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F-111 UNIT HISTORY Vol 1

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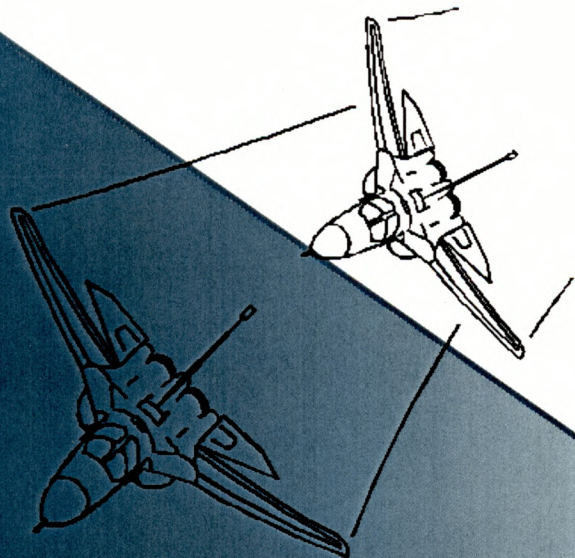
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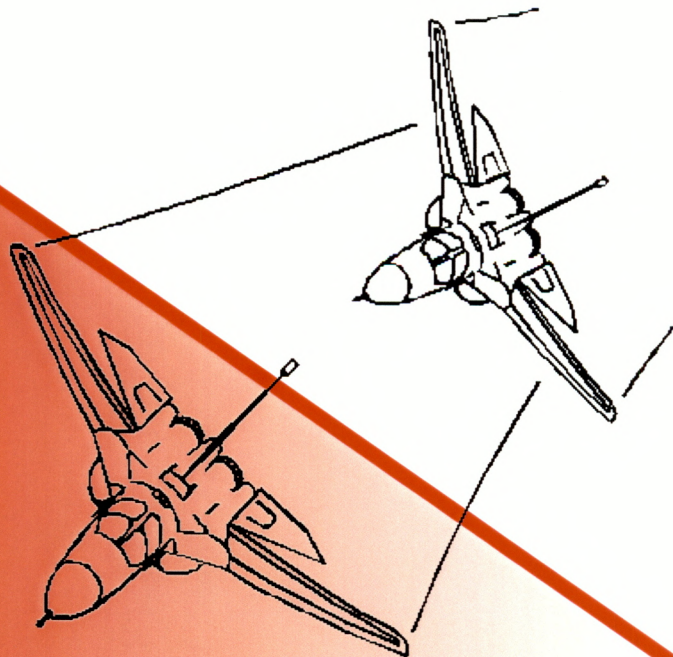
1965 to 1976



F-111 HISTORY

NEWS PAPER CUTTINGS AND
ARTICLES OF INTEREST TO
MEMBERS WITHIN SRLMSQN

AN SRLMSQN PERSPECTIVE



1965

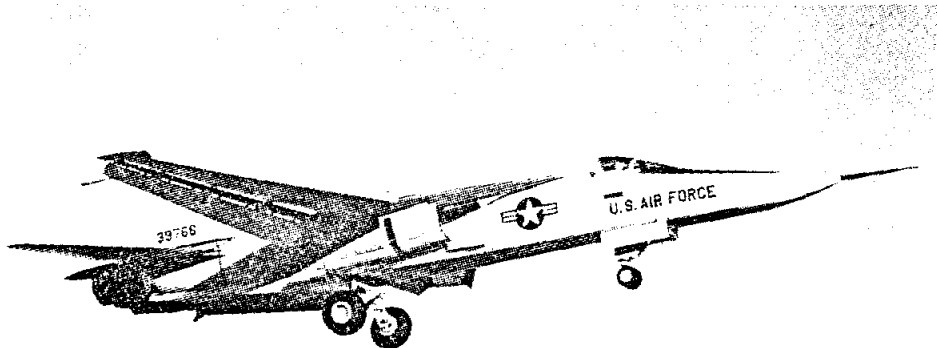
NEWS PAPER CUTTINGS AND
ARTICLES OF INTEREST for
the year 1965

AN SRLMSQN PERSPECTIVE

First Take-Off . . .

F-111 GO WELL

Test flying of the RAAF's new strike aeroplane, the General Dynamics F-111A, is continuing at Carswell AFB.



HISTORIC MOMENT on December 21 when the first take-off of the General Dynamics F-111A occurs at Carswell Air Force Base. Test pilots Dick Johnson and Val Prahl are aboard and all first flight objectives are met.

This flight was made ahead of schedule. Since then other highly successful flights have been made.

● **WATCHING** the first flight of the aircraft was the RAAF Chief of Air Staff, Air Marshal Sir Valston Hancock, seen at right in the cockpit of the aircraft. He flew to America to be present. With him is the RAAF's F-111 project manager, Gp Captain C. H. Spurgeon.

This follows the first flight of the aircraft on December 21, and the second flight on January 6, when the wings were swept fully back to the 72.5 degree position.

