).
- 60,000 feet with −40 F cooling air at 10-inch water drop (continuous).
- 60,000 feet with 140 F cooling air at 10-inch water drop (ten minutes).
- 35,000 feet with 260 F cooling air at 7-inch water drop (ten minutes).

Speeds take-off, spares pilot

The first completely automatic a-c system ever produced, the new G-E equipment begins operating as soon as the pilot starts an engine. The system contains only two toggle switches, which can remain "on" at all times unless a fault develops. This eliminates a series of pilot functions, and sharply reduces time required to become airborne after the pilot climbs into the cockpit. System control and protection is fully automatic.

Single source for complete systems

General Electric offers a single source for complete a-c or d-c power generation systems for any aircraft. For more information, contact your nearest G-E aviation specialist, or write Section 210-86, General Electric Company, Schenectady 5, N. Y.

Major components of the new G-E system in addition to the generator are:

1. New static regulator (left)—designed to last the life of the aircraft though regulator is only 390 cubic inches and weighs only 13 lbs.
2. Control and protective equipment (right) automatically locates and isolates any faulty generator. Control panel weighs only 8½ lbs. for a single-generator system and only 10¼ lbs. for parallel generator systems.

drift rate 66 — 80%

A new compass-controlled directional gyro system which offers a free-gyro drift rate of only 4° per hour—66 to 80 per cent more efficient than present systems—has been developed by General Electric for helicopters and fighter aircraft.

Weighs only 17.5 lbs.

Compact and lightweight (approximately 17.5 lbs.), the MA-1 compass system is designed to meet the requirements of any synchronous course-indicator, and will operate from all compass transmitters built to Air Force specification AF-27635.

Accurate, stabilized heading information

The MA-1 system offers accurate, stabilized heading information continuously through 360° in azimuth when slaved to the earth's magnetic field through a modern remotely mounted compass.

Featuring a normal slaving rate of approximately 2° per minute during compass-controlled operation, the MA-1 system also provides for controlled latitude-drift compensation.

Aircraft systems development

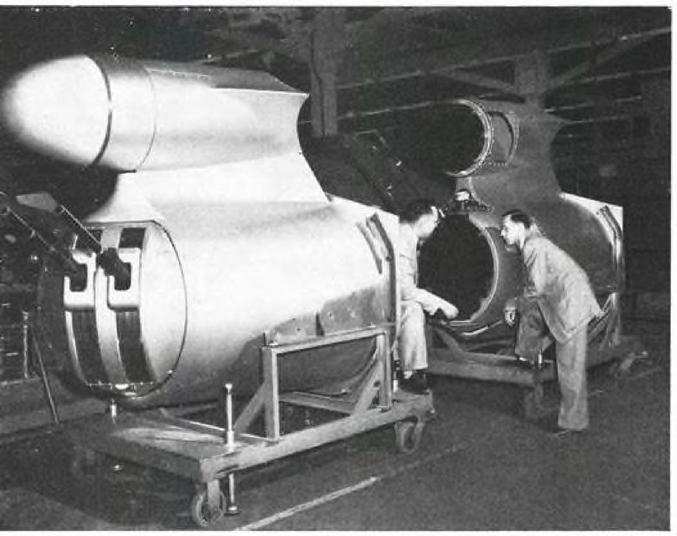
For additional information regarding reliable aircraft systems development, contact your G-E aviation specialist or write Section 210-86A, General Electric Co., Schenectady 5, N. Y.

1. Amplifier provides a junction box for various components and power source as well as containing leveling, slaving and servo amplifiers, servo unit with detector, follow-up and output synchros.
2. Controller is used in conjunction with the radio-magnetic indicator for setting directional heading and latitude control and for general operation of the system.
3. Directional gyro, heart of the G-E system, is a remote, low-drift hermetically sealed gyro used to obtain a stabilized azimuth heading.

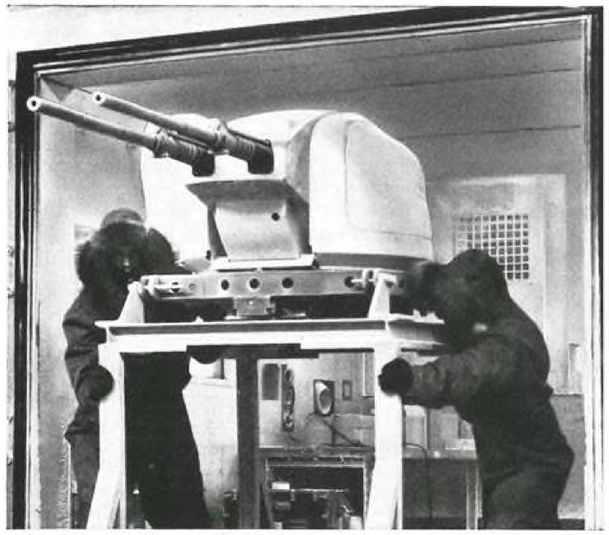
Progress Is Our Most Important Product

GENERAL ELECTRIC

New G-E armament system gives jet bombers automatic defense



This new 20 mm system is a result of G.E.'s "integrated system" approach whereby a group of engineers is responsible both for development and modification of a system for greatest efficiency and ease of maintenance.



Cold and hot chambers with temperatures ranging from —90 F to 170 F are only two of the elaborate tests G-E armaments systems undergo to help insure maximum flight efficiency.

A remote-controlled 20 mm armament system, capable of finding, tracking and hitting hostile aircraft even in the night or fog, has been developed by General Electric for high-speed jet bombers.

"Packaged" protection for B-47E and RB-47E

Under security wraps for three years, the G-E fire control system provides more reliable, automatic protection for the Boeing B-47E and RB-47E jet bombers. Compact, the 20 mm system is delivered packaged, tested, and ready to be installed as a complete tail section.

Automatic warning, tracking, correcting

The system performs the following functions:

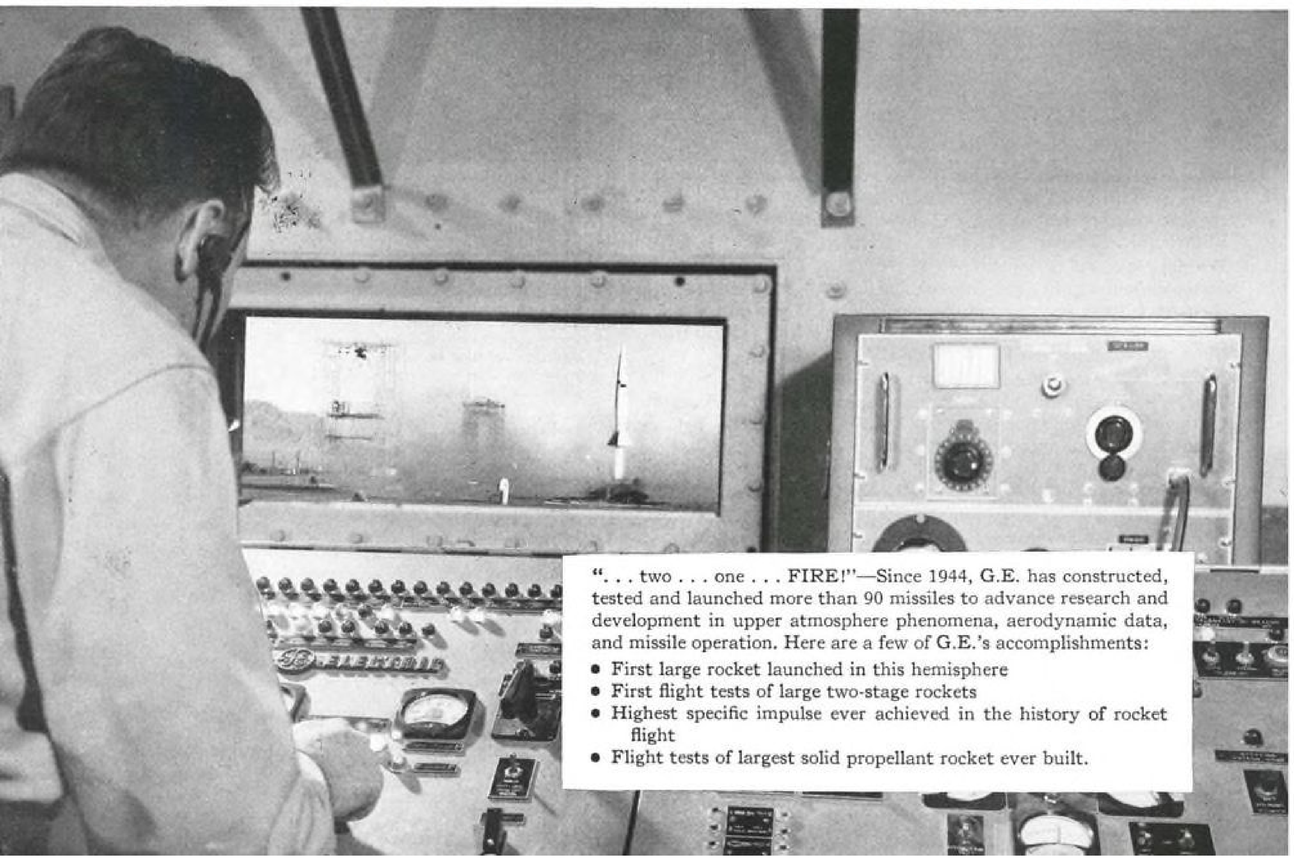
- Provides automatic radar warning of approaching aircraft
- Automatically tracks and positions guns on selected target
- Continuously corrects for windage, ballistics, and lead errors by means of an electric computing network
- Fires guns electrically when target is in range.

System Engineering

Bomber survival is increased as a result of this integrated, effective, compact system. Competent system engineering is one reason why almost every U.S. operational heavy and medium bomber today is equipped with General Electric armament systems. General Electric Company, Schenectady 5, N. Y.

Remote-controlled G-E armament system gives the Boeing B-47E and RB-47E jet bombers a heavyweight punch to the rear. Guided by radar, the 20 mm system can track and hit unseen targets.

New land-sea-air uses for rocket propulsion under study by G.E.



"... two ... one ... FIRE!"—Since 1944, G.E. has constructed, tested and launched more than 90 missiles to advance research and development in upper atmosphere phenomena, aerodynamic data, and missile operation. Here are a few of G.E.'s accomplishments:

- First large rocket launched in this hemisphere
- First flight tests of large two-stage rockets
- Highest specific impulse ever achieved in the history of rocket flight
- Flight tests of largest solid propellant rocket ever built.

Ten years ago, rocket propulsion had but one use . . . to launch missiles. But today, rocket power as a source of high pressure, high speed, high temperature gases and power can be used in such applications as torpedo propulsion, catapult energizers, high-speed flight, thrust augmentation, rocket booster and sustaining power, high-speed research sleds, glider take-off and landing, supersonic wind tunnels, mining, plus many additional latent military and industrial uses which will be brought out by research and development.

Experience, manpower and facilities make it possible for G.E. to design and develop rocket motors or rocket propulsion systems for use on land, sea or in the air.

The amazing growth of rocket propulsion offers a challenge to the ingenuity and imagination of American industry. This challenge—to apply the tremendous power of rocket propulsion to ever-newer applications—can be met only through continuous research and development. To this end, General Electric offers its successful experience, its trained manpower, and its extensive facilities. General Electric Company, Schenectady 5, N. Y. 210-86B

TORPEDO PROPULSION

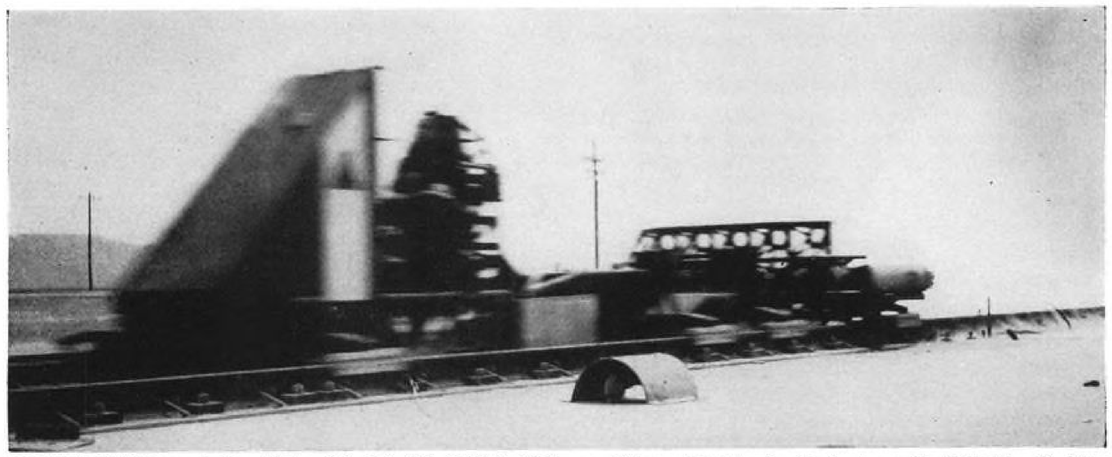
THRUST AUGMENTATION

MINING

SUPERSONIC WIND TUNNELS

Progress Is Our Most Important Product

GENERAL ELECTRIC



800-MPH. SPEED eventually will be attained in this 3,500-ft. Holloman highspeed test track. Photo shows Lt. Col. John P. Stapp in recent record-breaking 421-mph. sled run, using six 4,500-lb.-thrust rockets. Tests at higher speeds with 12 rockets are planned.

Sleds Fill Major Gap in Air Research

Construction of a new rocket-propelled test sled installation to be used by the Air Research and Development Command for testing ejection seats and escape capsules highlights the increasing role of the highspeed track as a primary research facility.

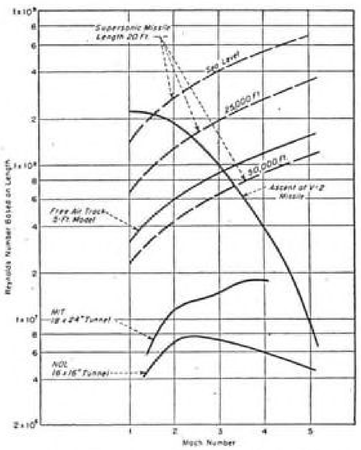
About a year from now, ARDC will begin testing on the new $2-million facility, sending test installations hurtling over the edge of a 1,500-ft.-high mesa in Utah. Sled and capsules will parachute down to the foot of the mesa (AVIATION WEEK July 19, p. 15).

The new track will be the fourth for the Command; others are installed at Holloman Air Development Center, where Lt. Col., John P. Stapp recently established an earthbound speed record of 421 mph. for manned vehicles, and at the Air Force Flight Test Center, Edwards AFB, Calif. (AVIATION WEEK Sept. 7, 1953, p. 26).

► **Why a Track**—Why a track installation? What are the advantages and disadvantages? Is it competitive with other kinds of test facilities?

The answers to these kinds of questions have been given by Gerhard Eber, scientist at Holloman Air Development Center and a strong proponent of track testing. In a recent symposium on highspeed track techniques held at HADC, Eber presented his views on the basic philosophy of such facilities.

Eber said that the track does not compete with a windtunnel, but has its own merit and can fill existing gaps in aerodynamic testing. The time to use a track, he said, is when the windtunnel does not provide reliable results because



GRAPH indicates how results of ground runs may be applied to supersonic flights.

of the lack of proper test conditions. He suggested that the real value of a track would be found for large-scale models at Mach numbers above 2.5.

► **Highspeed Railroad**—Stated briefly, a test track is simply a highspeed railroad. Steel rails are mounted on poured concrete pads or bolted to steel beams set in concrete; the construction is necessary because the track must be straight and level to minimize extraneous accelerations from bumps.

The vehicles which ride on the rails are many and varied; some of them are self-propelled, some need a pusher sled in addition to the sled containing the test installation. The term "sled" is used because the vehicles are not wheeled, but ride on slippers of magnesium bearing on the steel rail.

Thrust for blasting the sleds to supersonic speeds comes from rocket motors, single or in batteries. The sleds use either solid-fuel rockets or liquid propellants, but the trend is definitely toward the use of liquid fuels.

Deceleration of the sled and test vehicle is done with a water brake. Between the rails of the track is a long shallow trench filled with water at varying depths, controlled by a series of Masonite dams. A brake section—actually a shaped scoop—projects beneath the test vehicle and, as the end of the run is neared, the scoop picks up water.

By turning the water through curved vanes, the sled gives up its energy to the water, and thus decelerates.

► **Three Ways**—Eber pointed out that of all the existing methods of aerodynamic testing, three appear to be competitive in providing the data required for engineering design: windtunnel, free-flight and captive flight tests.

But the modern windtunnel has become a huge installation, with enormous power consumptions, and the complications of coolers and driers. For example, windtunnels with installed horsepower ratings of 200,000 are already in operation, and serious consideration has been given to installations using 1 million hp. and more.

Eber says there is a limit beyond which it is more practical to move the object through the air instead of moving the air past the object, and he believes that the time has come to reconsider

the methods used in data-gathering.

