COMSAT NEWS

January-February 1975
Vol. X No. 1

New dental plan: a major benefit for COMSAT employees

A landmark benefit has recently been added to other benefits provided employees of COMSAT and COMSAT General with the introduction of the "COMSAT Dental Plan". In placing the program into effect corporation wide, COMSAT moves into the forefront of organizations offering this valuable service to their employees.

The Personnel Office has published and distributed a pamphlet spelling out specifically what opportunities the new plan offers. However, although the pamphlet is quite informative and complete, for those (your editor included) who habitually skim over the "fine print," we have created a hypothetical employee who can be depended upon to call on the Personnel Office with questions.

Please keep in mind that in the following dialogue reference to COMSAT and its employees includes COMSAT General and benefits discussed are applicable to employee and dependent alike. —THE EDITOR

Q. Who is covered under the new plan?

A. All regular, full-time employees of COMSAT.

Q. What does it cost to participate?

A. For employees, not one cent.

Q. What do you mean by a full-time employee?

A. Regular employees on the company payroll as of February 1, 1975. Those who join the organization after Feb. 1 become eligible on the first day of the calendar month following their sixth month of service.

Q. Can dependents be included in the program?

A. Absolutely. A wife or husband is eligible, unmarried children under 19 years of age, unmarried children over 19 years of age but under 26 primarily dependent upon the employee for maintenance and support and while attending school on a full-time basis, and unmarried children 19 years or older who are chiefly dependent upon the employee for support and maintenance and are incapable of self-sustaining employment because of mental or physical handicap which began prior to age 19.

Q. What is the cost for dependent participation?

A. $2 per pay period.

Q. Is that $2 per dependent?

A. No. The $2 covers all eligible dependents specified in the plan.

Q. Does participation by a dependent entitle that dependent to the same benefits as the full-time employee?

A. Exactly the same.

Q. As a participating member, what out-of-pocket expenses will I have to pay? In other words, what is the cost to me for services rendered me or my dependents.

A. OK, let's take it a step at a time. First, the cost to you to participate as a full-time employee is nothing. Second, the cost for eligible dependents is $2 per pay period. Third, for services other than orthodontic, a $25 deductible is applied against covered dental expenses of at least one person per family unit each calendar year with a maximum family calendar year deductible of $50. An added attraction of the deductible clause is that any covered dental expense incurred during the last three months of a calendar year, and used to satisfy all or part of the deductible for that year, may be used to satisfy all or part of the deductible for the following year.

Finally, after satisfying the deductible (maximum of $50 per family per calendar year), the Plan will pay 80 percent of the reasonable covered dental expenses for general dentistry and 50 percent for crowns, fixed bridgework, inlays, gold fillings and full and partial dentures. *The maximum benefit payable in any calendar year is $750 for each covered individual.*

For orthodontic service, after satisfying the deductible, the Plan pays 50 percent of covered charges per course of treatment for each person up to a lifetime maximum of $500 per person.

Q. Suppose I'm just interested in having my teeth cleaned, you know, nothing really serious?

A. The plan is designed to encourage preventive care of the teeth, in other words, general dentistry to include treatment with maximum reimbursement allowed for such items as teeth cleaning once every six months, fluoride treatment once each calendar year, space maintainers for dependent children under age 19, etc.

Q. What do I do if an emergency develops and I require immediate attention?

A. Emergency visits are covered by the Plan. If treatment is provided on the same day as the emergency visit, benefits will be based on the covered treatment.

Q. How about if I suspect I have a problem requiring attention, am I entitled to examinations of any kind?

A. The Plan covers oral examinations, X-rays, and laboratory tests that may be necessary to determine required dental treatment. However, a full-mouth X-ray of all teeth taken as part of a general examination is covered only once in a three-year period.

Q. OK. So I've been examined and my dentist decides I need some teeth pulled?

A. Under the Plan you are covered for all extractions or other necessary oral surgery.

Q. Are basic items like anesthetics or medicines included in such treatment?

A. A separate charge for general anesthetic is covered when it is required for normal treatment in conjunction with oral surgery, periodontics, fractures or dislocations. The Plan also covers charges for injectable antibiotics administered by a dentist or physician.