The first flight, of 21 minutes, was witnessed by Air Marshal Sir Valston Hancock, CAS, who flew to America for the occasion. The second flight lasted 63 minutes.

In the second flight Test Pilot Dick Johnson took off with the wings fully extended from the fuselage. At an altitude of 10,000 ft, he swept the wings back against the fuselage to 72.5 degrees and then after testing the movable wings in a number of positions, he swung them forward to 26 degrees for a gentle landing in a stiff crosswind.

Testing of the movable wings was 24 days ahead of schedule and earned Gen-

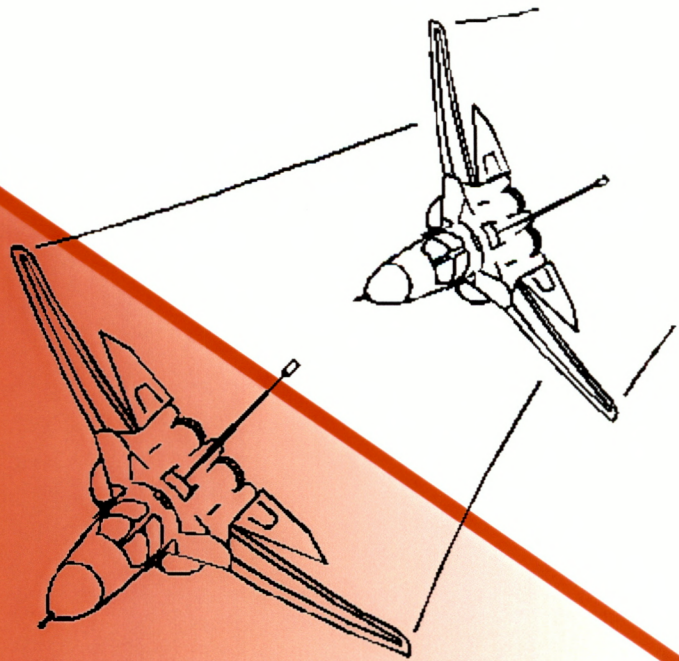
eral Dynamics the first incentive bonus from the Defence Department. Unofficial estimates of the bonus are set at 300,000 dollars.

This was the first bonus for being ahead of schedule, although the roll-out ceremony was 16 days ahead and the maiden flight on December 21, was ten days ahead.

In a Press interview after the second flight, Johnson said that the aircraft had been taken to an altitude of 27,000 ft, at speeds up to 450 mph and the landing speed was about 135 mph.

Future trials will be at speeds above Mach 1.





1966

NEWS PAPER CUTTINGS AND
ARTICLES OF INTEREST for
the year 1966

AN SRLMSQN PERSPECTIVE

F-111 Production Topic For Next KNOW Lecture

Sessions in two Management Association lecture series—KNOW (Knowledge of Neighboring Operations and Work), and the F-111 Familiarization program—continue in August.

J. A. Carmena, supervisor factory methods, will discuss "Preparations for F-111 Production" at the Aug. 17 meeting in the KNOW series.

Carmena's talk will tell "how the proper ingredients of men, material and machinery are meshed together in a coordinated effort to build the F-111 on schedule." Virtually all steps—from cutting chips in the machine shop to flying the airplane—will be explained.

Other KNOW lectures for August are: Aug. 24, "Budgeting, Profit Planning and Your Savings Program," G. P. Nelson, manager of budgets; Aug. 31, "Operations of AFPR Office Operations," Col. John L. Mundorff, AFPR.

In the F-111 series, the "Crew Module" presentation scheduled for Aug. 30 has been changed to Aug. 23; the lecture on "Fuel System," originally slated for Aug. 23, has been re-set for Aug. 30.

The F-111 series opened yesterday with a lecture on "Propulsion," by Cliff Callison. "Pneumatics" is topic for the Aug. 16 presentation, to be presented by Cramer Goad.

Dept. 180 (logistics support) is furnishing speakers for each meeting. W. F. McNeal will discuss the fuel system, while Charley Sloan will make the module presentation.

Also on the agenda in the F-111 series are: "Flight Control," Sept. 6; "Armament," Sept. 13; "Environmental Control," Sept. 20; "Electrical," Sept. 27; and "Avionics," Oct. 4.

Lectures in both series are held from 5 to 6 p.m.

'Management Club' Now 'Association'

"Management Club" has a new name: General Dynamics Management Association of Fort Worth.

The new designation was ratified by membership at the July meeting.

Why the change?

"The style of the old name—General Dynamics/Fort Worth Management Club—was obsolete," said Jim Kenna, president. "And it was generally thought that 'association' sounded more professional than 'club.'"



HONORED — I. M. Laddon, veteran General Dynamics director, is congratulated by Roger Lewis, president of General Dynamics, following establishment of a scholarship in Laddon's name at McGill University.