Captive flight testing gives the basic similarity parameters of Reynolds, Mach, Prandtl and Peclet numbers. The geometric scale of the model can be more easily changed than it can in a tunnel test, should there be any Reynolds numbers effects associated with change of flow in the boundary layer.

► **Track Drawbacks**—One objection to track testing has been speed control. With present rocket motors, the thrust—and therefore the equilibrium speed of the sled—can be held within pretty close limits. If for any reason data must be taken at a zero acceleration, it should be possible to trigger the data-gathering instrumentation with an accelerometer.

Another objection has been vibration of the models on the sled. Magnitude of the vibrations is not well known, and so far there has been little effort made to install vibration dampers in test sleds. But this is considered to be a problem that can be solved with existing knowledge, and is certainly no more difficult than the vibration of models in windtunnels.

► **Air-Density Effect**—The high density of the ambient atmosphere is an aid in establishing model similarity to full-scale conditions. At Holloman, for example, the track altitude is 4,000 ft., and the ratio of local density to that of sea level standard is about 0.88. In contrast, the density ratio between 40,000 ft., where the full-scale airplane may fly, and sea-level density is about 0.25.

Therefore small models, operating in a density of about three times that of the full-scale conditions, can reach full-scale Reynolds numbers because of this high density ratio. Further, the solid sea level air will produce control forces and moments which are more nearly representative of estimated full-scale values.

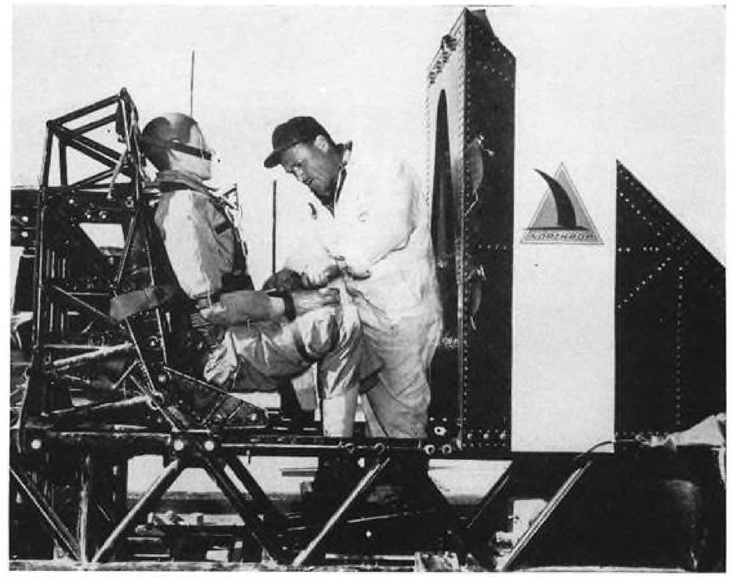
Eber cited one comparison between full-scale and model tests: A 5-ft. model on the track has the same Reynolds number as a 20-ft. missile at 40,000 ft. altitude.

Speeds on the track are not limited either. The Holloman highspeed track has already operated at a Mach number of 2.1, and is expected to go to 2.5. If you could maintain a 40G acceleration and deceleration on a 90,000-ft.-long track, a test Mach number of 5.0 could be sustained for about 10 seconds.

► **How Practical?**—Three factors determine the practical value of model test methods:

- **Initial cost for the installation of the facility.**
- **Operational and maintenance costs.**
- **Reliability and usefulness of test data.**

Cost per point of data is determined by the first two factors; this is a fair factor for the comparison of the efficiency of modern windtunnels, but comparative figures for tunnels and tracks are non-existent, says Eber.



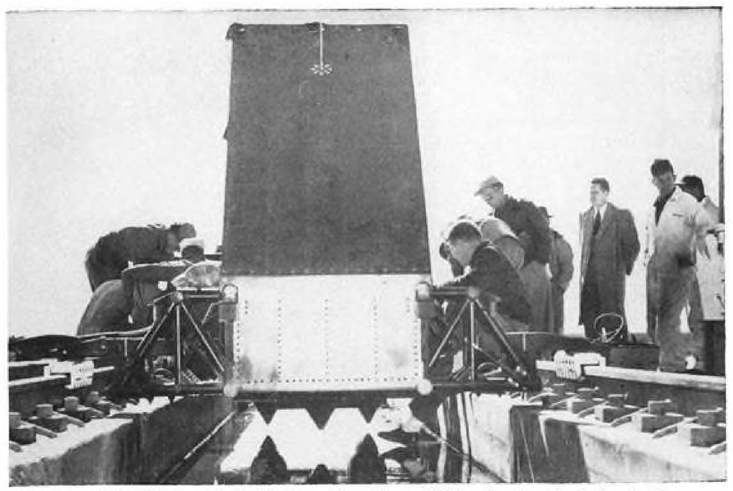
STANDIN—Life-sized dummy is strapped into seat for highspeed sled run.

STAR—Lt. Col. Stapp awaits call to start first live test on Holloman sled.

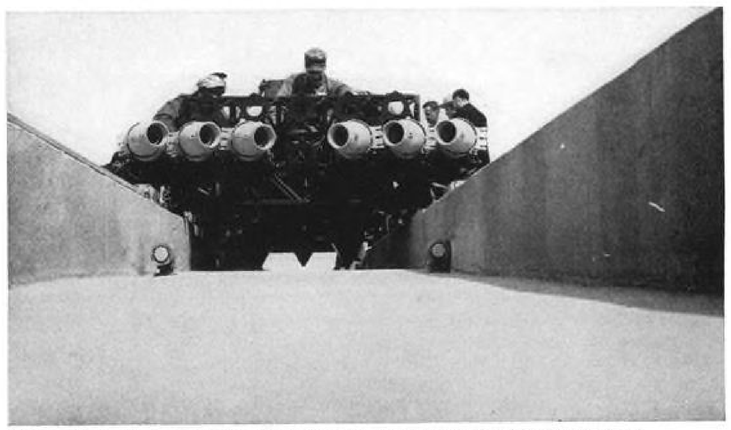
Holloman experience has taught that 50,000 ft. of tracks could be installed for about $5 million, or about $100 per ft. This does not check too well with the quoted figure of $2 million for the new 12,000-ft track in Utah, but the latter figure may include installations not considered in the original Holloman estimates.

Cost per run depends on the maximum speed of any run, in contrast to the windtunnel, where hourly test costs are nearly constant. A saving will be afforded with the use of liquid-propellant rockets, which cost something on the order of one-tenth that of solid-fuel propellant rockets. Eber expects that the average cost of fuel for track testing will be the same magnitude as the cost of power for windtunnel testing.

Then he adds this controversial statement: "Due to more realistic test conditions, the usefulness and reliability of the track test data must be considered



FRONT VIEW—Closeup of sled's forward section. Water in trough is for braking.



REAR VIEW—Twelve rockets will replace six shown here in higher-speed runs.

superior to those from the windtunnel."

Final applications and specific developments are the logical areas of research programming for a track facility, Eber says.

► **Research Areas**—Specifically, he cites these prospective areas of track research:

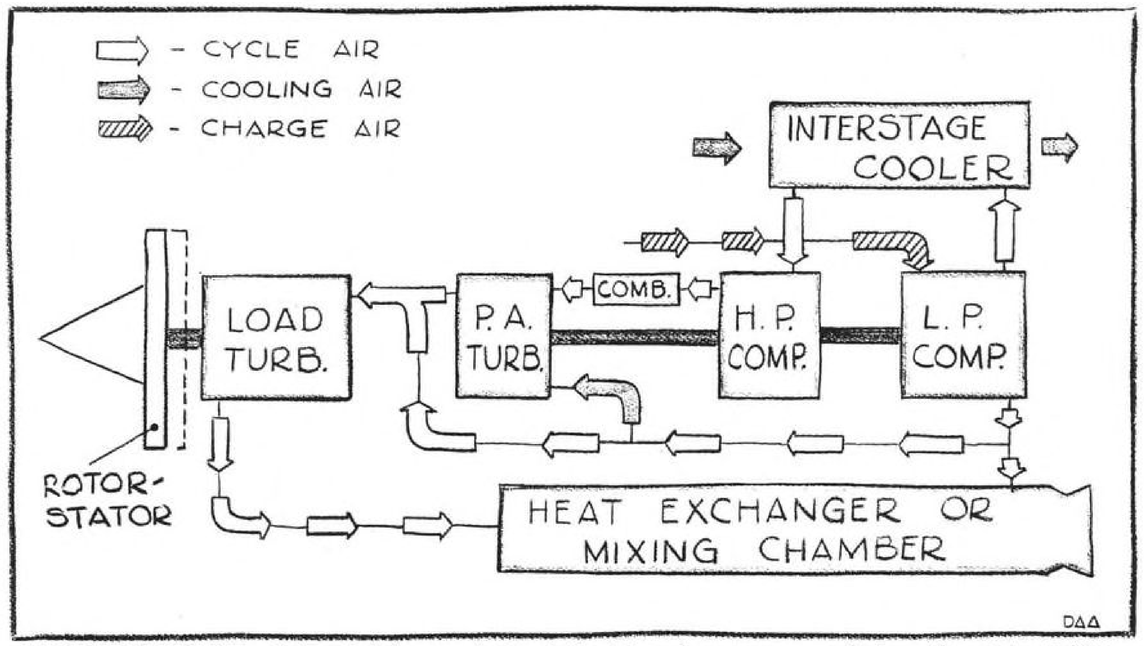
- **Replacement of sharp-pointed missle noses with rounded contours better suited for target-seeker devices.**
- **External antenna location and shape.**
- **Static and dynamic stability and control.**
- **Transfer functions** and the contributions of loop components in the automatic control systems for aircraft.
- **Ramjet development,** where it is mandatory that the aerodynamics of test vehicle and engine be clearly differentiated, and where drag must be separated from the propulsion forces. (Track testing allows ramjet work in original size but not under true altitude conditions.)
- **Aeroelasticity and flutter;** some work in the transonic region has already been done on the highspeed track at Edwards AFB.

► **'Windtunnel' Sled**—A novel design for a test sled is proposed by Eber. Instead of keeping the conventional sled idea, he proposes the use of a sled shaped like the supersonic test section of a windtunnel. This design is claimed to increase the speed range because the nozzle of the test section will produce a Mach number actually higher than the sled speed. In one case, it would be possible to get a test Mach number of 8.0 for a sled speed corresponding to Mach 5.0.

"Certainly, the concept of a moving windtunnel is a project of the future," says Eber, "but it appears that such facility is well within the scope of technical feasibility and can be achieved with reasonable expenses."

—David A. Anderton

Portions of this article were based on "The Role of the Highspeed Track as a Tool for Applied Research in Supersonic Aerodynamics," by Gerhard R. Eber, Holloman Air Development Center.



LAGELBAUER'S PROPOSAL calls for a turbofan powerplant employing twin-spool compressors, a combustor section and two turbines.

Turbofan Aims at Higher Efficiencies

A turbofan powerplant built around highly refined components and using radically higher operating temperatures is the answer to increased flight efficiency, says Ernest Lagelbauer, New York mechanical engineer.

His proposal—basically a fan with free-turbine drive plus a partial-admission turbine drive for twin-spool compressors—has been evaluated by top government and university scientists in this country. There is some disagreement on details, but the general conclusions could be exemplified by this quotation from a letter written by an official for the now-defunct Research and Development Board:

". . . The general scheme proposed for improving the overall efficiency is sound thermodynamically, and some of the details are already incorporated in Air Force developments of today."

But there the general agreement ends, and as Lagelbauer says, "If you want to start a good argument, talk about its practical possibilities." On that point there is little agreement; opinion ranges from the implication of the RDB letter that some features of Lagelbauer's system are good enough to be incorporated in current designs, to flat statements denying value in his ideas.

Lagelbauer's Engine

Let's have a look at his proposed powerplant scheme and see what the features, drawbacks and advantages are.

Briefly stated, the layout calls for a turbofan powerplant using twin-spool compressors, a combustor section and two turbines. One turbine drives the compressors, and the other, a free turbine, drives the fan.

The thermodynamic cycle is considerably different from the conventional. Lagelbauer suggests three divisions of airflow:

- CYCLE FLOW, which goes through the complete cycle of compression, combustion and power-extraction by the turbines.
- BYPASS FLOW, which is bypassed around the engine from the last stage of the low-pressure compressor and either mixed with the turbine exhaust or passed through a heat exchanger where it acquires heat from the turbine exhaust.
- COOLING AIR, which is bled from the low-pressure compressor to cool the main turbine and is then passed out through the load turbine.

Proportions of the airflow division would vary with the particular application and the flight regime; for example, in a long-range cruise condition, most of the air would be cycle air and only a small amount would be used in the bypass cycle.

This basic cycle has been given the name of Kinematic Jet System (KJS) by its inventor.

Super Temperature

One principal feature of the KJS is what Lagelbauer designates as the super-temperature dual (STD) turbine system. Its chief components are a single combustor which operates at near-Stoichiometric conditions and at a far higher pressure than conventional in gas-turbine practice, and a single-stage partial-admission turbine which operates at 25,000 rpm. This ultra-highspeed wheel drives the twin-spool compressors.

Ernest Lagelbauer is Austrian-born, graduated as a mechanical engineer in Vienna. Most of his 20-year experience in this country has been in the design of large steam powerplants; most recently he was employed by Sanderson and Porter in such a capacity.

(Stoichiometric combustion defines a condition of theoretical proportions for burning fuel in air with no excess of either; for air and a hydrocarbon fuel, this corresponds to a fuel-air ratio of about 1:16.)

But that kind of combustion means extremely high temperatures; therefore most combustion processes take place with excess air, which lowers the exhaust temperature. Lagelbauer has planned partial admission for the primary turbine; in effect, only a portion of the blading annulus will be subjected to the hot blast of the incandescent gases while the rest of the annulus will be getting the relatively cool (500F) air bled from the lower-pressure compressor.

While the cooling air passes through the turbine, it acquires enough temperature rise to qualify as an additional working substance for the load turbine; it mixes with the products of combustion downstream of this turbine.

One refinement of the powerplant design, although bought at the price of some complication of turbine components, consists in applying the partial-admission principle to

the load turbine also, thereby improving its thermal efficiency.

Turbofan Operation

The reason for calling this powerplant a turbofan is because actual propulsion is accomplished primarily by either a multi-blade transonic propeller or by a device resembling the fans of the ducted fan and bypass engines.

Lagelbauer plans the use of a propulsive rotor with perhaps ¼ to ½ the disk area of a comparable propeller. The rotor, driven by the secondary or load turbine, gives—as part of a rotor-stator combination—a helical flow pattern to the oncoming air. The stator eliminates the rotational component, receiving the major propulsive thrust as a reaction from the propelled mass of air. This is analogous to propeller operation.

Instead of changing blade angles to maintain constant rotational speed, Lagelbauer envisions variable rotational speed while keeping the pitch fixed. To do this, the air division is regulated so that more or less air goes to the turbine system. The air that bypasses the system goes through a heat exchanger at the exhaust or into a mixing chamber, depending on the application.

Performance or Economy

Use of the heat exchanger should improve the fuel economy, Lagelbauer says, although the principal function of the bypassed air is to maintain control of the correct incidence of airflow into the blade sections at any flight condition. (This is analogous to wastegate operation of a turbosupercharger where excess air is dumped overboard.)

If the powerplant were to be applied where performance overruled economy of operation, then the mixing chamber would be the answer. Although the output of the load turbine would be somewhat reduced by operating against the back pressure of the plenum chamber at the exhaust, there would be more energy available to the thermal jet exhaust and this could be expected to compensate greatly for the turbine loss.

Lagelbauer also says that afterburning for a brief period could be useful in getting special performance in climb or takeoff.

These components make up an engine which the inventor believes could offer enormous advantages in economy of operation because of specific improvements in:

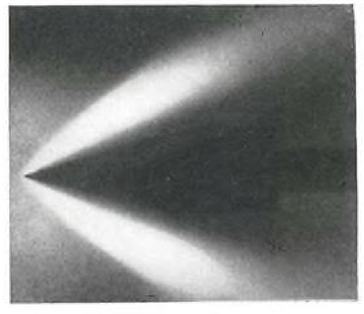
- PROPULSIVE EFFICIENCY, due to increased mass flow through the system.
- COMPONENT EFFICIENCY, because of rotor speed control through bypass air.
- CYCLE EFFICIENCY, because of the high pressure ratio and combustion temperature.

—DAA

New Release Device For Tow Targets

A new method of attaching and releasing tow targets for F9F Cougars has been devised by an aviation ordnanceman at Cecil Field NAS, Jacksonville, Fla. Using a stripped-down, obsolescent bomb rack, the device solves a problem that has been hampering Navy fighter squadrons equipped with the Cougar.

Mounted behind the fuselage through the catapult hold-back hook, the instrument is operated by controls in the cockpit. An electrical lead connected to the suspension hook that releases the target is plugged into the after-section light receptacle.



Seeing Shocks

Nitrogen afterflow technique is demonstrated on simple cone-cylinder model in flow-visualization method utilized by scientists of the NACA's Ames Aeronautical Lab. Windtunnel is filled with electrically charged nitrogen instead of air; nitrogen glows in proportion to the density, reaching peak intensity at shock location. Model is being tested at Mach 3 at simulated altitude of 158,000 ft.