Q. Now that I've been examined, extractions or oral surgery performed, and I need some replacement work, what can I get?

A. Fillings and crowns necessary to restore the structure of teeth that

(Continued on page 4)

News in Brief

DIGISAT demonstration

DIGISAT demonstration for representatives of press, government, industry and carriers displays unique capabilities of satellite digital transmission.

Landmark employee benefit approved

With the approval of the "COMSAT Dental Plan," the corporation moves into the forefront of organizations providing this valuable service to their employees.

R&D program for 1975 gets OK

The thirteenth meeting of the Board of Governors approves a research and development budget in excess of $5 million.

General McCormack dies at 64

Maj. Gen. James McCormack, former Chairman and Chief Executive Officer, COMSAT, dies at his winter home at Hilton Head, S.C.

Religious services carried by satellite

Holy Mass and the Muslim pilgrimage to Mecca carried over three-ocean satellites during Christmas Season.

Matt Gordon retires

Matthew Gordon, Assistant Vice President for Public Information and a COMSAT "original," leaves Corporation as of March 1, 1975.

Schwartz named Director, Public Information

Corporate Secretary's Office and Public Information combined. Robert B. Schwartz to head both.

COMSAT General assists TV News

Television News, Inc., an independent news service for television stations, provided technical assistance by COMSAT General.

Film documentary awarded trophy

COMSAT's film documentary, "Ten Years To Tomorrow," receives citation and trophy from Union of Italian Aerospace Journalists.

Saudi Arabia satellite TV inaugurated

Reprinted from the Weekly Newsletter published by the Saudi Arabian Ministry of Information.

CEA elections held

New slate of officers elected for 1975 by COMSAT Employees Association.

Special features:

COMSAT's Operations Center: a window to the world by Lawrence A. Covert and John J. Peterson.

Labs First Aid Team: trained and capable by Betty H. Mowen, R.N. with photos by Bill Megna.

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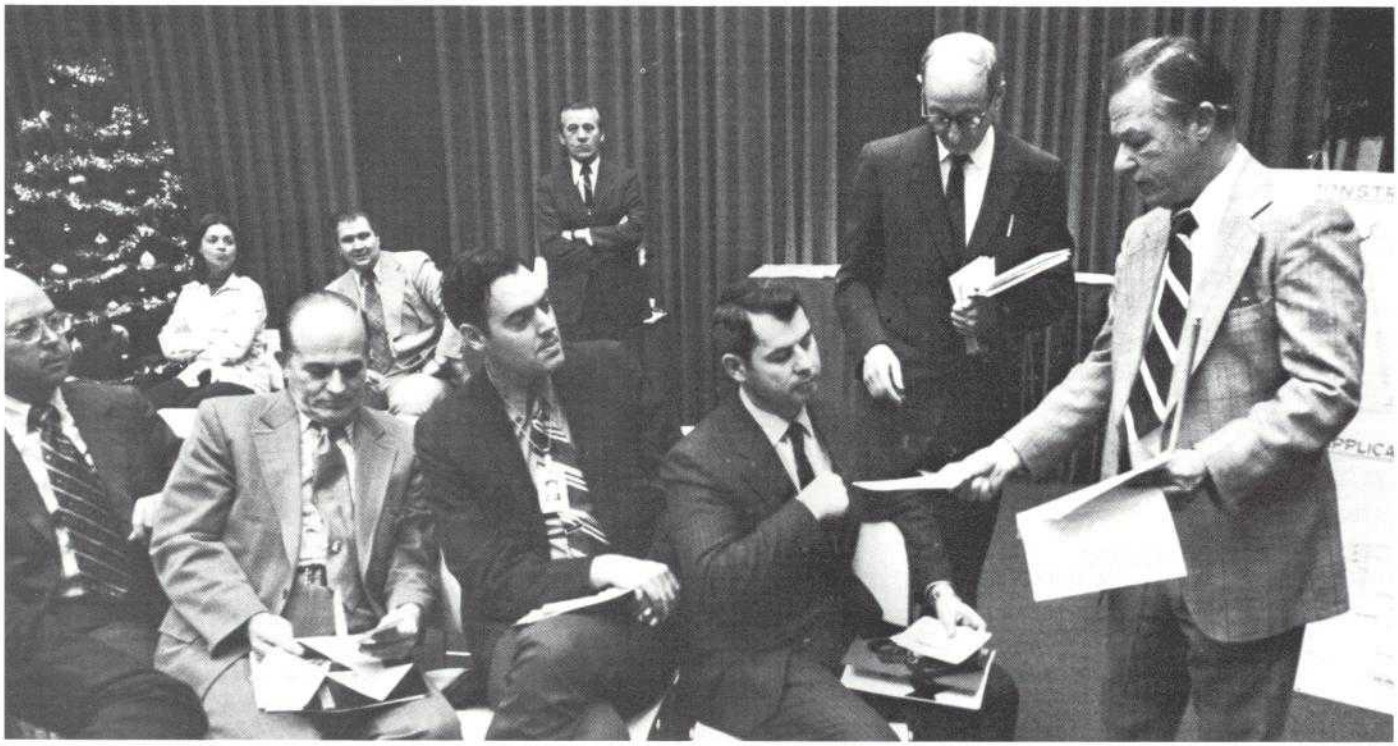