Scholarship Honors Veteran Director

I. M. Laddon, a director of General Dynamics Corporation and one of the leading aeronautical engineers in the United States, has been honored by the Company with the establishment of a scholarship in his name at Canada's McGill University.

The scholarship was announced by Roger Lewis, president of General Dynamics, at the August meeting of the boards of directors of General Dynamics and Canadair Limited in Montreal.

The meeting marked Laddon's 40th year with the Company.

The I. M. Laddon scholarship represents a continuing stipend of \$5,000 to be awarded annually. It will enable a U. S. resident selected by McGill University to pursue a four-year course of studies leading to a bachelor's degree in aeronautical or related fields of engineering.

"This scholarship has been created in recognition of the education which Mr. Laddon received at McGill and in the hope that it may give other American students the basis for similarly successful careers," said Lewis.

In his remarks, Lewis also cited Canadian-born individuals who received their college education in Canada and later distinguished themselves in the United States.

Among those he mentioned were J. Kenneth Galbraith, the Harvard University economist who served as U. S. Ambassador to India, and Joseph Charyk, the

scientist who became Undersecretary of the Air Force and is now president of the Communications Satellite Corp.

"Canada and the United States," said Lewis, "are closer than any other two large nations on earth. The ties between us run across the entire pattern of human and organizational relationships—in education and the arts, in the professions, in business, in labor and in just about everything from Boy Scouts to Little League hockey teams.

LADDON RECEIVES 40-YEAR EMBLEM

"This is a relationship which we treasure and which we too often take for granted," he said.

Lewis presented Laddon with a 40-year pin set with a diamond and an honor scroll signed by both boards. Its introduction reads:

"Engineer, inventor, designer, administrator, he has contributed for half a century to the furtherance of the science and technology of aeronautics, and in so doing, has nobly served the cause of freedom and of peace.

"Civic leader, Corporate director, family man, honored servant of his government, blunt and honest, he has left an imprint wherever he has been."

Laddon's achievements cited in the scroll include:

His design of the United States' (Continued on Page 3)

Sales, Profits Continue Up

Net sales of General Dynamics Corporation for the six months ending June 30, 1966, totaled \$809,093,000, compared to \$705,670,000 for the first six months of last year, Roger Lewis, president, announced last week.

Net income for the first six months of 1966 was \$22,576,000, or \$2.13 per share of common stock after provision for preference dividends equivalent to six cents per common share, Lewis said. Net income for the first six months of 1965 was \$18,326,000, or \$1.58 per share after provision for preference dividends equivalent to 24 cents per common share.

Net sales for the three months ending June 30, 1966, were \$404,133,000, against \$361,228,000 for the comparable period of 1965. Net income for the second quarter of 1966 was \$13,321,000, or \$1.29 per common share after provision for preference dividends. For the second quarter last year, net income was \$11,186,000 or 99 cents per common share after provision for preference dividends.

"A significant part of the increase in net income," Lewis noted, "resulted from the elimination of provisions for preference stock dividends after April 15, 1966, and the inclusion of profit on the F-111 variable-wing fighter program."

The Corporation began reporting profit on the F-111 program in the third quarter of 1965.

Sixteen of the 23 F-111 de-

velopment aircraft are now being flight tested.

In other aircraft programs, the Convair 600 and 640 turboprop-powered commercial transports have been certified by the FAA for improved landing and take-off performance, and development has begun on the new Canadair CL-215 amphibious utility aircraft.

Thirty CL-215s have been ordered in a water bomber configuration by the Quebec and French governments for use in forest fire control.

Lewis pointed out that General Dynamics' Atlas rocket vehicles are being employed more often in the nation's space programs this calendar year than ever before.

In July, General Dynamics was awarded one of three contracts for development of proposals for the Fast Deployment Logistic Ship program, a Navy project under which a fleet of cargo vessels will be built as a flexible sea-lift force to support rapid deployment of the armed forces.

Since the surface ship facility at Quincy, Mass. was opened in January, 1964, contracts have been won for 14 Navy surface vessels with a value of more than \$385 million, Lewis reported.

In the submarine field, Lewis said, General Dynamics was awarded a \$111.4 million Navy contract during July for construction of four nuclear attack submarines, and a \$3.2 million Navy contract to construct two two-man research submarines.

F-111A Passes Rigid Inspection by AF

Fort Worth division has designed, built and so far flown the F-111A to Air Force specifications.

TAC F-111A No. 14 passed a rigid First Article Configuration Inspection (FACI) by the Air Force July 26, 27 and 28 at Fort Worth.

"Passing such an inspection is usually regarded as a major milestone in the development of any aircraft," said E. E. Clark, FACI chairman for the division. "It means, in effect, that we have established the baseline configuration for production F-111As."

Purpose of FACI is for the Air Force to review the design, and evaluate the equipment perform-

ance and acceptance-test data to determine if the F-111A meets specific military and contract requirements.

Clark said the F-111A's sub-systems and major sub-assemblies had been "incrementally FACI'd" as the program progressed.