LETTERS

What's Old?

Jack McRae rakes me over the coals (AVIATION WEEK June 21) in a manner that I consider quite unjustified, merely for calling his "new" Super Dart a 1926 airplane. In spite of the fact that all new materials went into this ship, which was completed in 1953, the fact remains, and Mr. McRae admits it, that it is essentially a Driggs Dart, which is still a 1926 design in spite of subsequent modification.

This brings up a question of concern to the many owners of "restored" antique aircraft that are around today—What determines the age of an airplane? Is it the calendar date on the original blueprints, or the age of the raw materials that make up the airframe? Examples are numerous.

The old 1928-30 Travel Air biplanes made such good dusters that many operators rebuild them time and time again to the point where few if any of the original components are left. Are these still 1928 designs, or are they "modern" because they have new powerplants and most of their framework is of recent construction?

What about the two Jennies that have been "built" since the war, one of which was illustrated recently in AVIATION WEEK? These ships have new wood in the wings, steel tube fuselages, and modern powerplants. Are they still Curtiss JN-4s, vintage 1917, or are they now "Curtiss biplanes, 1947 model"?

Mr. McRae's reasoning leaves me in a quandary over what to call my own "new" ship. I am putting the finishing touches on a Detroit gull primary glider that is to be demonstrated at the forthcoming national soaring championships. While this ship carries a 1954 nameplate and date of manufacture, the design received its approved type certificate in June 1930. I have made a few changes in the interest of improved performance, but I still feel that the ship is a 1930 design and not a "new" one. I shall continue to apply the same reasoning to Mr. McRae's Dart.

PETER M. BOWERS
2460 Westlake North
Seattle 9, Wash.

Tuscon Maligned

I know you burst with pride at your clairvoyance and accuracy, but in your reporting of goings-on here in Tucson you've been woefully inept long enough.

The latest transgression appears on page 18 of your June 21 number wherein you state, "the Hughes plant is adjacent to sprawling Davis Monthan Air Force Base. . . . The Hughes plant is adjacent to Tucson Municipal Airport, the only civil airport in these United States sporting a 12,000-foot runway (Davis-Monthan SAC base, 11,500 feet) and with sufficient area to be able to sell Hughes four sections of land (Tucson Airport Authority controls just short of ten thousand acres at this writing) and still have enough acreage left to accommodate all of the aircraft plants in southern California. To this end, Douglas Aircraft took note and moved in June 15. Others will follow!

R. W. F. SCHMIDT, Manager
Tucson Airport Authority
Tucson, Ariz.

Veritherm Accuracy

Thanks for writing up the Veritherm tailpipe temperature tester June 28 (p. 77). Error in accuracy stated, however, shows our accuracy of three degrees C as thirty degrees. . . . Thirty degrees is good enough to be believed, but bad enough to kill interest. . . .

G. F. KELK
North Park
Toronto, Canada

(We are *glad to restore the dropped decimal point. Veritherm's accuracy:* ± 3.0C—ED.)

Praise

I would like to express my sincere thanks for the fine article George Christian wrote about Riddle Airlines, Inc., in the July 5 AVIATION WEEK. I am most grateful for your consideration of our operation. . . . We would like 100 reprints . . . and 25 additional copies of the issue. . . .

W. R. BOYD, *President*
Riddle Airlines, Inc.
Miami, 34, Fla.

WORLD'S FASTEST EXECUTIVE AIRLINER

The new *Learstar* is the only production twin-engine, transport-category airplane that can cruise at over 300 mph TAS at 10,000 feet, the only one that can fly 3200 miles nonstop, the only one that can cruise at 270 mph TAS using only 100 gallons of fuel per hour, and continue at this rate for more than 10 hours. In addition, the *Learstar* offers 2000 feet per minute rate of climb, exceptional single-engine performance, and the ability to operate with ease from pocket-size, grass-runway airports. The *Learstar's* spectacular performance is matched by the scientifically planned *Learstar* cabin interiors, researched and developed during many years of experimentation under actual conditions of executive travel.

These luxurious interiors, accommodating up to ten passengers, make for higher aircraft utilization, because *Learstar* passengers fly more hours without fatigue. *Learstar* executive airplanes are built to CAA-specified airline standards and are designed for flight qualification under the identical CAA "4b" specifications required of such modern airliners as DC-7's and Super Constellations. *Learstars* are the only airplanes designed specifically for executive use that are built to qualify in this category... For complete information, including performance curves, direct inquiry on your company letterhead to Lear, Inc., Aircraft Service Division, Santa Monica Airport, Santa Monica, California.

LEARSTAR

A modification of the famous Lockheed Lodestar

YEARS AHEAD IN PERFORMANCE

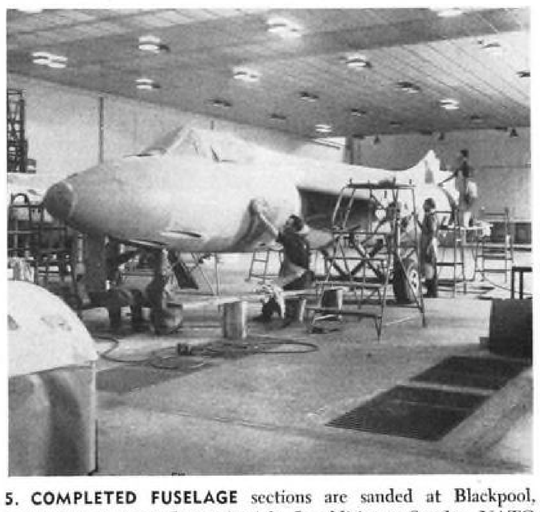
Hawker Speeds Hunters For NATO

1. **SUPERPRIORITY HUNTER,** which is to be one of NATO's mainstays in the air, is being produced in United Kingdom factories, is also being built in Holland and Belgium.

2. **FUSELAGE SECTION,** like other components, is built as complete unit, including all equipment, wiring, etc. When components come together for final assembly, it is relatively easy to connect structures, tubing, wiring.

3. **SEMI-FINISHED** Hunters on production line at Hawker's Blackpool plant wait for other parts to join them.

4. **SWEPT WINGS** are built up on welded steel jigs. Hunters are produced in several Hawker factories. Recent Swedish order will be phased in as RAF order is completed.



5. **COMPLETED FUSELAGE** sections are sanded at Blackpool, preparatory to camouflage paint job. In addition to Sweden, NATO member Denmark recently placed order for Hunters.

PRODUCTION BRIEFING

▶ **Boeing Airplane Co.** plans by next January to begin transferring 700-800 production-line test workers to Larson AFB, Wash., for checking out Boeing B-52 Stratofortress jet bombers prior to delivery to Strategic Air Command. USAF will build a hangar, flight aprons and operations building at the base.

▶ **Carmody Corp.** has been organized in Buffalo, N. Y., to design, develop and manufacture simplified, low-cost training aids such as procedural trainers, animated panels, mockups, cutaway components and animated transparencies. Founder is E. O. Carmody, a pioneer in synthetic trainers, formerly with Stanley Aviation Corp., Buffalo, and prior to that with Link Aviation, Inc., Binghamton, N. Y. The firm plans to work on new-type trainers for classified weapons.

▶ **American Rocket Co.** has been formed in Wyandotte, Mich., to handle consultation, research, development, production and testing of rocket and jet devices. Present operations deal mainly with research on propellants, but rocket guidance and control are also under consideration.

BuAer Contracts

The following contract awards of $25,000 and more have been announced recently by the Bureau of Aeronautics, Department of the Navy, Washington 25, D. C.

BATTELLE MEMORIAL INSTITUTE, Columbus, Ohio, conduct research and study of elevated temperature properties of metals and alloys, $42,600.

P. R. MALLORY AND CO., INC., Indianapolis, interval selectors, Mk. 1 mod., spare parts, 431 ea., $44,412.

O. E. SZEKELY AND ASSOCIATES, INC., Philadelphia, technical services, $26,855.

WEBSTER CHICAGO CORP., Chicago, AN/ARA-25 direction finder systems, components and spare parts, 4,956 ea., $2,439,502.

AIRCRAFT ARMAMENTS, INC., Baltimore, conduct analytical study of external store separation problems monthly progress reports final reports, $26,363.

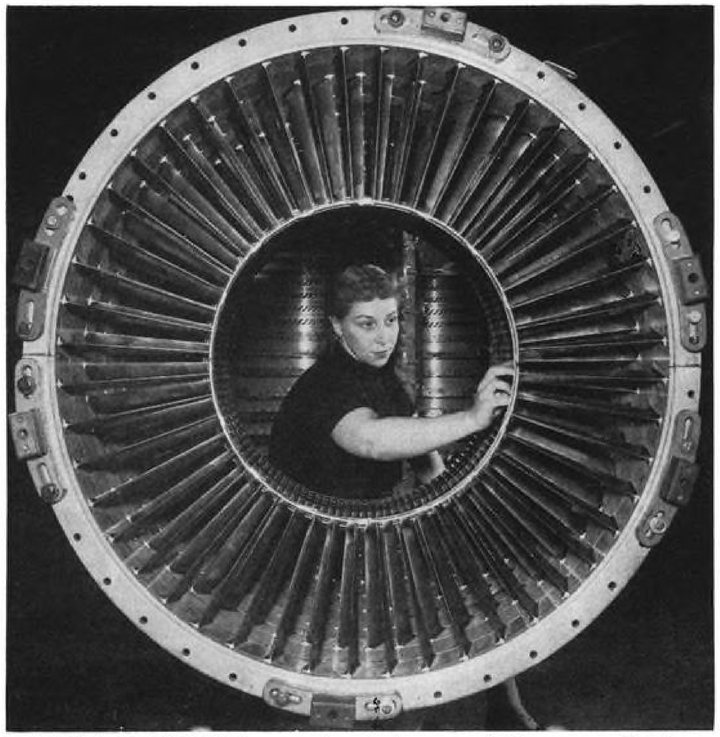
GENERAL ELECTRIC CO., Schenectady, N. Y., services and matls. to conduct two courses for 14 naval personnel in the installation, operation and maintenance of AN-APS-20B equipment manufactured by the contractor, $49,378.

GREER HYDRAULICS, INC., Brooklyn, N. Y., portable hydraulic test stands with gas turbine drive, $34,338.

INSTRUMENT DEVELOPMENT LABORATORIES, INC., Needham Heights, Mass., perform research, development and tests to improve the design and mfg. of buoyant elements of integrating accelerometers, reports, $49,849.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, Mass., conduct a study of nickel-base alloys; bi-monthly progress reports, final reports; $25,000.

McDONNELL AIRCRAFT CORP., St. Louis, test stands for checking and testing J34-WE-34 & -36 turbojet engines, $106,542.



1. **J65 STATOR BLADES** fit in grooved carrier rings on engine's compressor housing.

Views Along Wright's J65 Line

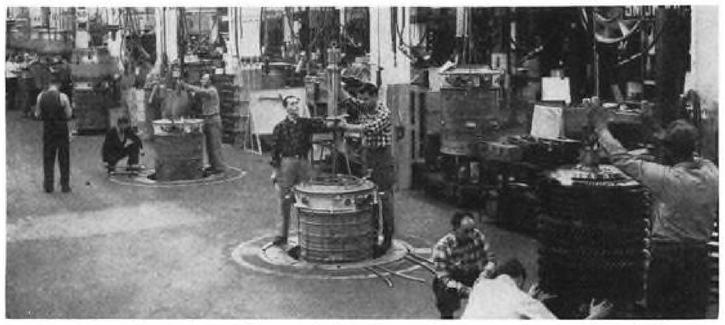
Six high-performance military aircraft types are getting the 7,220-lb.-thrust J65 powerplant, shown in mass production in these photos taken at Curtiss-Wright's Wright Aeronautical Division.

The J65 is specified for USAF's new Lockheed XF-104 lightweight fighter, Martin B-57 night-intruder bomber, Republic F-84F fighter-bomber and RF-84F reconnaissance fighter, and Navy's Douglas A4D bantam bomber and North American FJ-3 carrier-based fighter.

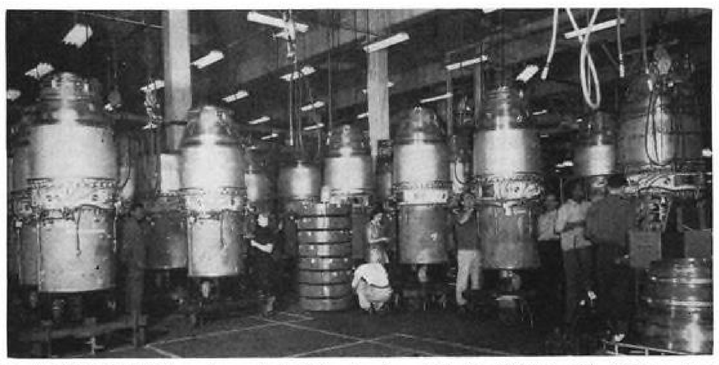
In addition, the J65 has been selected for other military projects of classified nature, Wright says.

The company reports that all of its production J65s have exceeded the engine's guaranteed thrust rating, and that fuel consumption in the field is as much as 6% under the guarantee figure. This lower fuel appetite is translated into longer range, the company notes.

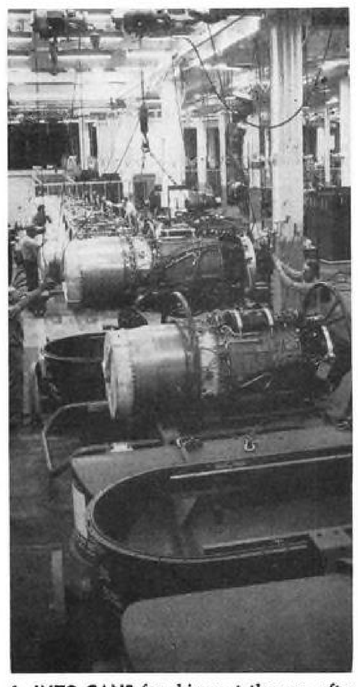
The J65 is also being built by Buick, under license from Curtiss-Wright.



2. **SNUGGLED IN WELLS,** J65s are raised or lowered to convenient working height.



3. **AT END OF LINE,** engines get finishing touches at Curtiss-Wright's Wood-Ridge plant. The J65 powers the Lockheed XF-104 and five other military aircratt.



4. **INTO CANS** for shipment they go, after test to guaranteed 7,220-lb. thrust.

Weapon System Concept Poses Challenge

• New philosophy aims at well-integrated designs, but presents the possibility of too-early 'freezing.'

By Philip Klass

Dayton—The aviation and electronics industries must collaborate more closely to meet one of the greatest challenges to the current "weapon system" philosophy: how to obtain a well-integrated system, yet insure that it incorporates the latest electronic techniques of military importance.

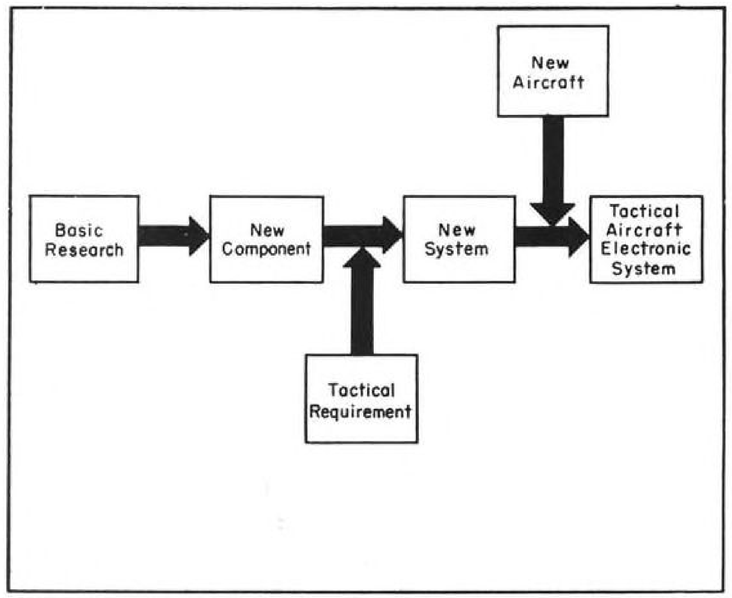
This challenge was expressed by General Electric's H. R. Oldfield, Jr., in a paper read by Bernard Rudwick at the recent Dayton conference on airborne electronics. Oldfield, former manager of GE's advanced electronics center, presently heads its advanced tube development study group. During the war, he was the AF liaison representative on airborne fire control at Massachusetts Institute of Technology's Radiation Lab.

▶ **World War II Philosophies**—During the last war, the genesis of all new avionic equipment centered around basic components research. New and dramatic roles for avionics, sparked by new tactical requirements, grew directly out of the development of such new components as pulse magnetrons, TR and ATR tubes, and basically new antenna techniques, Oldfield said.