Service Development Director George A. Lawler (right), hands Defense Communication Agency officials facsimile copies of material transmitted and received via a double-hop DIGISAT satellite circuit. Left to right are: Cdr. W. R. Flowers, Mr. C. Doty, Major G. W. Arbogast, Col. C. O. C. Henning, Jr., Mr. A. Mark, Manager, News Services, and Mr. Lawler. (In background, representatives of the Singer Co. and A. Galfund, COMSAT Senior Information Officer.)

DIGISAT demonstrates satellite service capability; FCC authorizes service to begin

The first demonstration of COMSAT's proposed DIGISAT service was presented recently as part of a series of briefings in the Visitors' Center at L'Enfant Plaza. Representatives of the press, government, industry, international record carriers and INTELSAT observed three different live applications of Digital Data Satellite Service and were given details on how COMSAT proposes to provide the innovative service.

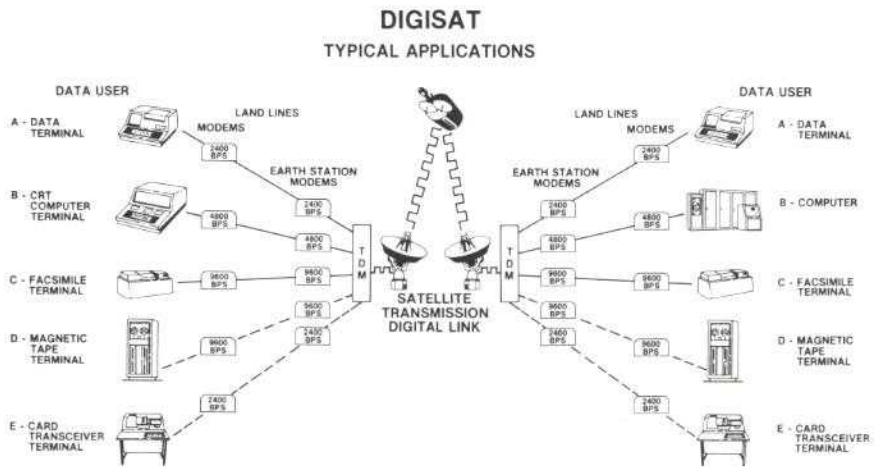
DIGISAT is designed to provide international digital circuits via satellite, especially for data users to operate at rates of 2,400, 4,800 or 9,600 bits per second. DIGISAT represents a significant economic breakthrough by using the more efficient digital transmission capabilities unique to satellite systems.

On January 15 the Federal Communications Commission authorized COMSAT to begin providing DIGISAT service between the United States mainland and Hawaii. Accordingly, COMSAT filed an appropriate tariff effective January 17, 1975

George A. Lawler, Director of the International System Division's Service Development, reviewed the background leading to the establishment of the digital data system and discussed some of its applications (see DIGISAT applications chart).

Mr. Lawler explained that COMSAT introduced the first high-speed international digital service operating at 50 kilobits per second a few years ago. This international service utilized Single Channel Per Carrier (SCPC) equipment designed and developed by COMSAT Laboratories. With this equipment at the earth stations, data speeds of 50 kilobits per second can be accommodated on satellite circuits using the equivalent of only a single voice grade satellite channel. Lawler pointed out that the same volume of data, employing conventional frequency modulation (FM) techniques, requires the equivalent of 12 voice grade channels. Fifty-kilobits-per-second data circuits are operating currently between the East Coast of the U.S. and Spain, and also between the West Coast of the U.S. and Hawaii and Australia.