At the July inspection, previous FACI's were summarized, F-111A end-item specification validated, reports reviewed, and configuration of No. 14 defined.

Other FACI goals were to review: engineering deviations; design drawings; change control and release procedures; quality control provisions and procedures; qualification test status and safety-of-flight certifications; airplane end-item specification; configuration identification index; historical records procedure; and status of engineering critical specifications.

Col. M. K. Andresen was FACI chairman for System Project Office. He was assisted by Capt. R. B. Frey, R. J. Gatenbee, and A. K. Givens and James Bush of Sacramento Air Materiel Area.

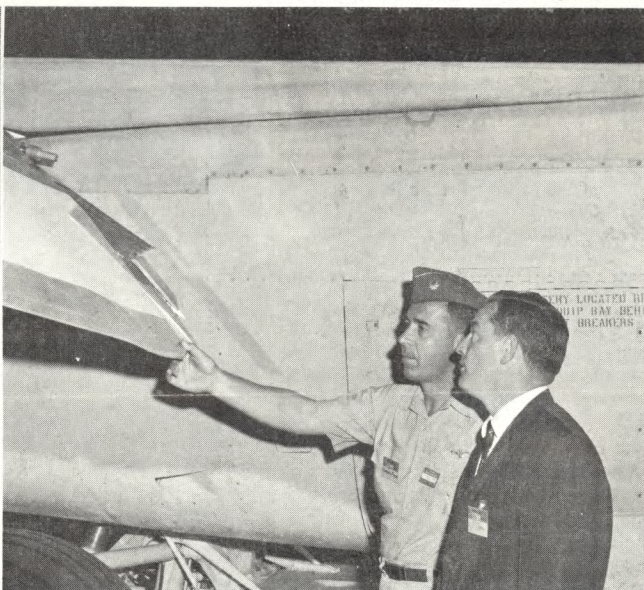
Air Force Plant Representative's Office personnel included Maj. C. B. Fyock, J. T. Bell, H. L. Cox, C. Hensarling Jr., J. W. Johnson, and A. Schultz.

Fort Worth division personnel assisting included H. J. McIntire, manager of Dept. 105, B. Brown, A. E. Clement, A. J. Duban, C. A. Heim, C. E. Kinney, Al Mair, A. E. Northcott, D. W. Rhodes, and J. J. Walden Jr.

T. Placek and T. Walker represented Grumman Aircraft Engineering Corp. and D. M. Brownell represented Electronics division at the inspection.



ANOTHER MILESTONE—Col. M. K. Andresen, F-111 SPO FACI chairman, signs acceptance papers with, from left: R. J. Gatenbee, F-111 SPO; E. E. Clark, FW FACI chairman; and J. W. Johnson,



FW AFPRO. In photo at right, Major Charles Fyock of Sacramento Air Materiel Area looks over wing during FACI, aided by FW's J. G. Jones of configuration management.

Time Keeper Developed For Tracking Stations

An advanced, compact, time generator for pinpointing exact time of operations in tracking and data processing systems has been introduced by Electronics division operations at San Diego.

The Model 173, as it is designated, was developed for use in the Applications Technological Satellite Range and Range-Rate Tracking System (ATSR) being built for NASA Goddard Research Center under a contract received late in 1964. ATSR systems have been installed as part of ground tracking sites at Goldstone, Calif., Rosman, N. C., Toowoomba, Australia. A fourth is going to Japan for installation prior to launch of the first Applications Technological Satellite this fall.

The time generator, as heart of the timing system, develops all reference signals, time code, and time-of-year (days, hours, minutes, and seconds) information for the tracking station.

The Electronics-developed time generator was the first all-integrated circuit single-unit time generator, and first to have all functions of the timing system combined on a single chassis. Space requirements are reduced from 45 inches of rack space necessary for the various components of conventional time generators to 10½ inches of vertical panel space.

The unit is completely self-contained with an integral emer-

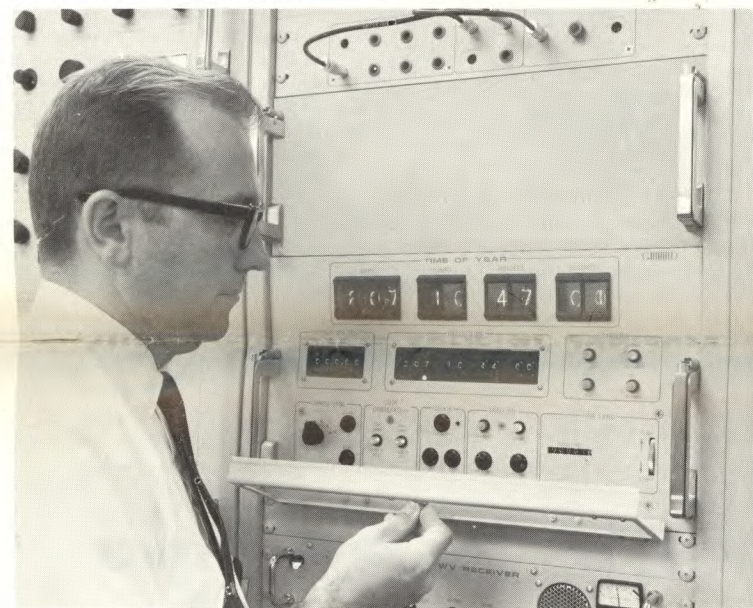
gency power supply which provides for more than five hours of operation in event of external power failure. Required battery power is reduced from 200 watts to 12 watts, O. D. Greenwood, senior electronics engineer in Electronics ground electronics group, said.