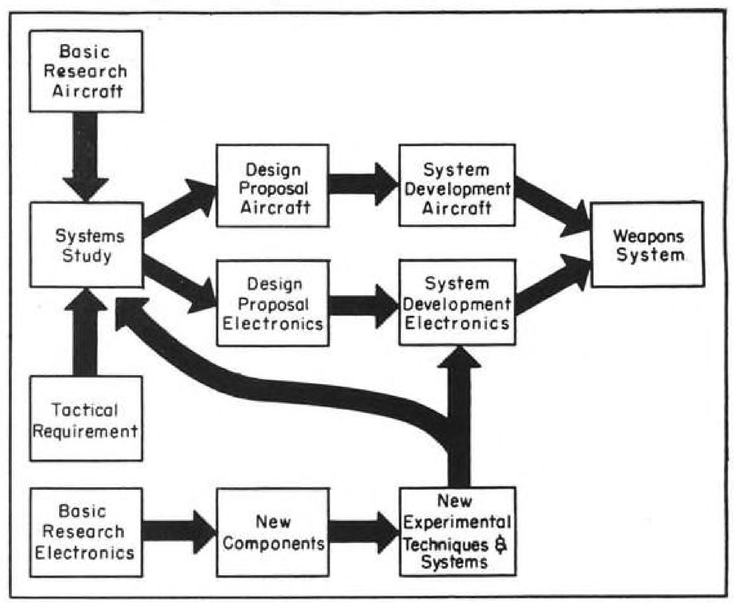
Frequently, a new avionic system was evolved, tested in a non-tactical aircraft, and immediately ordered into production. "Then came the messy and cumbersome business of mating the two (equipment and tactical airplane) into a usable weapon," Oldfield said.

"Where the priority was just average, this mating was often unsuccessful. Where the priority was sufficiently high, and by using physics Ph.Ds. as bombardiers and maintenance men, it was possible to perform near miracles in introducing new techniques into the field within months, or even days, after the tactical need arose," Oldfield noted.

▶ **Technique Over System**—Despite the many resulting headaches, Oldfield pointed to several examples in which the application of the new techniques paid off, despite lack of what would today be called weapons system planning: battle of the buzz bombs, breaking of German submarine campaign, defense of Anzio beachhead, radar bombing of Japan, invasion of Normandy.



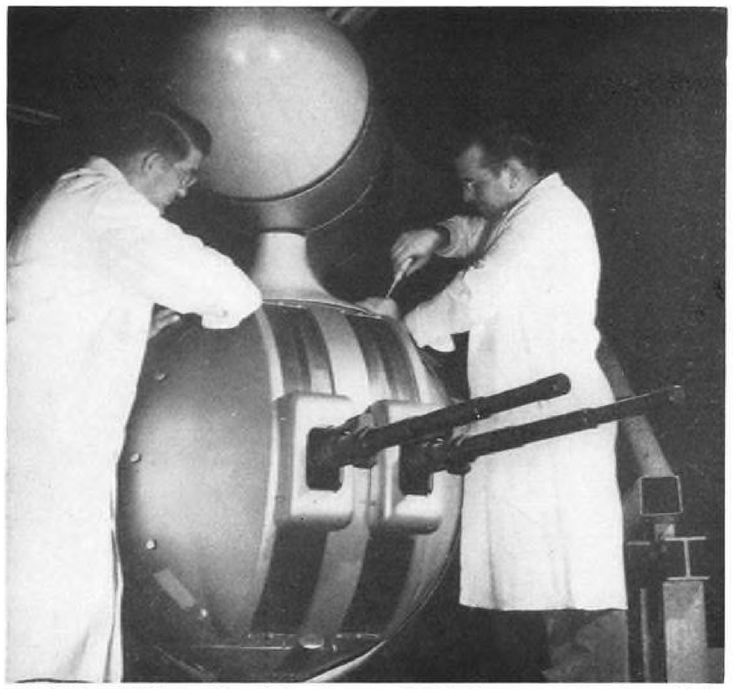
WORLD WAR II system of mating new avionic devices and aircraft often failed.



WEAPON SYSTEM concept eliminates "patchwork," but requires close cooperation.

For example, the introduction of airborne microwave (3 cm.) radar enabled the Allied air forces to track down German U-boats. The German navy was completely confounded as to our means of submarine detection and thus was unable to take useful countermeasures until it was too late, Oldfield pointed out.

▶ **Different Ground Rules**—"We can no longer patch together a weapon from a conglomeration of radars, computers,



GE TECHNICIANS checking their radar-controlled B-47 turret typify close avionics-airframe manufacturer liaison required for complex weapons systems.

guns and an aircraft," Oldfield acknowledged. Reasons for this are the increased complexity of aerial warfare and the high speeds involved.

"We must create a weapons system tailored to the specific tactical application which the military requires." This has sharply altered the ground rules under which the avionics industry and its designers operate.

Today, the conception of a new system during the systems study phase is "almost necessarily based around existing electronic equipment or that which can be promised in the reasonably near future," rather than on the development of new electronic components, Oldfield said.

Running in parallel with the weapons system development program is the normal sequence of electronic research and development, proceeding from basic research to new experimental devices aimed at making real advances in the state of the art.

► **Early Freeze**—"In the weapons system concept there appears to be a rather early freezing of basic equipment philosophy," Oldfield noted. This means the avionic system will not be as sophisticated as it might be if the fruits of new avionic developments could be incorporated later in the aircraft development cycle.

Oldfield believes the solution to the problem involves both the avionics and the aircraft manufacturer:

• **Avionics industry** must accept and understand the requirement for integrating its equipment as just another part of the weapons system. Oldfield believes the industry has faced up to this fact and is organizing to fit into this pattern. GE for example has organized its new electronics lab to concentrate on systems research and development.

• **Aircraft industry** must bear in mind, during its complex, long-term system-integration programs, that some major or minor technological breakthrough in the avionic industry, possibly a revolutionary new component, may completely obsolete the carefully integrated avionic portion of the weapons system.

"The long-range solution to this problem can come only through a considerably closer coupling between the two industries in the research and development phases," Oldfield said.

Both must realize "that either party may logically be the dominant member of the team, depending upon the nature of the problem."

Science of Avionics

Avionics (aviation electronics) has become a "distinct science or branch of engineering" because of the new and difficult technical problems which it presents, H. R. Oldfield, Jr., General Electric Electronics Division told the recent Dayton conference on airborne electronics.

"The environmental facets inherent in aircraft created a completely changed condition of operations," Oldfield said, because of such things as vibration, pressure, precipitation static, extreme temperatures, and stringent space and weight limitations.

New Fast-Acting Gyro Made for Missiles

A new two-axis-of-freedom gyro, which reportedly can accelerate to operational control speeds within 10 seconds, an important advantage in guided missile applications, has been announced by Summers Gyroscope Co. The new hermetically sealed Model 221 is currently used in a supersonic ground-to-air missile and will be used in an air-to-air missile, according to the manufacturer.

The new Summers gyro can be powered by 28 v. d.c. or 115 v. 400 cps., single- or three-phase current. Unit has a maximum reported drift rate of 0.1 deg./min. and can be furnished with either pot or synchro pick-offs. Gyro can be electrically caged from normal displacements within four seconds, or a maximum of 20 seconds if displaced full 180 degrees. Resonant frequency is 240-260 cps.

Model 221 weighs 4¾ lb., measures approximately 3½ in. dia. x 5 in. long. Company address is 2328 Broadway, Santa Monica, Calif.

Avionic Literature

New technical bulletins and booklets describing devices and techniques of interest to persons in the avionics field include:

• **Airline airborne radar,** two booklets describing operational and technical features of new RCA AVQ-10 and Bendix Radio RDR-1 equipments. Available from RCA's Commercial Aviation Sales Dept., Camden, N. J. and from Bendix Radio Division of Bendix Aviation Corp., Baltimore 4, Md.

• **Magnetostriction,** Bulletin A-169, discusses ferromagnetic materials and gives data on their magnetostrictive properties. Numerous devices employing this principle are described. (28 pp.). International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.

• **Selenium rectifiers,** Bulletin 6.400, contains application data for design engineers. (24 pp.). Fansteel Metallurgical Corp., North Chicago, Ill.

• **Potentiometers,** standard and power types, both linear and non-linear. (8 pp.). Electronic Sales Div., DeJur-Amsco Corp., 45-01 Northern Blvd., Long Island City 1, N. Y.

• **Telemetering subcarrier oscillators,** for FM/FM system, are available in two new packages. Model TATP-3 operates in any four of the RDB bands below 22 kc., Model TATP-4 operates above 22 kc. Data sheets can be obtained from Pacific Division, Bendix Aviation Corp., 11600 Sherman Way, North Hollywood, Calif.

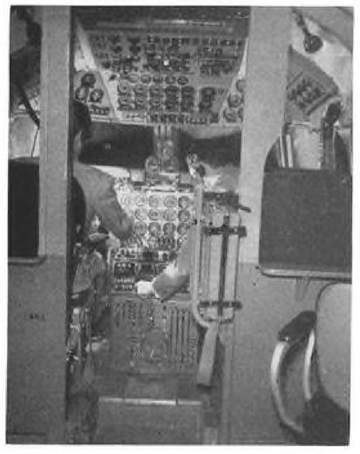
• **"Effects of Tube Shields** on Miniature Electron Tubes," and "An Evaluation of Shields for Subminiature Electron Tubes," are two booklets available from International Electronic Research Corp., 175 West Magnolia Blvd., Burbank, Calif.

FILTER CENTER

► **Collins Mag Amp Gyro**—Prototype models of Collins Radio's new MC-101 gyro-compass, which substitutes magnetic amplifiers for all but one of the normally used electron tubes, will be available for test within a couple months. New gyro-compass, designed to provide heading signals for the Collins Integrated Flight System, should be available in production quantities within a year, company spokesman says.

► **Bigger Wescon Expected**—More than 500 exhibit booths have reportedly been reserved for the 1954 Western Electronic Show and Convention, Aug. 25-27, in Los Angeles, compared to 370 for last year's Wescon. More than 100 technical papers are scheduled to be given during 28 technical sessions.

► **Setting the Record Straight**—AVIATION WEEK's May 17 article on 3-D radar displays, based on a paper by a Sperry Gyro engineer, has prompted R. L. Burtner to call our attention to similar work reported in the March 1948 issue of the RCA Review. This and other historical references cited by Sperry's Walter R. Tower in his original paper, were omitted from AVIATION WEEK's article in the interest of brevity. Despite RCA's early work, Sperry sticks to its claim of being the first to patent 3-D radar displays, with its patent application filed back in 1942.



Ground-Based DC-6B

What appears to be a DC-6B cockpit is actually a Curtiss-Wright Dehmel DC-6B flight simulator, recently ordered by Swissair for crew training at its base in Kloten, New Zurich. Simulator costs $800,000, but is expected to pay its way by reducing training expenses.

New Fuel Unit Boosts Jet Performance

• Parker's variable-area fuel nozzle helps improve combustion efficiency and give faster starts.

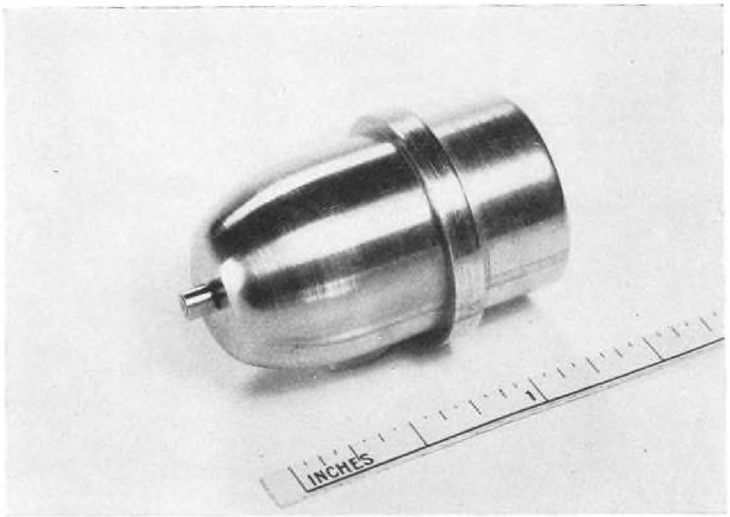
By George L. Christian

Cleveland—A new jet engine fuel nozzle, in prototype production here at Parker Appliance Co., may increase the range of jet aircraft and reduce the time needed for "scrambles," company engineers say.

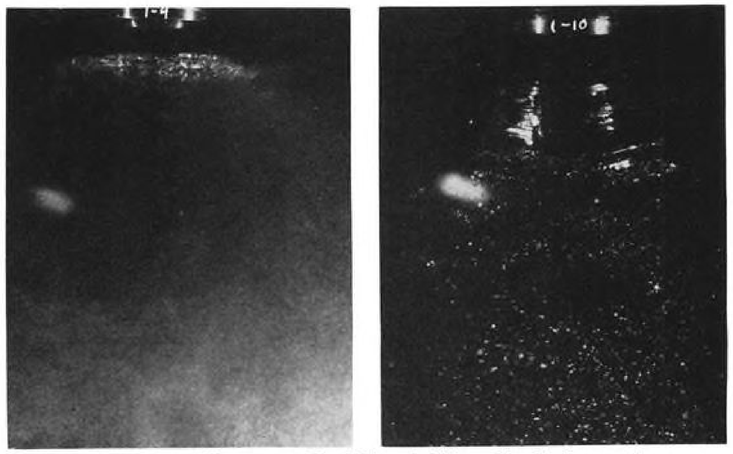
This is made possible by the use of the variable-area principle—first time this has been applied successfully in a jet fuel nozzle, Parker says—and a special valve, which boosts combustion efficiency.

The new nozzle shows great promise for turbojet engines used in supersonic and very-high-altitude aircraft; and because all of its functional parts are contained within an envelope of one-half inch, it should be useful in space-limited ramjet applications.

It is especially adaptable for use with the new-type aircraft fuels, according to company engineers.



VARIABLE-AREA NOZZLE shown here has 18:1 maximum-minimum flow ratio.



SPRAY PATTERN, variable-area nozzle (left) and high-quality duplex nozzle.

► **In New Jet**—Parker says the nozzle is being tested and considered by most of the major jet engine manufacturers, and is giving excellent test performance in late-type, high-power engine. It is the result of an intensive, three-year research and development program carried on by the Engine Accessory Division of Parker.

J. F. Campbell, who is acting in the capacity of consulting engineer for the nozzle program, holds basic patents for the device.

► **Better Atomization**—The specially designed valve spins fuel at a considerably higher rate for a much lower fuel flow through its orifice. Result is much better fuel atomization. This gives a considerable increase in combustion efficiency—an important consideration in helping the turbine engine designer bring the jet's specific fuel consumption closer to that of a piston engine.

The mechanical valving system, which is built integrally within the nozzle, provides positive closing at the "end of the line," i.e. at the nozzles which are the farthest point in the fuel system from the tank. Thus the entire fuel manifold from tank to nozzles is kept full at all times, and the plane's engines may be started in the shortest possible time—an important consideration in the event of a "scramble."

(In conventional systems, the nozzles are "open" and fuel manifolds are only partially full. Precious seconds are wasted filling them before sufficient fuel reaches the nozzle to support combustion).

Another important result is that the integral valving action allows fuel flows to vary quickly and easily from minimum to maximum with but a single line, eliminating the dual line and cumbersome, weighty plumbing, previously required to handle the large fuel flow variations.

Furthermore, the positive valving action seals the fuel within the nozzle and prevents it from leaking into the combustion chambers, eliminating occasional "hot spot" starts caused by ignition of puddles of fuel in the chambers.

► **Test Results**—Parker cites these improvements which were noted during sea level tests conducted with a production engine incorporating the new nozzle:

"More positive fire-ups . . . with considerably lower minimum fuel flow. . . . Time from 'throttle cracked' to 'fired' average 14% less. . . . Engine always fired the instant the fuel manifold pres-

sure reached the nozzle opening pressure. . . Fuel flow at the time of 'fire' averaged 53% less. . . . Routine starting procedure did not need to be too carefully followed to assure positive fire-ups."

These improvements are primarily achieved by the nozzle maintaining a full fuel manifold at all times and furnishing good atomization at very low fuel flow, Parker states.

Burst accelerations between operational idle and takeoff power averaged 3% less time and 50F lower burner temperature, when the new nozzle was used. It was evident that a considerable gain could have been made by modification of the governor acceleration programming, Parker points out.

▶**Higher and Lower**—These benefits were cited as flowing from the better fuel atomization created by the Parker nozzle compared with that in a standard-type nozzle:

• **Lower starting engine rpm.** An engine's starting rpm. is considerably less than that required with a conventional nozzle. The engine does not power itself from the instant combustion is initiated at about 200 rpm.), but it does produce power enough to unload the starter until the engine becomes self-supporting at one-third ground idle rpm. One result is less wear and tear on the starter, prolonging its life. Drain on the plane's battery is reduced, improving battery performance.

• **Better high-altitude starting characteristics.** Engines equipped with the Parker nozzle start more quickly at altitude because the variable area nozzle will fire up engines at much lower fuel flows and slower starting rpm. than is normally required.

▶**Wide Flow Range**—The new nozzle can handle wide ranges of fuel flow without corresponding largae variations in fuel pressures, say Parker engineers. This is particularly noteworthy in the high-fuel-flow ranges, where the nozzle will pass as much as 3,400 lb./hr. at 400 psi.