"The use of integrated circuits made it possible to design a time generator much more compact than any other type available at that time. The Electronics-developed unit acts as a highly precise clock, providing extremely accurate identification in point of time of occurrence of events. It counts millionths-of-seconds time intervals and translates these into time-of-year and other electronic signals.

"It develops signals which indicate time-of-year in special codes used by the tracking system, and special controls enable it to synchronize time measurements to the National Bureau of Standards' master station, or any other master station, to within fractions of a second.

"The Model 173 time generator may be employed wherever a source of accurate time information is required."

Greenwood has been responsible for design of timing and data subsystems in the ATSR program. James Van Caster is ATSR project engineer for Electronics-SD.



"TIME RECORDER"—O. D. Greenwood, senior electronics engineer at Electronics - San Diego, releases cover on newly-developed Model 173 time generator, first all-integrated circuit single unit type. Electronics' device will be used to time-tag operations in ground tracking systems.

General Dynamics Awarded One of Three 'FDL' Contracts

General Dynamics Corporation, Litton Industries Inc., and Lockheed Shipbuilding and Construction Corp. are receiving identical contracts, each in the amount of \$5,275,000 for development of fast deployment logistic ship (FDL) package proposals, plus \$90,000 a month for maintaining a cadre of key personnel from the time

proposals are submitted to the time a contract is awarded for the total package. The Navy's FDL project office states that proposals are due Jan. 31, 1967 and the total package is planned for award in June, 1967.

Each contract covers development of performance specifications and preparation and submission of a total package proposal for design, construction and delivery of FDL ships. The fast deployment logistic ship will enhance U. S. military rapid deployment capability by providing a high-speed, flexible sea lift force capable of rapid overseas deployment of tactical land force units in conjunction with air lift.

FDLs will be able to store embarked land force equipment and supplies aboard ship in a controlled environment for protracted periods in readiness for immediate use. In times of emergency, equipment could be unloaded either at established ports or over the beach in the absence of port facilities. Air lifted personnel would then marry-up with this equipment.

General Dynamics work under its contract will be performed at the Quincy, (Mass.) division.

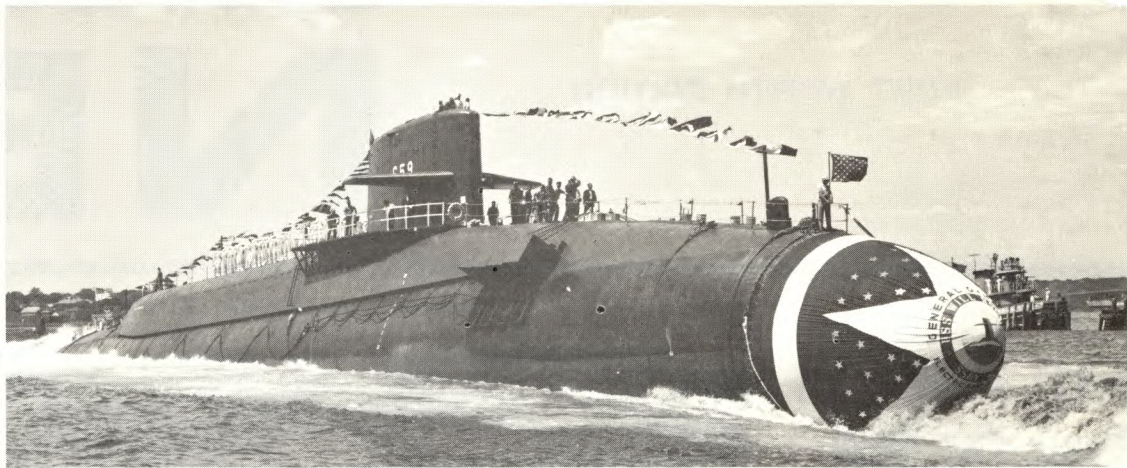
The Naval Ship Systems Command is awarding contracts for the FDL ship project office.

FDL Proposal Includes Film

Fort Worth division movie section recently completed a 24-minute color movie for General Dynamics' Marine System Group.

The film is being used in the Corporation's proposal for the Navy's Fast Deployment Logistic program. It shows the capabilities of Electric Boat, Electro Dynamic and Quincy—the three divisions comprising the marine group.