Here are sample flows, with corresponding pressures:

• **15-50 lb./hr.** at 60 psi.; minimum flow for starting.

• **160 lb./hr.** at 85 psi.; for cruise conditions.

• **1,500 lb./hr.** at 250 psi.; for climb and high-power operation.

• **3,400 lb./hr.** at 400 psi.; for takeoff.

Thus the highest pressure needed is 400 psi., and this only at takeoff. During the rest of the flight, pressures of 250 psi. and lower are all that are required. This should be a relief to manufacturers who are faced with the problem of making pumps that deliver not only increasing quantities of fuel, but at higher and higher pressures.

These relatively low pressures at high fuel flows are achieved by automatically modulated increases in the nozzle's metering passage areas to maintain a relatively constant energy level.

A smaller nozzle is in development, with a flow range of 9-450 lb./hr., with a pressure range of 60-200 psi.

▶**Immediate Atomization**—Advantage of the nozzle's positive valve action is the fact that it does not open until sufficient pressure (60-65 psi. with JP-4 fuel) has been built up in the fuel manifold to assure good and immediate atomization. This action assures quick starts.

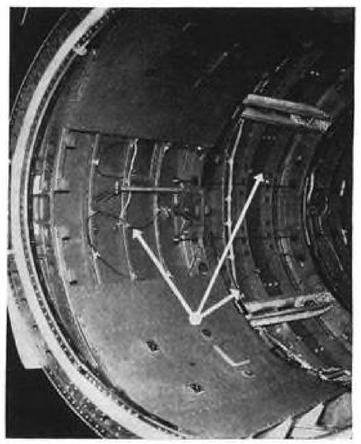
The variable-area nozzle is so designed that a sufficiently high value of swirl energy and exit valve velocity is maintained always to assure satisfactory atomization, Parker says.

The valve's positive closure eliminates need for combustion chamber drain manifolds and associated valves.

▶**Wide Viscosity Range**—The nozzle is also capable of handling fuel under wide viscosity ranges. Parker says that a viscosity variation of from 0.5 to 20 centistokes will have a negligible affect on the fuel's atomization. Put another way: At a constant pressure drop, the fuel flow will change approximately 12% for this viscosity change.

Pressure potentials and spin velocities are established at a value which gives excellent atomization for fuels of 20 centistokes viscosity unless some other value is specified. (Twenty centistokes was selected because it is the approximate viscosity of JP-4 at a temperature of −65F.)

Parker officials say that nozzle operates equally well on fuels ranging in viscosity from aviation gasoline through jet engine lubricating oil.



F-102 Fire Detector

This first picture of the interior structure of Convair's supersonic delta-wing F-102, shows the Thomas A. Edison continuous type, re-setting fire detector installed (arrows) on a section of fuselage. Two sections of engine shroud are riveted in place above and below a portion of the detector.

▶**Uniformity and Variety**—Parker cites these examples of the nozzle's uniformity of performance and variety of potential application:

• **Uniformity.** The nozzle is designed to assist in obtaining highly uniform fuel-air ratios (and therefore highly uniform combustion chamber temperatures) from one burner to the next. The temperature spread between maximum and minimum burner outlet temperature pattern was reduced from 12% to 4% by using the variable-area nozzle in tests on one production-type jet engine.

The unit is also designed and engineered to achieve a ±2% matching of fuel flows for a given pressure.

Parker adds that exhaust gas temperatures are 5-8% lower for a given rpm. and corrected specific fuel consumption. This indicates that a lower specific fuel consumption can be obtained by proper adjustment of the variables involved.

• **Variety.** Parker engineers say the nozzle is built so that the fuel winds tightly around the exit valve stem and related downstream contour. This makes it possible to obtain a wide variety of spray sheaf shapes and angles. Also, the spray sheaf angle can be varied to meet almost any desired program of sheaf angles versus fuel flow. By using the nozzle calibrated for fine atomization and short penetration, length of the combustion chamber can be cut considerably, resulting in a corresponding reduction in engine length and attendant weight and space savings, the company says.

Parker officials stress that to obtain the ultimate efficiency out of the variable area nozzle the combustion chamber must be altered to take advantage of the wide range of atomization, sheaf angle, sheaf shape, spray penetration, etc., available with this nozzle.

▶**Parker Findings**—Rogers pinpoints some findings of Parker engineers with the new nozzle:

• **Lower specific fuel consumption** has been proved in operational experience with the unit. In one case a 2-3% reduction was obtained with the variable area nozzle using JP-4 fuel over a standard nozzle using aviation gasoline. With the standard nozzle, the specific fuel consumption was 14% higher with JP-4 than with aviation gas.

In another case using JP-4 fuel, the specific fuel consumption under 40,000-ft. conditions was 5-7% less with the variable area nozzle. This may have an important impact on increasing jet range.

• **Exhaust smoke,** using JP-4 fuel is considerably reduced at takeoff power.

• **Wider margin** between safe operation and flame-out is offered by the nozzle.

• **Nozzle, including body,** is a complete functional unit and does not depend upon installation in a holder. This allows the nozzle to be installed in equipment at the engine manufacturer's assembly line for such designs where "built-in" type fuel systems are used.

• **Outside shape and size** of the nozzle body can be furnished according to jet engine manufacturer design requirements.

• **Air deflectors** can be of improved design since they no longer need be an integral part of the nozzle or nozzle holder structure.

▶**Reliability**—Parker engineers say the reliability of their variable-area fuel nozzle "is directly related to its ability to maintain its original calibration when subjected to the numerous conditions imposed by the customer. These conditions have been taken as those outlined in specification MIL-E-5009."

One of the construction features of the nozzle which permits the unit to operate with tight tolerances is a special spring which works with the valve. The spring is machined from chrome-vanadium steel with considerable precision and its rate (or scale) is maintained within ±1%. The spring cannot cant with the result that "it will eliminate any hysteresis from unbalanced forces imposed on the moving parts," Parker says.

▶**About the Company**—Parker recently transferred all engineering and sales personnel for airframe products from Cleveland to a new plant at Los Angeles International Airport. Most manufacturing has moved there too; eventually, all airframe products manufacturing will move to the West Coast.

Aircraft engine accessory engineering, manufacturing and division sales will remain in Cleveland.

Parker started doing business in October 1924, as a sole proprietorship. The company was incorporated as Parker Appliance Co. in 1938.

Total sales volume is divided 60% for aircraft products, 40% for industrial components. The company now works with all major jet engine manufacturers in the country, with its primary interests in the fields of fuel, hot air and hydraulic applications.

Parker has 485,000 sq. ft. of manufacturing and office space here in Cleveland. Other plants are in Los Angeles, Berea, Ky., and Eaton, Ohio.

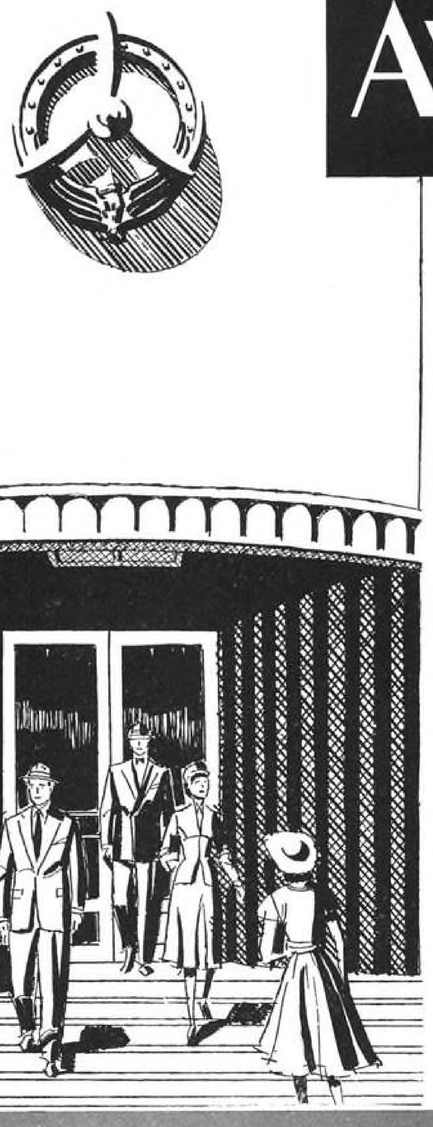
Giant Stand

New USAF hydraulic-electric-operated maintenance workstand undergoes test at Boeing Airplane Co., Seattle, next to the towering tail of an eight-jet Boeing B-52 Stratofortress. The new stand can be extended 43 ft., just five feet short of the tip of the B-52's tail.

OFF THE LINE

Amnor Aviation Corp., Mamaroneck, N. Y., has been appointed East Coast distributor and warehousing facility for Aeroquip Corp., flexible aviation hose and reusable fitting manufacturer.

Dave Ellies, formerly associated with Butler-Zimmermann, New York industrial design consultants, has opened his own offices at 395 E. Broad St., Columbus, O. Ellies did interior design work for Northwest Airlines and Trans-Canada while at BZ.



AVIATION WEEK *presents the*

AUGUST 16, 1954

THE *complete story of AIR FORCE PROCUREMENT* AIR MATERIEL COMMAND EDITION

WORKING WITH the editorial cooperation of the USAF Air Materiel Command, Aviation Week's editors are preparing their most important publishing assignment of the year . . . the August 16 Air Materiel Command Edition. Editorial offices at Wright-Patterson Air Force Base, Dayton, Ohio are humming with activity as teams of Aviation Week editors collect the latest available information and data on 1955 Air Force Procurement and weave together the complete story of this major Air Force Command.

KEY EDITORIAL EFFORT is being concentrated on covering new policies and ground rules of AMC and its revised relations with the aircraft industry . . . spelling out new regulations and complete information on how to best do business with the government. Other editorial sections will be devoted to Air Force industrial mobilization plans, spares provisioning policy, and industry's new role in Maintenance and overhaul programs. Research and Development procurement will be featured in a special report.

COMPLETE DETAILS on Fiscal 1955's Air Force Procurement Program as well as complete Command organization data and buying information will establish the unmatched usefulness of this Air Materiel Command edition in the Aviation Industry, the Air Force and the Government. In addition, this issue will provide a valuable tool in the government's everlasting search for new sources of manufactured products, materials and services.

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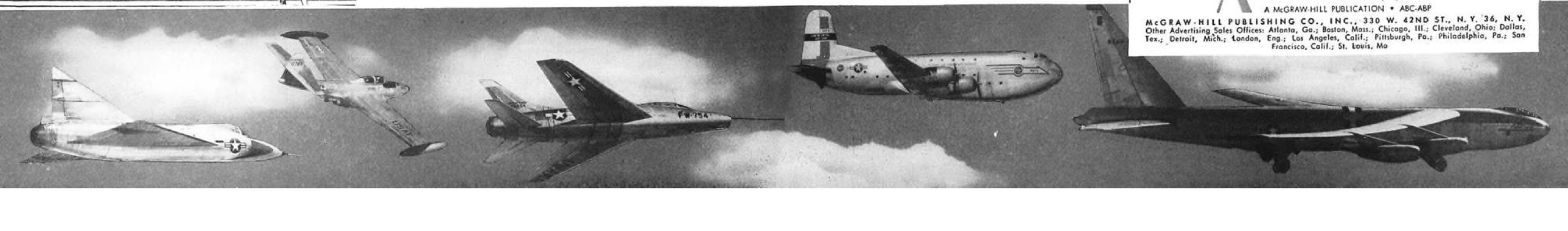


OVERSEAS SPOTLIGHT

No Copters Yet for KLM

AMSTERDAM

KLM Royal Dutch Airlines will not proceed to the use of passenger helicopters "until the twin-engine Sikorsky is on the market," probably by 1957, a company official has told AVIATION WEEK.

The company views present Western European passenger copter services as a "successful publicity stunt," and feels single-engine copters are "too risky, too irregular, and highly unprofitable." The KLM official stated that even a twin-engine service would operate at a loss, considering the present state of helicopter development.

Fiat F-86K Pact Signed

ROME

Contract for assembling 50 F-86K Sabres by Fiat in Italy has been signed at Wiesbaden. This gives effect to the general agreement signed in Washington in May 1953. Fiat may open a plant in Turin to help handle the work.

The contract amounts to $22.5 million, but the total outlay, inclusive of supplies in the U. S., will come to $54.5 million. Italian industry will get about $8 million of the $22.5 million, with the remainder scheduled to be spent on the other side of the Atlantic for accessories, motors, radar, and other equipment.

Meanwhile, AVIATION WEEK has learned, a U. S. commission visiting Italy is said to have warned that if the Italian government does not have aircraft built on its own account, no more off-shore orders will be placed here. This type of aid is to supplement, not replace, the local effort, the commission is reported to have said.

RAF Releases 50 C-47s

LONDON

The 50 C-47 Dakotas recently released by RAF (AVIATION WEEK July 19, p. 7) are scheduled for service with NATO air forces. They will be reconditioned in Great Britain at U.S. expense, then returned to the U.S. government for reallocation to the Western allies, says Flight magazine.

Car-Ferry Airline Busy

MONTREAL

Silver City Airways, British cross-channel operator, carried 39,041 vehicles and 96,625 passengers in 1953, International Civil Aviation Organization reports. With its 7.6-million capacity ton-miles, Silver City ranked among the world's first 40 airlines, says ICAO. The carrier operates four routes across the channel and one to the Isle of Wight, with an average stage length of 84 miles.

The first of three new Bristol Mark 32 freighters was delivered to the airline recently, joining six others already in ferry service. The Mark 32 holds three cars and 20 passengers.

Two additional companies recently entered the busy car-ferry field. Aer Lingus, the Irish airline, opened a Dublin-Birmingham service; and a Franco-Spanish company has been formed for Mediterranean service.

El Al Tries for U. S. Loan

TEL AVIV

El Al Israel Airlines is reported seeking a large loan for the purchase of new, modern aircraft. Negotiations between El Al and a leading U. S. bank are understood to be nearing a successful conclusion.

U. S. Equipment Order

LONDON

Two British firms have secured a $1.5-million order from the U. S. for mobile ground power units for starting jet aircraft. The starters are for the use of the Western Allies.

Sharing the order are Auto Diesels, Ltd., and Crompton Parkinson, Ltd.

WHAT'S NEW

Telling the Market

An eight-page bulletin—No. 3020—on **plug valve actuators** has been released by Ledeen Mfg. Co., 1600 So. San Pedro St., Los Angeles 15. . . . **"Forming and Bending Kaiser Aluminum,"** a 272-page book prepared by Kaiser's Technical Writing Department may be obtained free of charge when requested on company letterhead, or for $2.00 for personal libraries. Address Technical Editor, Kaiser Aluminum & Chemical Sales Inc., 919 N. Michigan, Chicago 11. . . . Forty-page Bulletin 69D, published by Niagara Machine & Tool Works, contains latest information on the entire line of **power squaring shears.** Company's 32-page Bulletin 89C introduces the complete, new line of **press brakes.** For either or both write Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N. Y. . . . The Sciaky **unit welding transformer** is the subject of Bulletin 328-10 issued by Sciaky Bros., Inc., 4915 W. 67th St., Chicago 38.

T. W. and C. B. Sheridan Co. has prepared an eight-page folder on its **combination bulldozer and extrusion stretch-wrap forming machine.** Requests on company letterhead should be sent to Sheridan at Palos Verdes Estates, Calif. . . . New **safe-torque drivers** are covered in Bulletin 20-50 of Scully-Jones and Co., 1901 S. Rockwell St., Chicago. . . . Bulletin HY-554 is being distributed by Armstrong-Bray & Co. to announce the Hydragrip, a new portable, single-ram hydraulic power unit for **pulling or pushing gears, wheels, bearings or parts.** Company is located at 5366 Northwest Highway, Chicago 30.

Publications Received

- **A History of Flying**—by C. H. Gibbs-Smith—pub. by Frederick A. Praeger, Inc., 105 W. 90th St., New York 18, N. Y.; $4.95; 304 pp. A history of man's fight for mastery of the air, starting from legendary times.
- **Selected Combustion Problems, Fundamentals and Aeronautical Applications**—The Advisory Group for Aeronautical Research and Development of NATO—pub. by Butterworths Publications Ltd., 88 Kingsway, London, W.C. 2; 534 pp. Report of Combustion Colloquium held at Cambridge University, England, Dec. 7-11, 1953.
- **Optical Image Evaluation**—U. S. Dept. of Commerce, National Bureau of Standards, Circular 526—Order from Government Printing Office, Washington 25, D. C.; $2.25 buckram bound; 212 figures, 289 pp. Proceedings of the NBS Semicentennial Symposium on Optical Image Evaluation held Oct. 18-20, 1951.

The Rise in Aircraft Shares

COMPANY	DEC. 31, 1953 CLOSE	JULY 16, 1954 CLOSE	INCREASE POINTS	INCREASE PERCENT
Beech	$9.75	$19.125	9.375	96.1
Bell	23.625	37.250	13.625	57.6
Boeing	24.00[1]	49.875	25.875	107.9
Cessna	7.00	10.75	3.75	53.6
Curtiss-Wright	7.75	11.875	4.125	53.3
Douglas	41.312[1]	86.50	45.187	113.1
Fairchild	10.00	13.375	3.375	33.8
Grumman	23.375	29.125	5.65	23.9
Lockheed	27.50	36.25	8.75	31.7
Martin	16.875	26.00	7.125	42.4
McDonnell	19.750	27.875	8.125	41.1
Northrop	18.00	34.125	16.125	89.6
North American	21.125	40.125	19.00	90.2
Republic	23.00	36.375	13.375	58.2
Ryan	15.00	25.25	10.25	68.2
United Aircraft	46.625	75.04[2]	28.41	61.0

Notes: [1] Adjusted for stock splits.
[2] Reflects Chance Vought spin-off.

(Aviation Week survey.)

Aircraft Stock Prices Spurt Ahead

Industry's stable outlook is reflected in continued rise of shares; some have doubled since 1953 year-end.

Rising price quotations and sustained strength in aircraft equities have been an outstanding market phenomenon thus far this year—some aircraft stocks have more than doubled in price since the start of the year. Hefty increases, in varying degree, are prominent for the entire list.

This accomplishment is disclosed in the Aviation Week compilation (above) of the market action of all major aircraft companies' common stocks in the first seven and one-half months of this year.

► **Up and Up**—The burst of strength in aircraft equity prices has outdistanced anything of a similar nature seen for the group for a long time. Current gains are on top of the steadily rising market quotations for the aircraft group in progress for a few years now, but the price boosts negotiated by a number of aircraft stocks thus far in 1954 have been more spectacular than the appreciation accomplished during past periods of two or more years.

The motivation that leads investors and speculators to buy or sell specific types of securities at a specific time has never been susceptible to a precise analysis. The sustained high-volume production outlook for the aircraft industry has been a fact well established in responsible investment circles for some time.

Good business has brought about consistent earnings and liberal dividends for many aircraft companies in recent years. This condition has been cited repeatedly in this space. The short-term risky feature of the industry, common to all enterprises dependent upon military appropriations, no longer appears to cause the investor apprehension of the past. The realization has taken hold that unsettled international tensions promise a relatively high rate of aircraft production for the foreseeable future.

As pointed out here as long ago as Mar. 3, 1952 (p. 12), U. S. defense planners appear to have recognized the inefficiency of the "accordion" pattern of aircraft production. A steady course toward the nation's long-range airpower goals has tended to smooth out the industry's "peaks" and "valleys," and improve its appeal to investors.

► **Tax Burden Easier**—There can be no doubt that the sharply increasing 1954 interim earnings for a number of aircraft units, due to the lapse of excess profits taxation, has served as heady fuel to the boiling markets.

It is also probable that, as the industry has attained greater investment stature and the past "war-baby" fears have worn off, aircraft earnings have begun to command higher market valuations.

For example, a few years ago, it was considered good judgment in some cir-

cles to value aircraft earnings at four or five times their current rate. This meant that a company that was expected to show annual earnings of about $3.00 per share would find its common stock selling at around $15 per share.

Today, as tendencies incline to value aircraft earnings at seven or eight times, and even higher, the impact on market quotations becomes self-evident. Price-earnings ratios are rarely constant; they are influenced by general market pressures, investment climates and evaluation of individual industry groups competing with one another.

The fact remains that most aircraft equities have given their owners a happy time thus far in 1954, although no uniformity in price appreciation is present. The table on page 59 shows a range at July 16, of from 113.1% to 23.9% of prices at the close of 1953.

▶ **Star Performers**—Douglas is clearly the outstanding performer, having more than doubled in price since early this year ($86.50 vs. $41.31). The company's shares were split two-for-one this past May and the quotations of the new stock are at about the level of the old stock prior to the split.

Boeing, which also effected a stock split earlier this year, lost little time in more than doubling in price ($49.88 vs. $24.00).

Beech, as it resolved its past problems and improved its outlook, found eager supporters to bid its common stock to a new peak and almost double the price recorded at the 1953 year-end ($19.13 vs. $9.75).

▶ **Speculative Support**—The speculative elements boosting aircraft stock purchases can be seen in the market behavior greeting the announcement that North American Aviation received a contract to develop and build an atomic reactor for commercial use.

The company is solidly entrenched as the builder of the backbone of the Air Force's fighter program. Moreover, its interest in atomic energy research development has been known for a few years, receiving prominent mention in its annual reports. Yet, this recent announcement of its atomic energy activity was greeted as something new by many stock buyers who rushed into the market pushing the price of North American's stock sharply.

In other words, this buying impetus stems from a factor which was present for some time and which is unlikely to contribute much, if anything, to earnings this year.

The selectivity of price gains among the aircraft group once again reveals the selectivity which has become so pronounced in the industry. These wide disparities will continue to prevail in the future.

—Selig Altschul

AS A COMMERCIAL TRANSPORT, the new four-jet Boeing 707 can seat up to 130 passengers and cruise at 550 mph. at high altitudes.

Exclusive Report on Boeing's Jet Transport

707 Designed for Low-Cost Operation

By David A. Anderton

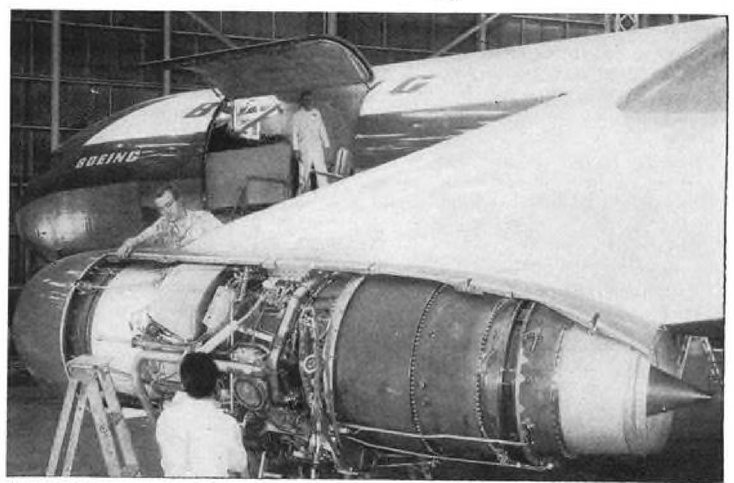
Seattle—The most unusual thing about Boeing Airplane Co.'s 707 jet transport prototype is that it is not unusual.

It is a conventional airplane by today's sweptwing, jet-propelled standards. It was designed that way deliberately by Boeing engineers, because they wanted to build an airplane that would have maximum utilization and require minimum maintenance, whether in service for the commercial airlines as a transport or for the military as a tanker.

With this engineering philosophy built into an airframe around the four big Pratt & Whitney Aircraft JT3 turbojets—commercial counterparts of the 10,000-lb.-thrust J57—Boeing hopes to prove that economical jet transportation has come to stay.

► **Conventional?**—The airplane layout shows nothing unusual in the way of aerodynamic geometry. The 35-deg.-swept wing and tail, the cylindrical fuselage and podded powerplant all are acceptable current practice.

Structural design follows the same pattern. There are no thick wing skins as on the B-47 Stratojet. Instead, there is more similarity between the structure of the 707 and that of the Stratocruiser; skin gages are comparable and there are many similar design details.

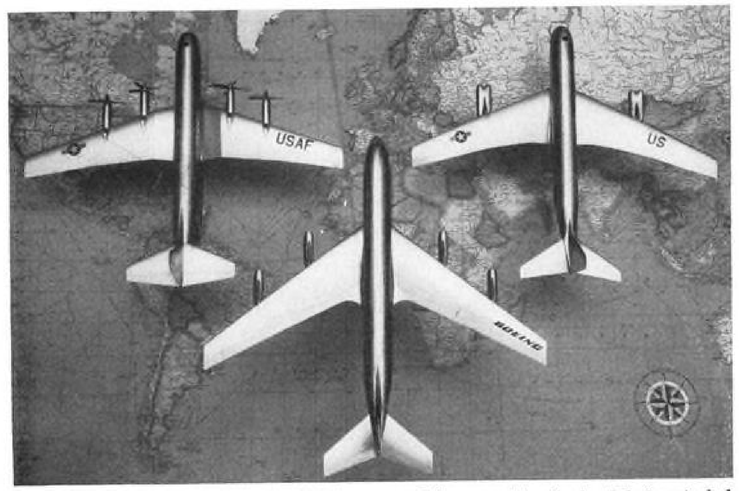


ENGINE MAINTENANCE is simplified by readily accessible, low-slung P&WA JT3 jet jods.

Some magnesium has been used—in the leading edge of the wing, for example. But the majority of the structure is the usual high-strength aluminum alloy.

And one of the Boeing flight test engineers comments: "We're going to have to get used to seeing tricycle landing gears around here again."

About the only departure from conventional practice is in the lateral control system. A Boeing development, the system design really began on the B-47, was refined in the B-52 layout and further developed for the 707. It



BOEING JET STUDIES resulting in 707 (center model) covered hundreds of designs including Stratocruiser modified to take four turboprops (left) and four paired jets (right).

707 Flight Test Log

With Boeing's big new 707 jet transport prototype temporarily on the ground for the installation of ballast and more test equipment, flight test engineers can look back at an intensive program that logged 15 hr. 46 min. of time in the first eight days of flying.

Here is a detailed breakdown of Boeing's tests up to July 22:

- Flight 1, July 15: one hr. 24 min. Program: Low- and medium-altitude shakedown, general handling characteristics, lateral control with flaps extended and retracted, approach stalls.
- Flight 2, July 17: two hr. 25 min. Program: Continuation of low- and medium-altitude shakedown, lateral control, operation of air-conditioning and windshield heating systems. Plane reached 27,300 ft. and 485 mph. true airspeed.
- Flight 3, July 19: two hr. 19 min. Program: High-altitude shakedown, systems and control effectiveness. Plane reached 42,000 ft., exceeded Mach 0.8 true airspeed.
- Flight 4, July 20: one hr. 49 min. Program: Alternate operation of components, manual extension of flaps, simulated "go-around."
- Flight 5, July 20: 21 min. Program: Lowspeed, low-altitude tests.
- Flight 6, July 21: three hr. 55 min. Program: Full-power climb to operational altitude for engine cooling and pressure data, sound level measurements, shutdown and restarting of engines at operational altitudes, normal descent—5,000 to 6,000 fpm.—with airbrakes extended and gear down to test tank vents, performance runs with trailing airspeed bomb to calibrate aircraft speed measuring system.
- Flight 7, July 22: three hr. 33 min. Program: Full stalls, "cold soak" test at high altitude for component functioning, brief formating with the B-52 in simulated refueling.

combines spoilers, ailerons and "feelerons" to give a lateral control system of high effectiveness over the entire speed range of the plane.

▶**JT3 Praise**—There are no reservations in praise doled out by Boeing engineers for the P&WA powerplants on the 707. Repeatedly they emphasize the JT3 is an economical engine and that, with jet transports, pure speed is not enough—you must have economical operation.

"We started thinking about jet transports just as soon as we heard about jet engines," says George Schairer, chief of Boeing's technical staff. "We couldn't restrain some of our people from making design layouts at home at night.

"But it really wasn't until 1948 or so that we knew we were going to have an economical engine. By about the time the B-52 was well under way, we had begun to draw things on paper that looked like the 707."

L. A. Binegar, project flight test engineer on the 707, told AVIATION WEEK there had been no engine trouble to date.

"We had a post-flight conference which lasted only about 45 min." he said. "That alone is some kind of a record. Right near the end, somebody—I think it was George Schairer—asked Tex (test pilot A. M. Johnston) how about the engines, and Tex said, 'Oh, they ran fine.' And that was the end of the conference."

The amount of flight test time racked up in the first few days of flying, especially the 84-min. first flight (AVIATION WEEK July 27, p. 14), reemphasized the reliability of contemporary jet engines and the backlog of engineering and design understanding built up in the field of large jet aircraft.

▶**Bomber Background**—Most of Boeing's jet experience has come from its development, construction and flight testing on the B-47 Stratojet and the B-52 Stratofortress. But the company has not been afraid to junk that experience where new tests or new data showed the way.

Despite more than 16,000 hr. spent in the windtunnel with models of the two bombers, Boeing invested another 1,357 hr. of tunnel-occupancy time plus about $100,000 worth of models in the 707. With windtunnel time currently costing between $600 and $1,000 per hour for highspeed testing, the bill for tunnel tests alone crowded the million-dollar mark.

With vast experience in building thin, flexible, highly stressed wings on the B-47, Boeing turned to a thicker structure for the 707 wing and used thinner skins.

"We have learned as we go along," says Schairer. "The B-47 was the best of what we knew then, but that's a relatively old design. And we know a lot more now."

Another example is the evolution of the lateral controls: ailerons on the B-47 spoilers and "feelerons" on the B-52 and a combination of all three on the new 707.

▶**Around the Plane**—The clean lines of the 707 make it tough to assess its real size, unless the airplane is parked next to a giant B-52. The 130-ft. wingspan puts it somewhere between the B-47 (116 ft.) and the C-97 (141 ft.) in size. Its overall length is 128 ft., longer than either B-47 or C-97. It measures 38 ft. to the top of its folding vertical tail.

Currently flight testing at a weight of 110,000 lb., it is being built up slowly to its design gross weight of 190,000 lb.

On its third flight, the 707 topped 42,000 ft. for high-altitude speed runs. During these, it exceeded Mach 0.8 for a true airspeed of 550-plus mph.

So far, most of the flight testing has been devoted to general handling characteristics and checks of various routine procedures in flight.

The aim of the designers was to get an airplane with the same handling characteristics, approach and landing speeds as contemporary transports. They accepted the fact that a jet transport had

to takeoff faster, but they wanted the same feel as a piston-engine transport takeoff.

Current unstick speed for the 707 is about 120 mph., after a run of about 2,500 ft. on the runway. Even allowing for the fact that the plane is flying light, that is a respectable takeoff for a big jet airplane. Final approaches are flat and slow, with what appears to be plenty of glide-path and lateral control. Touchdown is on the main wheels with the nose held off to increase the drag and slow the airplane.

► **What's Next?**—Boeing's purpose in building the 707 prototype was to have a demonstrator on hand to prove to itself or to prospective customers just what the airplane could do.

"Cost data will be one of the more important by-products of the flight tests," says Ralph Bell, Boeing's director of sales. "It's not easy to estimate costs for these big jets, and we should get some excellent guidance from this one."

One engineer points out that the 707 will be another engine test bed for the JT3 turbojets. "That's not its prime purpose, of course," he says, "but it will be a very useful article to get commercial engine data in operations and maintenance."

The big question remains: "Who is going to buy the 707?"

Right now, no one has announced any intentions along those lines. It is no secret that airline personnel have been making repeated visits to Seattle to discuss drawings, look at the mock-up and see the airplane itself.

But Boeing is making no effort to push commercial sales. There are all kinds of current studies being made on price and delivery dates for commercial prospects, but the real customer Boeing is trying to get is the U. S. Air Force.

The staff believes there is a positive need and a military requirement for a jet tanker; that is the airplane they want to sell. Once they get a firm commitment from the military, then they will have the time to sit down and plan for commercial versions to be sandwiched in along the line.

They feel confident in Seattle that the time is not far off.

Tigers Win Payload Increase for DC-6A

Civil Aeronautics Board has approved a 4,260-lb. payload increase for Flying Tiger-Slick Airlines DC-6A Air Freighters, a move company president Robert W. Prescott predicts will increase operating revenues of the firm by as much as $1 million a year.

Prescott calls the action "one of the most important steps that has been taken to make freight carriage a more profitable operation. Other DC-6A operators are expected to seek similar CAB waivers.

However, the present waiver applies only to Tigers and will not extend to other DC-6A operators. The Board's Bureau of Safety Regulation has been working for some time on a separate set of regulations for air cargo operators. Tigers' application for the waiver now gives the Board a chance to try out for one year under close control and inspection a change in present regulations.

► **32,000-Lb. Freighters**—Flying Tiger-Slick now operates three DC-6As on its transcontinental system and plans to add two more of the Air Freighters this fall. The payload increase means each of the aircraft will be able to carry 32,000 lb. of freight instead of the present 28,000 lb.

"With each airplane averaging one transcontinental flight daily, this means that we can increase our system revenue by more than $25,000 a month per airplane with only a relatively small increase in operating expense and without any modification of the aircraft," Prescott says.

Added operating cost will be about $10,000 a month for the three.

► **Douglas Support**—CAB approval is for one year, with periodic checks by Civil Aeronautics Administration, the manufacturer and the airline. Both Douglas Aircraft Co. and Air Line Pilots Assn. supported the airfreight line in its bid for the increased payload.

Prescott says the aircraft, designed for military and commercial passenger use, actually is overstressed as far as its safety factor for an airfreight operation is concerned. Conversion of part of this excess safety factor into payload makes the DC-6A the most efficient airfreight transport flying today, he says.

► **Provisions**—The Board granted the waiver request with these provisions:

- Zero fuel weight (maximum weight of the airplane with no disposable fuel and oil) may be increased up to 5%.
- Structural landing weight may be increased but not beyond the amount, in pounds, of the increase in the zero fuel weight.
- CAA Administrator must establish inspection periods in addition to those normally performed to safeguard against possible structural distress resulting from the higher operating stress levels.
- Tigers must keep records of all DC-6A flights, including actual takeoff, zero fuel and landing weights.