A motion picture crew of Jerry Ratliff, director, Gordon Smith, writer, and James Hayden, cameraman, visited each of the divisions in making the film. In-house work was done by Nick Mertes, animation camera; R. M. Benson, art; and Jack Thompson, editing.



NEARING GOAL—Polaris submarine Will Rogers slides into Thames River during launching last month by Electric Boat division. The 41st Polaris submarine, the launching of Will Rogers puts Navy within reach of goal of that number of missile-firing submarines in operation by next year.

S-C Will Build Training Aid For NASA Use

Stromberg-Carlson has received a \$239,797 contract to provide voice communications equipment that will be used during simulation of operational conditions of a manned space program.

The equipment will assist in personnel training at NASA's Manned Spacecraft Center in Houston, Texas. Philco Corp., Houston Operations, a subsidiary of the Ford Motor Co., awarded the contract.

The equipment will be capable of originating, receiving and monitoring a wide variety of voice communications simulating operational conditions at voice ground stations. The system will train flight controllers in the use of facilities in preparation for placing an Apollo manned capsule in orbit.

S-C is furnishing similar communications equipment for the U. S. Navy at the Atlantic Fleet Weapons Range, Puerto Rico, and for use aboard three General Dynamics-built Apollo Range Instrumentation Ships.

F-111 Air Time Passes 1,300 Hrs.

Air Force and Navy F-111s had logged nearly 1,303 hours aloft on 798 flights through July. Supersonic speed was reached on 290 of the flights.

F-111As, the Air Force version, had made 699 of the total flights, logging over 1,170 hours in the air; Navy F-111Bs had logged nearly 134 hours on 99 flights.

Category I and II testing of the variable-wing fighter continued to "progress satisfactorily" at Fort Worth division, Edwards AFB, Eglin AFB, and Grumman's New York facility, where the F-111B test versions are checked.

Latest F-111A off the assembly line at Fort Worth is TAC No. 15, which is being prepared for first flight.

Nos. 16 and 17 are in final assembly, while No. 19—first plane in the production program—has been fuselage-mated.



BIRTH OF A SHIP—A 50-ton keel section for Navy ammunition ship USS Butte was laid last month at Quincy, Mass., division, marking fourth new ship started this year at shipyard. Butte's sister ship, USS Kilauea, was started March 10.



SEND OFF—Mrs. Hubert H. Humphrey christens Polaris submarine Will Rogers. Watching, left to right, are Vice Adm. Vernon L. Lowrance, Commander, Submarine Force, U. S. Atlantic Fleet; J. William Jones Jr., president of Electric Boat, and Roger Lewis, president of General Dynamics.

EB Will Help Design 'Island' For Floating Arctic Research

Conceptual design contracts for a unique man-made floating research island, to carry scientists into the ice-laden waters of the Arctic Basin have been announced by the National Science Foundation.

Contracts, to be completed within four to six months, were awarded to Electric Boat division of General Dynamics, Groton, Conn.; M. Rosenblatt & Son, Inc.; and Westinghouse Defense and Space Center.

The free-drifting hull would serve as a platform for scientists conducting research in subjects such as meteorology, physical and chemical oceanography, the heat budget of the area, marine biology, upper atmosphere physics, glaciology, and entomology.

Goal of contracting firms is to produce designs for a vessel of such strength that it will withstand the terrific stresses and pressure of drifting pack ice and of such shape that it will divert the destructive forces of the ice to avoid their full power.

The platform would have living and working space for about 45

scientists and crew and would carry food and fuel for several years. Its facilities would include scientific laboratories, shops, deep sea winches, hospital, a helicopter pad, and a hangar for a small fixed-wing aircraft.

As presently planned the Arctic drift barge will be towed through the Bering Straits and released in the Arctic pack ice. It is expected that the barge will then drift north and upon nearing the North Pole will either continue through to the Greenland Sea or go into a clockwise circle moving down toward Canada.

The design firms have been asked to consider a small nuclear reactor as a source of internal power for the drift barge. The possibility of using waste heat or steam to melt ice gripping the hull will also be studied.

Electronics Earns Additional Order

A \$3.5 million additional order for AUTODIN digital subscriber terminal equipment for use in the military digital worldwide network has been received by Electronics division.

The new order was placed by the U. S. Army Electronics Command and is in addition to the \$44.9 million received by the division in June, 1965.

Australia Exhibit To Include Redeye

Redeye, world's smallest guided missile system, will be on display at the Army Fire Power Exhibition in Canberra, Australia, Aug. 26.

The display, which includes a Redeye launcher and missile as well as systems application photographs, will also appear at an Australian Army staff weapons review in Canberra Aug. 14-18.

The Redeye shoulder-fired missile system is in production at Pomona division for the U. S. Army and Marine Corps.

Scholarship Honors Veteran Director

(Continued from Page 1)
first all-metal aircraft.
His pioneering role in the development of all-metal wing construction, integral fuel tanks and quickly demountable power plants.
GUIDED DESIGN OF PBV SERIES

His design of many devices for which he won patents; for example, the Bendix-Laddon disc wheel and integral brake which became standard aircraft equipment in the late twenties.
His design of Consolidated Aircraft's twin-engine flying boat, the XPY-1, for the Navy. The airplane was adapted for commercial operation as the "Commodore."
His guiding role in the design, development and construction of the PBV, which distinguished itself in World War II. Incorporated in it was the first integral wing tank, the key to the capability of commercial transports to carry sizable payloads across the Atlantic.

His supervision of the development and production of the World War II B-24 bomber, the famed "Liberator."
His engineering leadership in the conception and design of the

post-war B-36 intercontinental bomber and later, as Convair executive vice president, his supervision of the bomber's development and early production.
His direction, after World War II, of the development of the twin-engine Convair-liner transport.
His establishment of the research and development organization at Vultee Field, which created the early concepts that led to the Terrier missile, the Atlas space vehicle, the Delta-wing platform and hence the F-102, F-106 and B-58.
"To this day," the two boards continue in their scroll, "his foresight, his wisdom, and his talent in leading and training men continue to serve and guide this Corporation's progress and growth, and it is our expectation that his energy and enthusiasm and good humor will long support us."

FORMER CHIEF ENGINEER

An automotive engineer in Detroit before World War I, Laddon joined the U.S. Air Service Engineering division and became chief of its design branch at McCook Field in 1919. From 1927 to 1935 he served as a chief engineer at Consolidated Aircraft; he was elected to the board of directors in 1931.

From then on he rose to vice president-engineering, 1935-1939; vice president in charge of engineering and works and general manager, 1939-1941; and executive vice president and general manager, 1941-1943. With the merger of Consolidated Aircraft and Vultee Aircraft in 1943, he became executive vice president of Consolidated Vultee (Convair). He resigned from that post in 1948 and continued to serve as a director. In 1954 when Convair became a division of General Dynamics, he was elected a director of the Corporation.

Laddon was born in Garfield, New Jersey, in 1894. He received a B.S. degree and an honorary doctor of science degree from McGill University.

Paschal to Present Paper at Congress

Frank L. Paschal, FW health physics administrator, will present a paper at the First International Congress of the International Radiation Protection Association in Rome, Italy, Sept. 5-10.

The paper is "A new concept in film badge design," authored by Paschal, J. D. Eastes and M. L. Maurer. It reviews the concept used in the new personnel monitoring badge installed at Fort Worth division last year.

Paschal is among 18 delegates selected by IRPA to attend. He formerly served as secretary and member of the directorate for the organization.

IRPA is comprised of national and regional societies.

People Mobility

Interdivisional Transfers

(Following are recent personnel transfers among General Dynamics divisions. In parentheses are dates when individuals joined the company.)

CHARLES G. JULIUS JR. (1961) from Convair division to administrative assistant, General Atomic; **GEORGE E. WILLIAMS** (1941) from Pomona to tool engineer, Convair; **HELMUTH H. LAUE** (1958) from Electronics, San Diego to electronics engineer-senior, Convair; **FRANK BERRY** (1957) from Electronics, San Diego to Convair as assistant foreman; **GERALD S. MATHEWS** (1956) from Convair to logistics, Fort Worth; **JOSEPH F. SYLVIA** (1959) from Convair to logistics, Fort Worth; **JOHN R. WEAVER** (1953) from Convair to Pomona as assistant foreman; **ALLEN E. LANGE** (1963) from Convair to senior electronics engineer, Pomona; **KLAYTON M. HEMMINGSON** (1952) from Convair to assistant foreman, Pomona; **WALTER E. COVINGTON** (1952) from Convair to senior staff, Canadair, Ltd.; **JOSEPH CATALINO** (1950) from Convair to Electronics, Rochester as manufacturing control analyst; **ARTHUR L. CONRAD** (1943) from Convair to chief of PERT, Quincy; **FRANKLIN D. MARTIN** (1959) from Electronics, San Diego to Electronics, Rochester; **JAMES H. GURLEY** (1963) from Electronics, Rochester to Washington, D. C. field office; **JOHN D. HUNT** (1965) from Electronics, Rochester to Quincy; **ALBERT R. EVANS** (1951) from Electronics, San Diego to electronics engineer-senior, Convair; **THOMAS G. FLEMING** (1952) from Electronics, San Diego to Convair military space programs.



SUPERSONIC TANK—F-106A is updated with new version external fuel tank for which Convair division has contract to produce 271 for Air Force. Wing tanks can be carried at supersonic speeds; refueled in flight; and jettisoned, if necessary. They will be installed on F-106 aircraft by AF.

F-106 TACAN Contract Won By Electronics

A \$6.2 million contract for U. S. Air Force F-106 interceptor tactical air navigation (TACAN) systems has been awarded to Electronics division, Rochester, by Hughes Aircraft Co.