Time Runs Out on McCarran Bill

CAB asks designation 'supplemental air carrier' and closer regulation of nonsked activities.

Senate Interstate and Foreign Commerce Committee has been asked by Sen. Pat McCarran to report to the Senate before Congress adjourns his 170-page omnibus bill to rewrite the Civil Aeronautics Act.

Realizing his giant bill has no chance of enactment this session, McCarran told committee members during the final day of the three-month hearing: "If this is done, it will be the focal point of all thinking on the subject of aviation. It will get study and analysis during the congressional recess."

McCarran called his bill "the platform" from which Congress can enact new aviation legislation.

"If you don't report the bill," he pointed out, "I sadly fear that all these hearings will have been wasted because the ground will have to be gone over again next year."

► **Nonsked Designation**—Principal point at issue during the final hearing on the bill was the role of the "supplemental service carriers," a name which Civil Aeronautics Board seeks to substitute for "irregular air carriers."

CAB member Joseph Adams told the committee: "The problem of supplemental service which brings before us the problem of the existence and operation of large, irregular carriers is in my opinion one of the most important problems that confronts the Board."

CAB recommends that the definition of air carrier in the bill be changed to eliminate all reference to "irregular air carriers" and a separate definition be incorporated as follows:

"A supplemental service carrier means an air carrier holding a certificate of public convenience and necessity that designates the holder as a supplemental service carrier, which designation was included therein on the original issuance of the certificate."

► **Certificate Limits**—CAB asks that the provision of the bill now dealing with irregular air carrier certification also should be amended to provide that the "authority shall, in issuing any certificate to a supplemental service carrier, include in such certificate such terms, conditions and limitations as are necessary to define the type and extent of the supplemental service authorized by such certificate and to assure that the service offered thereunder does not exceed the authorization."

Member Adams said: "I believe that the supplemental service certificate would offer the greatest opportunity for the Board to carry out your intent in

this matter and I believe that we are prohibited from doing that at the present time. . . .

"I am speaking only of such supplemental service as may be found to be necessary and required and that is not a determinable point."

► **Conditional Permit**—"If supplemental service is demonstrated to be needed," Adams continued, "the Board should be able to not grant an exemption. That's a loose way to handle it and one which gives you almost no control over what you've granted. But we could issue a supplemental certificate to a carrier to render a specific type of service. We could state the number of flights to be operated and the type of equipment to be flown."

Adams urged that supplemental carriers be provided with a conditional certificate that would make it possible to issue less than a full certificate as granted to scheduled carriers today.

"In my opinion," he said, "that would make it possible to meet the needs of the public under isolated cases or cases that come to our attention by such a supplemental certificate award after a hearing.

"The question of supplemental service as it relates to rights of entry, as it relates to the problem of nonskeds for large irregular carriers is one of the most continuing and important problems that the Board has at the present. It will not be resolved without your support of some such amendment as the Board proposes.

"We do not feel that . . . at present," he said, "we have the legal authority to grant anything less than a full certificate and we feel that it is necessary if supplemental service is to be met by a certificate after a hearing which is proposed in the McCarran bill."

Sen. Edwin Johnson disagreed, saying: "I think the law ought to be amended so that there is no such permission given to carriers to render an irregular service in the future. The whole thing ought to be stopped, because it is going to be a constant irritation to everybody concerned and it is not in the public interest."

► **'Rigor Mortis'**—"Only fear I have," said Sen. Mike Monroney, "is that before they can reach this segment of the industry with a pulmotor to give it the proper legislation authority to serve the public, rigor mortis will have set in on those who have the flying know-how to actually do the job."

Senator Monroney asked Adams: "If coach service should be limited to only those certificated airlines and CAB has no control over discontinuance of low-rate schedules, then it would be completely beyond the control of government to maintain that present low price service. Is that correct?"

Adams replied: "Such a possibility arises. That is why I feel that the Board needs your help in amending (the bill) . . . so that to the extent necessary, supplemental service might be implemented.

"I consider the public need," Adams pointed out. "I cannot confine my thinking to the corporate entity that is doing this and whether they should have the right or whether they should make money. All of these things are part of basic transportation and we are under the Act charged with seeing that it is financially stable. I am sure that we have no critics on that score.

"Present commercial air transportation in the U. S. is in marvelous condition in my opinion, financially and in every other way. It is an excellent business today.

"In considering this type (supplemental) of service, I would want to look to the public need primarily."

Delta-C&S Net Profit Drops in Merger Year

Delta-C&S Air Lines, totaling up the balance sheet for its first year of merged operation, shows a net profit of $1,284,000 after taxes for fiscal 1954 ended June 30.

Compared with the adjusted figure for Delta and Chicago & Southern before they merged slightly more than a year ago, this falls way short of the combined net of $4,158,678 for fiscal 1953.

► **Third Dividend**—As a result of the airline's new net profit, the Delta-C&S board of directors voted the third 30-cent dividend per share for the year, payable Sept. 6 to stockholders of record Aug. 20.

The net earnings amount to approximately $2.14 per share or 10% of the current bid and asked price.

President C. E. Woolman says earnings are based on preliminary estimates for June and include gains from equipment sales but no subsidy payment on international routes. The air carrier receives no subsidy for domestic mail (carried at 53 cents per ton-mile) but is fighting for government support on its Caribbean routes.

► **Big Expenses**—Woolman says the net profit for fiscal 1954 dropped $2,874,662 from the combined net of the two airlines for the year before they consolidated because of:

• **Merger cost.** Delta paid Chicago & Southern stockholders $10,695,846 in 5.5% 20-year convertible subordinated debentures for 509,326 shares of C&S stock. Also included is the expense of standardizing equipment, facilities and training plus the legal and administrative work involved.

• **New equipment.** The airline integrated approximately $30 million in new aircraft during the past year, taking delivery on four Douglas DC-7s and placing 20 Convair 340s into service. Six additional DC-7s are on order.

• **Subsidy loss.** The government failed to act on Delta's application for mail subsidies and revoked a C&S payment of $1.9 per ton-mile of mail carried.

Delta also lost its plea for $654,000 in back mail pay on C&S overseas routes when the Supreme Court ruled last February that excess profits from domestic operations must be used to offset international losses (AVIATION WEEK Feb. 8, p. 13).

► **Traffic Increase**—Business boomed for Delta-C&S during the first year of merged operations despite the profit drop. Passengers carried increased 7.6% to 1,732,313, compared with 1,609,622 for the previous year. Revenue passenger-miles totaled 769,646,000 compared with 714,372,000 for 1953.

Available seat-miles climbed 20% to 1,344,021,000, against 1,120,374,000 for the preceding fiscal year.

Woolman also reports a 16.26% increase in mail to 3,366,178 revenue ton-miles, compared with 2,895,353. During the same period, airfreight gained 1.74%, easing upward from 7,060,883 to 7,183,834 revenue ton-miles. Air express totaled 2,385,390 revenue ton-miles.

Iberia to Start New Spain-U.S. Service

Spain's Iberia international airline hopes to inaugurate its first Madrid-New York flight this week under a new amendment to the U. S.-Spanish bilateral agreement giving trans-Atlantic rights to the carrier.

Meanwhile, Japan is negotiating for a similar amendment to its agreement that would add Los Angeles to Japan Air Lines' trans-Pacific network.

► **New Routes**—Iberia will begin its Spain-U. S. service Aug. 3 if Civil Aeronautics Board approves a foreign air carrier permit for the airline before that date.

The amended bi-lateral agreement gives Spain new routes from any of its cities to:

• **New York** via Lisbon, Portugal, and the Azores.

• **San Juan, P. R.,** via Lisbon, the Azores, Bermuda and Caracas, Venezuela, and from San Juan to points beyond in the Caribbean area and the west coast of South America.

► **Japanese Discussion**—CAB met last week with representatives of Northwest Orient Airlines and Pan American World Airways, the two U. S. airlines concerned, and State Department aviation experts to discuss Japan's request.

At present, the Japanese agreement permits JAL to serve San Francisco and Seattle.

CAB ORDERS

(June 25-July 8)

APPROVED:

Intercompany arrangements between Air Cargo, Inc., and Huntsville Transit, Inc., and between various other carriers.

DISMISSED:

Complaint of Trans World Airlines seeking enforcement action against Seaboard & Western Airlines.

Application of Godfrey K. Waters and Overseas National Airways for an exemption permitting Waters to hold positions as an officer and director of ONA and as a director of Bellanca Aircraft Corp.

Alaska Airlines' application for reduced rates on flying aircraft engines and parts from Fairbanks, Alaska, to Seattle, Wash.

Investigation of reduced rates proposed by Pan American World Airways for transporting cargo from San Juan, P. R., to New York.

GRANTED:

El Paso, Tex.; Resources and Development Commission of Little Rock, Ark.; Memphis, Tenn., and its Chamber of Commerce; state of Texas, city and county of Victoria, Tex., and Victoria Chamber of Commerce permission to intervene in Trans-Texas Airways' application for renewal of a temporary certificate for one of its routes.

Flying Tiger Line an exemption to conduct passenger charter flight on or about July 3 from Los Angeles to Athens, Greece.

Tampa, Fla., Greater Tampa Chamber of Commerce and Greater Miami Traffic Assn. permission to intervene in the Northwest-Eastern Air Lines petition for an interchange agreement.

Pan American-Grace Airways permission to use Puerto Viejo Airport in serving Manta, Ecuador.

Trans World Airlines, California Aeronautics Commission, county of San Luis Obispo, Calif., and city of Santa Barbara, Calif., leave to intervene in Southwest Airways' application for renewal of its amended certificate of public convenience and necessity.

DENIED:

Seaboard & Western Airlines' application for authorization to operate four roundtrip flights between New York and Beirut, Lebanon, during July and August.

Pioneer Air Lines' petition for reconsideration of CAB's earlier denial of Pioneer's request to have its application for service between Dallas and San Angelo via Ft. Worth and Brownwood, Tex., consolidated with Trans-Texas Airways' application for renewal of its temporary certificate of public convenience and necessity.

AMENDED:

Continental Air Lines' certificate by eliminating Raton, Socorro, Truth or Consequences and Las Cruces, N. M., as intermediate points on its Route 29 and authorized CAL to serve Alamagordo-Holloman AFB, N. M., as an intermediate point on Route 29 between Albuquerque, N. M., and El Paso, Tex.

FIXED:

Pacific Northern Airlines' mail rates.

(July 9-14)

APPROVED:

Inter-company agreement between Delta-C&S Air Lines and Middle East Airlines Co. and various other air carriers.

Agreements between Pan American World Airways and various other air lines exempting Jugoslovenski Aerotransport from the 44-seat minimum for Convair 240s.

GRANTED:

City of Alexandria, La., and its chamber of commerce; Arkansas State Chamber of Commerce of Little Rock, Ark.; city and chamber of commerce of Atlanta, Ga.; cities and Chamber of Commerce of Longview, Kilgore and Gladewater, Tex., and Gregg County, Tex.; Memphis, Tenn.; Monroe, La.; West Monroe, La.; City and Chamber of Commerce of Shreveport, La.; State Corporation Commission of Virginia and the Washington Board of Trade leave to intervene in Trans World Airlines application to include Tulsa and Oklahoma City, as intermediate points in the additional Southwest-Northeast service case.

Alice, Tex., Chamber of Commerce; policy jury of Calcasieu Parish (county), La.; Lake Charles, La., and Lake Charles Assn. of Commerce; city of Lafayette, La., its Chamber of Commerce leave to intervene in Trans-Texas Airways' application for renewal of its certificate for Route 82.

ORDERED:

A contract in which Southwest Airways

Co. is involved, filed with the Board, withheld from public disclosure.

SUSPENDED:

Individual exemption of Conner Air Lines to permit the company to operate as an irregular air transport.

Letter of registration of California Air Charter.

DISMISSED:

Proposal of Northern Consolidated Airlines to establish group vacation fares between points in Alaska.

Pan American World Airways' proposal to establish a roundtrip charter charge between San Francisco and Naknek.

DENIED:

National Airlines' petition for reconsideration of a Board order denying consolidation of NAL's application for service to Tampa-St. Petersburgh, Fla., and Nassau, B.W.I., via West Palm Beach with that of Mackey Airlines for the same route.

(July 15-21)

APPROVED:

Intercompany agreements between United Air Lines and Eastern Air Lines and various other air carriers.

DENIED:

Disclosure of certain information in the enforcement proceeding against Twentieth Century Airlines, Inc., et al.

ORDERED:

Northern Consolidated Airlines to show cause why CAB should not fix NCA mail rates.

GRANTED:

Capital Airlines a six-month exemption to provide free transportation to seven members of Bell Telephone Laboratories to observe inflight communications aboard its aircraft.

SHORTLINES

► **Air France** is introducing an "unaccompanied baggage" plan, giving a 45% reduction in present shipment rates to travelers anticipating prolonged trips or residence abroad. Baggage is limited to at least 100 lb. of clothing or personal articles.

► **Allegheny Airlines** in June had its heaviest traffic month since inaugurating passenger services in March 1949. The airline flew 4,065,000 passenger-miles, a 35% increase over the same month last year and a new all-time record in any one month.

► **Northwest Orient Airlines** has added a weekly roundtrip aircoach flight to its Seattle-Manila route, doubling NWA tourist service to the Far East.

Additional Employment Advertising on pages 72 & 73

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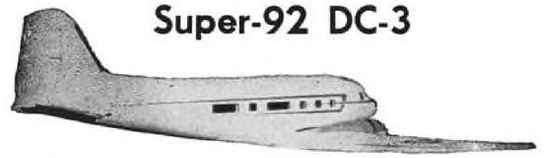

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Eight-Hour Law: Safety or Economics

As predicted here last September (Sept. 14, p. 128), pilot flight time limitations, specifically the "eight-hour law," are now a "topic of considerable interest" in the airline world.

By now the first steps have been taken to change the law and make the operation legal. Saying that the situation is messy only mildly describes it.

Besides not wishing an increase in their working day, the airline pilots are concerned with safety. Granting that under certain conditions the long nonstop can be a choice operation, it also is true that it can be a stinker. There is a common misconception that the eight-hour law effectively prevents a pilot from working in excess of eight hours. Nothing could be further from the truth.

► **More Hours**—All the law does is prohibit **scheduling** for more than eight continuous flying hours. If, because of traffic delays, headwinds, weather, etc., the pilot runs several hours over it all is perfectly legal. In fact, a pilot can take off on a new trip having already logged more than eight hours—he simply has run over his original projected time.

Now if things are changed so that he can be scheduled for 10 or 12 hours, his actual time can run correspondingly higher. Then throw in an extra hour of on-duty before flight, en route stops, ground delays, etc., and it is not hard to envision a staggering work day. True it may be only a small percentage of the time when things work out this way, but who wants to be a passenger during one of these episodes—possibly making an instrument approach during that last hour?

► **Partisan Vote**—Further, who can guarantee that this creeping nemesis, if tolerated for one trip, will not spread to others. In less than a full day's hearing there was a curiously partisan CAB vote—three Republicans "for" and two Democrats "against"—which smelled much more like politics and economics than safety. This perhaps is not surprising, since only one Board member, Joseph Adams, has any worthwhile working knowledge of piloting.

Recognizing the fact that two lawyers rarely can agree on the meaning and intent of a given law, it nevertheless seems that the pilots' case is on firm ground in this dispute. The Railway Labor Act, governing law in all airline labor matters, specifically prohibits changes in working conditions, "whether arising out of the application of (such) agreements or otherwise" without due notice and proper negotiation.

► **Uneasy Standstill**—That Congress desired this act to be sole authority in these matters seems evident from the Civil Aeronautics Act of 1938 which says, "nothing in this subsection shall be deemed to authorize the authority (CAB) to exempt any carrier from any requirement of this title . . . or any rule, regulation, term, condition or limitation prescribed hereunder which provides for maximum flying hours for pilots or copilots."

So CAB's action can only be considered permissive from the safety angle; labor-wise the Railway Act must decide.

As this is being written, things are at an uneasy standstill. They will not remain that way long. Almost to a man, the airline pilots are united on this issue, and from here it looks like they will win by a good margin.

(EDITOR'S NOTE: AVIATION WEEK *gives Capt. Robson an opportunity to express himself freely in this column. Comments from readers on his opinions are welcome.*)

AVIATION CALENDAR

Aug. 7-8—Experimental Aircraft Assn., fourth annual National Air Pageant and second annual fly-in and convention, featuring "home-built" aircraft, sportsplanes, racers and antiques, Milwaukee.

Aug. 9-10—American Society for Quality Control, national conference of Aircraft Technical Committee and first annual Western Regional Conference, U. S. Grant Hotel, San Diego.

Aug. 9-11—Institute of the Aeronautical Sciences, turbine-powered air transportation meeting, Seattle.

Aug. 9-20—California Aviation Education Assn.'s workshop, College of San Mateo, San Mateo, Calif.

Aug. 25-27—Western Electronic Show & Convention (WESCON), sponsored by West Coast Electronics Mfg. Assn. and Institute of Radio Engineers, Ambassador Hotel, Los Angeles.

Sept. 4-6—National Aircraft Show, Dayton, Ohio.

Sept. 6-12—Aviation week, dedication of new air terminal and Jaycee air show, Amarillo, Tex.

Sept. 7-12—Society of British Aircraft Constructors, 1954 Flying Display, Farnborough, England.

Sept. 8-11—Symposium on propagation, standards and problems of the ionosphere, sponsored by National Bureau of Standards, Central Radio Propagation Laboratory, Boulder, Colo.

Sept. 13-24—Instrument Society of America, first International Instrument Congress and Exposition and third annual Analytical Instrument Clinic, Philadelphia.

Sept. 19-21—International Northwest Aviation Council, 18th annual convention, Hotel Vancouver, Vancouver, B. C.

Sept. 21-23—Society for Experimental Stress Analysis, annual meeting and exhibition, Bellevue-Stratford Hotel, Philadelphia.

Sept. 30-Oct. 1—Radio Technical Commission for Aeronautics, fall assembly, Washington, D. C.

Oct. 4-6—Tenth annual National Electronics Conference, Hotel Sherman, Chicago.

Oct. 5-7—Champion Spark Plug Co., 10th annual Aircraft Spark Plug and Ignition Conference, Secor Hotel, Toledo, Ohio.

Oct. 5-9—Society of Automotive Engineers, National Aeronautic Meeting, Aircraft Production Forum and Aircraft Engineering Display, Hotel Statler, Los Angeles.

Oct. 17-22—International Union of Aviation Insurers, annual general meeting, New York.

Oct. 18-22—National Safety Council, Aeronautical Section, Conrad Hilton Hotel, Chicago.

Nov. 8-9—National Aviation Trades Assn., annual convention and meeting, Biltmore Terrace Hotel, Miami Beach, Fla.

Nov. 8-10—Air Industries & Transport Assn. of Canada, annual meeting, Chateau Frontenac, Quebec City.

Nov. 10-12—Industrial Management Society, 18th National Time and Motion Study and Management Clinic, Hotel Sherman, Chicago.

Nov. 15-17—Aviation Distributors and Manufacturers Assn., 12th annual meeting, Mayflower Hotel, Washington, D. C.

ADVERTISERS IN THIS ISSUE

AVIATION WEEK—AUGUST 2, 1954

SEARCHLIGHT SECTION

(Classified Advertising)
H. E. Hilty, Mgr.

LETTERS

Night Copters

I read with interest Dick Balentine's excellent report on National Airlines' helicopter operations in the July 5 AVIATION WEEK, and would like to clarify some of the points involving CAA.

Capt. C. E. Cover, Jr., is quoted as suggesting that "the regulation prohibiting night passenger operation for single-engine aircraft might . . . be waived in the case of the helicopter."

Actually night helicopter flights are not prohibited. However, we do require, in the interest of safety, that any airline undertaking such night operations demonstrate that its pilots can locate a safe place to land in case of engine failure anywhere along the route. The same requirement exists for daylight flights. For night flying, marker lights of some kind probably would be necessary along parts of the route to identify safe landing areas. National Airlines has made no request, as yet, to be approved for night helicopter operations.

There is widespread misunderstanding, too, about the requirements for helicopter pilot ratings.

To obtain a helicopter rating on a private or commercial license, no fixed number of hours must be flown in rotary-wing aircraft. A pilot can obtain his license by flying fixed-wing aircraft in the usual way. Then he can supplement this with whatever rotary-wing flight time is necessary to pass the appropriate flight test. His license then permits him to fly both fixed-wing and rotary-wing aircraft while carrying passengers.

Only in the field of scheduled passenger-carrying helicopter operations are a fixed number of hours' experience in rotary-wing aircraft required. This requirement stems from the necessity for maintaining a level of safety in helicopter transportation equivalent to conventional airline transport.

Formerly, as Capt. Cover points out, 150 hours of rotary-wing time was required of a pilot in command on scheduled helicopter flights. Recently, however, that requirement was reduced to 100 hours for pilots holding an airline transport rating and having airline experience.

A. S. KOCH, Director,
Office of Aviation Safety,
Civil Aeronautics Administration,
Washington 25, D. C.

From an Airways Staff

It was a pleasure to read Capt. Robson's article "60,000 Feet in a DC-3" in the June 28 issue. The captain's presentation of a serious and difficult topic in so few weighty words is a bit of journalistic accomplishment. The magnitude of the problem was well defined and the consequences of continuous delays in its correction were adequately brought into focus.

In my four years as Chief of the Federal Airways Flight Inspection Division, I have expounded on the importance of and the difficulties associated with this operation. However, as the space we flight check is invisible, our efforts lack drama and tangibility, consequently are unnoticed with little public realization of its worth.

On behalf of the 76 pilots, co-pilots and flight technicians, who comprise the federal airways flight inspection staff, I wish to thank Capt. Robson and AVIATION WEEK for the opinions expressed.

ARTHUR E. JENKS, W-320, Chief
Flight Inspection Division
Civil Aeronautics Administration
Department of Commerce, Wash., D. C.

Madsen Lights

Could you send 50 reprints of your article on the Madsen lights which appeared June 14 in AVIATION WEEK ("Taloa Tests Anti-Collision Lights," page 80)?

Thank you for the excellent coverage. The article generated a lot of interest in the industry and the resultant correspondence has been most gratifying. One of the most interesting developments has been with the Boeing Airplane Co. in regard to the Boeing 707. On receiving correspondence from Boeing we had the opportunity to fly the aircraft with the lights to Seattle and display it to the Boeing people . . .

ANDREW MADSEN
Director of Research
Transocean Air Lines
Oakland, Calif.

Voluntary Censorship

Thank you for your letter of June 15, and for the assurances it contained. I think your decision to withhold from public attention information you have obtained about new developments in aeronautics properly falls in the category of a real public service to the nation.

HUGH L. DRYDEN
Director
National Advisory Committee
for Aeronautics
1724 F Street, Northwest
Washington, 25, D. C.

(An editorial June 14 announced that AVIATION WEEK voluntarily was withholding information of a major technical development which appears likely to improve military aircraft characteristics and performance.—ED.)

Viscount Speculation

Why, in about two weeks following the announcement of Capital's purchase of three turboprop Viscounts, have we suddenly licked the turboprop bugs, as announced by an American engine manufacturer and reported in the June 28 issue of AVIATION WEEK? How much longer would it have taken had not the Viscount sale been consummated? It would be interesting to know.

And this by going, all of a sudden like, to a mechanical rather than electronic control system. Tch! tch! Who is kidding who! This could have been done long ago.

Concerning Capital, I regret it was necessary for them to go to an outside source to acquire the desired equipment, but I am glad they had the courage to take the initial step. Perhaps, happily, it will jar some of us out of our complacency and give us a unified and coordinated national aviation policy.

Let's get on the bandwagon! Things happen fast in this day and age and we cannot afford to be second best if we hope to survive. Let's wake up!

GEORGE W. WESTPHAL
820 Greenbrier Rd.
Hagerstown, Md.

Praise

We here at Curtiss-Wright were very much impressed with your editorial comments on "United's DC-7 Record" in the June 7 AVIATION WEEK. Of the many praiseworthy words written about this "dawn to dusk" hop, yours were the first I've seen that probe beyond the glare of the publicity and bring forth the significance of such a flight—"why the jets aren't on U. S. airlines yet."

We would also like to commend Irv Stone on the splendid workmanlike article he did in your June 14 issue on an analysis of the Curtiss-Wright J65 turbojet engine.

RONALD S. GALL,
Director of Public Relations
Curtiss-Wright Corp.
Wood-Ridge, N. J.

. . . We appreciated Frank Shea's article in the June 7 AVIATION WEEK. Hope you will accept these congratulations for their sincerity and overlook the delay.

GORDON GILMORE, Vice President,
Public Relations
Trans World Airlines, Inc.
380 Madison Ave.
New York 17, N. Y.

. . . I should like to order 1,000 reprints of the article on the new Helioplane, written by Erwin J. Bulban, in the July 12 issue. . . . All those concerned with the story are highly pleased with the accuracy and diligence displayed . . . .

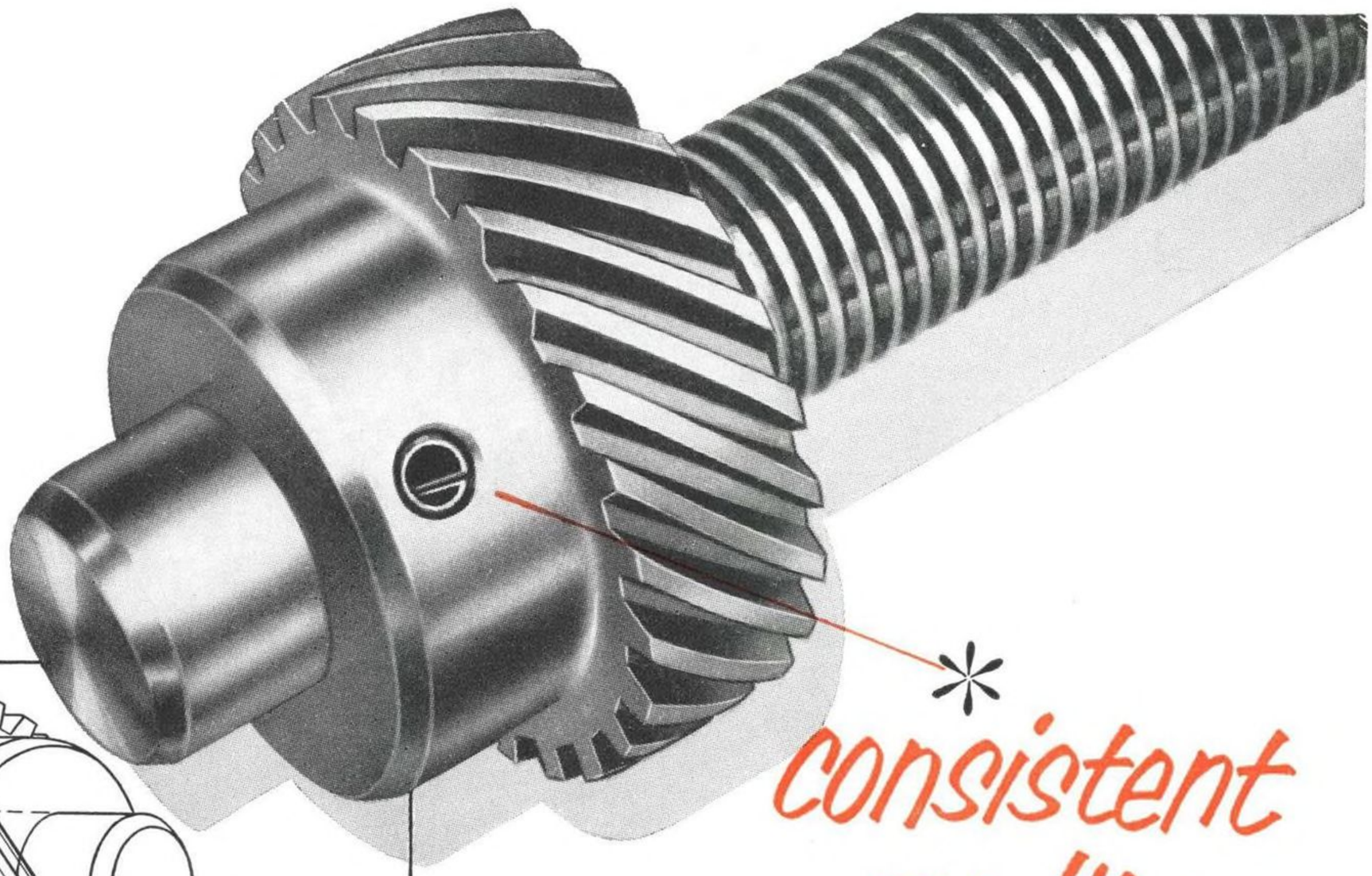
E. B. BERLINRUT
E. THEODORE STERN
230 Park Ave.
New York 17, N. Y.

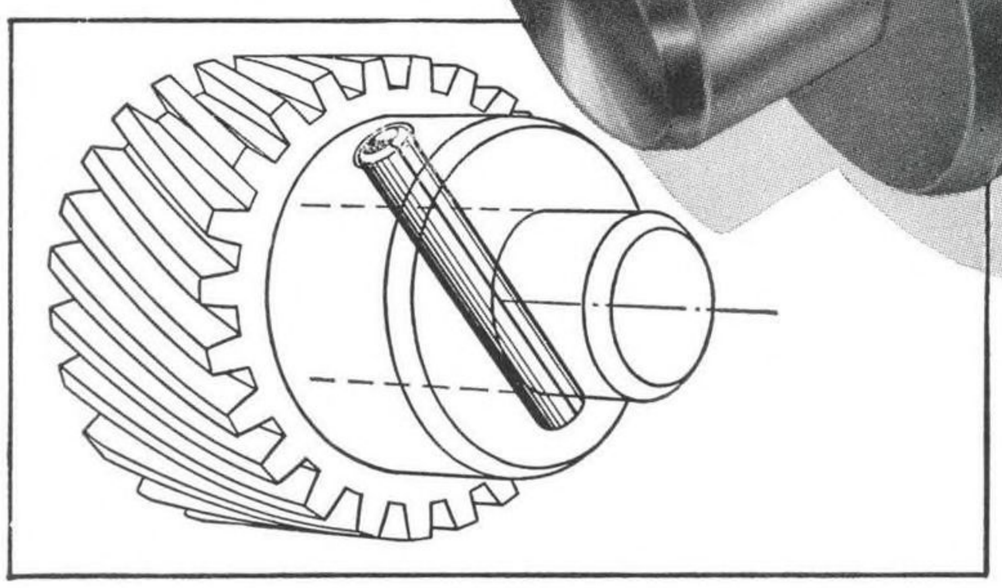
I have just read George Christian's article in the June 7 AVIATION WEEK (New Hoses Meet Needs of Jet Aircraft, p. 75). He has done a remarkable job in presenting a lot of engineering information, which no doubt will be of great interest to all your readers. I have never seen a job handled better.

PETER F. HURST, President
Aeroquip Corp.
Jackson, Mich.

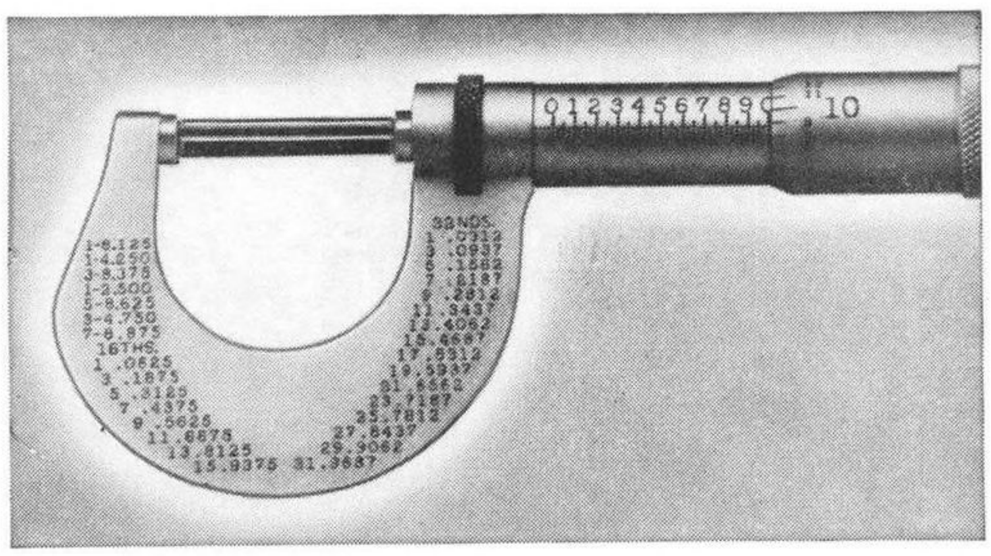
It was a pleasure to see the wonderful job that Bernie Lang did on the story of the Meletron fire in the May 17 AVIATION WEEK. The picture display was very well selected, and the story was a very accurate description of the fire and our recovery from it.

B. E. SMITH, Manager
Public & Ind. Rel.
Meletron Corp.
950 North Highland Ave.
Los Angeles 38, Calif.





To function effectively, a spring pin must drive easily into holes drilled to normal production tolerances, compressing as driven. To drive easily, hold firmly and fit flush, the pin —*every* pin—must meet the strict requirements of specifications such as those prepared by the SAE and the Military Services.



Since failure of a pin can be as costly as a failure of any other precision part, it is important to check the pins *you* buy for uniformity . . . uniformity of diameter and length, shear strength, hardness, insertion and removal forces, and recovery of diameter.

* consistent quality

is as important in the pin as in the gear

Rollpin has been tested many times—by many manufacturers—with a consistently high performance record. It has been widely recognized as the "quality" fastener of its type. In this case, quality can be—and should be—measured. We strongly urge that you test for quality when buying spring pins.

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