The new TACAN production unit, the first to use micro-electronic circuitry, will reduce to one-third the size and weight of the present F-106 system. It is designed to provide 450 hours of maintenance-free operation because of microelectronic circuitry. TACAN is part of the MA-1 radar armament control system that Hughes originally built for the F-106.

TACAN provides F-106 pilots with range and bearing from ground stations and range between planes equipped with similar TACAN. Range information between planes is used for rendezvous and refueling operations. A built-in digital computer, rather than the analog computer previously used, will provide faster and more reliable information to the pilot.

The TACAN unit which Electronics division will build will have built-in self-test gear to check out the operational status of the system. The self-test automatically checks the bearing and range accuracy, power output and antenna operating condition (voltage standing wave ratio). Present F-106 TACANs do not have self-test capabilities.

If a component in the unit fails, the pilot is warned immediately, and he can use other navigational aids. Indicators on TACAN will spot the non-working component for replacement by ground maintenance crews.

Tuning of the new General Dynamics TACAN is totally electronic rather than electromechanical.

Forty per cent of the newly developed TACAN is of micro-electronics construction. Only four vacuum tubes are used. Ultimately these tubes will be replaced by solid state amplifiers.

Electronics Plans Expansion of Lab

A new \$400,000, two-story building will be erected by Electronics division on plant grounds at Rochester, Parker Painter Jr., general manager, reported.

The building will add 10,200 sq. ft. to present laboratory facilities.

Aircraft Engineers Go to Sea For ASW Study Aboard Carrier

Seven engineers from Convair division's advanced military aircraft programs study group are aboard the USS Bennington off the West Coast for a week observing anti-submarine warfare (ASW) aircraft operational training exercises.

Since January the division has been conducting a one-year unfunded study on carrier-based ASW aircraft for the U. S. Naval Air Systems Command.

Earl W. Boteler, manager of advanced aircraft programs, is directing the study group's activities on the Bennington. Others participating are Sterling V. Starr, Robert R. Wahler, Duane D. Johnson, John A. Turner, Albert W. Morgan and Frank Machado Jr.

Nine other engineers from the group previously spent a week aboard the USS Hornet off the West Coast observing pilot carrier qualification operations and studying ASW aircraft maintenance and handling problems.

They were Robert G. McGeary, Richard C. Lingley, Clark Kerr Jr., Stanley T. Piszkin, William A. Floyd, Wesley E. Woodson, Charles W. Chapman, Oliver F. Oldendorph and Raymond J. Frindt.

W. D. Wood, manager of military requirements, said information obtained by the two groups aboard the carriers will support both Convair division and General Dynamics ASW study activities.

"We are putting a lot of emphasis on building up an understanding of carrier-based aircraft," Wood said. "Knowledge gained also will be useful in establishing design criteria for future aircraft needs such as a VSX replacement for the currently operational S2E anti-submarine, carrier-based aircraft."

If one copy is sufficient, why order more?

Marines in Viet Nam Use Tents Built at Ardmore Facility

General Dynamics' Ardmore, Okla. facility is turning out a variety of portable, quick-erect tents for the Marine Corps.

The facility is working on a firm order for 160 of the small "Sentinel" expandable shelters and has a request for 180 of a larger model.

Two prototypes of a nose dock — designed to cover the nose section of most military fighter planes — have been delivered to the Marine Corps for evaluation.

The smaller tent is 10 feet wide, 20 feet long and 8 feet high. It folds compactly into a case 26 inches wide, 6 inches deep and 8 feet long. Two men can erect it — the tent unfolds like an accordion — in about 30 seconds!

Forty are being used by combat Marines in Viet Nam as command posts, advanced first-aid stations and temporary barracks.

The larger version measures 16 feet wide, 10 feet high and 35 feet long when expanded — providing 600 sq. ft. of floor space.

The larger version can be used for equipment maintenance, advanced hospital units or warehouses.

Made of aluminum and high-quality aerospace textiles, the tents are lightweight and durable.

A portable nose dock was demonstrated to Marine Corps representatives at Fort Worth division recently. The dock was "fitted" to various Marine Corps fighter aircraft of types now being used in Viet Nam. The one dock configuration adequately covered all planes — plus the F-111A.

A small crew erected the dock in five minutes and moved it away in less time.

Expandable Tent Patent Issued

Phil Cummins, Fort Worth division Dept. 15-0, has been issued a patent for a Multi-Purpose Utility Structure — an expandable tent.

The tent has an expansion ratio of 40 to 1.

In addition, the side walls fold inwardly, reducing the package size and providing a self-contained metal "container" around the tent when in stored condition.



TENT MAKERS — Tents for the Marine Corps are being produced at General Dynamics' Ardmore, Okla. facility (center photo foreground). One type, a quick-erect nose dock for aircraft to permit work in inclement weather is demonstrated

at left. At right, patent certificate for expandable tent is presented to Phil Cummins, center, inventor, by C. M. Woodward, patent counsel. Clyde Ford, Ardmore manager, is at right.