Inasmuch as the number of potential users of 50-kilobits-per-second service is somewhat limited in the near future, Lawler said, COMSAT developed and is now proposing its new service—DIGISAT. Circuits operating at rates of 2,400, 4,800 and 9,600 bits per second will be multiplexed at an earth station into a conventional Time Division Multiplexer and then transmitted over one of the SCPC



channels through a satellite to a distant earth station. At this point demultiplexing takes place and the separate circuits are extended to user terminals over standard terrestrial voice channels.

The actual demonstration of DIGISAT exhibited three typical applications, each operating at a different data rate. For the 2,400-bits-per-second rate, a data entry terminal furnished by the Singer Company and located in the Visitor's Center was connected via satellite and DIGISAT terminals at the Etam, West Virginia, and the United Kingdom's Goonhilly earth stations to a similar data terminal in the United Kingdom. Information was exchanged between the terminals at 2,400 bps and presented on associated display screens.

Using the 4,800-bits-per-second rate, a Tektronix Graphics Terminal in the Visitors' Center was connected via a double-hop satellite circuit to the COMSAT Laboratories computer at Clarksburg, Md. The circuit was routed through the DIGISAT terminal at the Etam earth station to Goonhilly and return to Etam with a terrestrial extension to Clarksburg. The terminal queried the computer and responses were presented visually on its display screen.

Operating at 9,600 bps, two Electronic Associates, Inc., digital facsimile transceivers in the Visitors' Center were connected via double-hop satellite circuits using DIGISAT. The circuit connecting the two units was routed through the DIGISAT terminal at the Etam earth station to Goonhilly and return to Etam with terrestrial extensions to the Visitors' Center. Personalized souvenir certificates were included with the material sent from one transceiver to the other.

In his briefings, Lawler emphasized that for the first time data network planners will have the choice of selecting facilities that will match their requirement for bit rates of 2,400, 4,800 and 9,600 bits per second. This service will be in addition to the 50-kilobits-per-second service being provided to meet international needs of larger data users. The overall service is designed to meet the requirements of economy, quality and digital data capability on a global basis.

INTELSAT IV launch fails

The first failure in the INTELSAT IV series occurred Thursday, February 20, over the Atlantic Ocean, following the launch from Cape Canaveral, Florida. The launch, while visible for a few seconds before entering a cloud cover, appeared to proceed well, but, after about four minutes the rocket began to tumble and after seven minutes a destruct command was sent by the range safety officer.

The satellite was to have been positioned over the Indian Ocean, joining another INTELSAT IV already serving that area.

NASA officials immediately named a failure review board to analyze all available data in an effort to pinpoint the cause of the malfunction which led to the destruction of the rocket and its payload.

Schwartz to head Office of Public Information

Robert B. Schwartz, Corporate Secretary and Assistant General Counsel—Corporate Matters of COMSAT, has been named Director of COMSAT's Office of Public Information, succeeding Matthew Gordon who retired on February 28. Mr. Schwartz will continue in his position as Corporate Secretary and will have the title, Secretary and Director of Public Information.

Mr. Schwartz joined COMSAT in 1966; he became Corporate Secretary in 1969 and an assistant general counsel in 1973. Before joining COMSAT, he was an appellate attorney for the National Labor Relations Board. Mr. Schwartz is a graduate of Tufts University and Harvard Law School.

Dental Plan

(continued)

have been broken down by decay or injury to include all silver, silicate, porcelain and plastic restorations. Crowns and gold fillings are also covered if the tooth, for example, cannot be reconstructed by a filling of other material.

The Plan also covers prosthetic appliances (full dentures, partial removable or fixed bridgework) that include the replacement of natural teeth that are lost after coverage under the Plan becomes effective. If an existing appliance is more than five years old and cannot be satisfactorily repaired a replacement can be provided. Benefits are also provided for repairing damaged dentures or for adding teeth to existing dentures or rebasing an old denture.

However, it should be noted that costs covered are costs allowable for a standard prosthetic appliance and do not cover additional charges for specialized techniques. In cases in which a permanent denture replaces an immediate temporary denture, the allowance for both appliances will be limited to the maximum benefit for a permanent denture. Allowances include all adjustments within six months of installation.

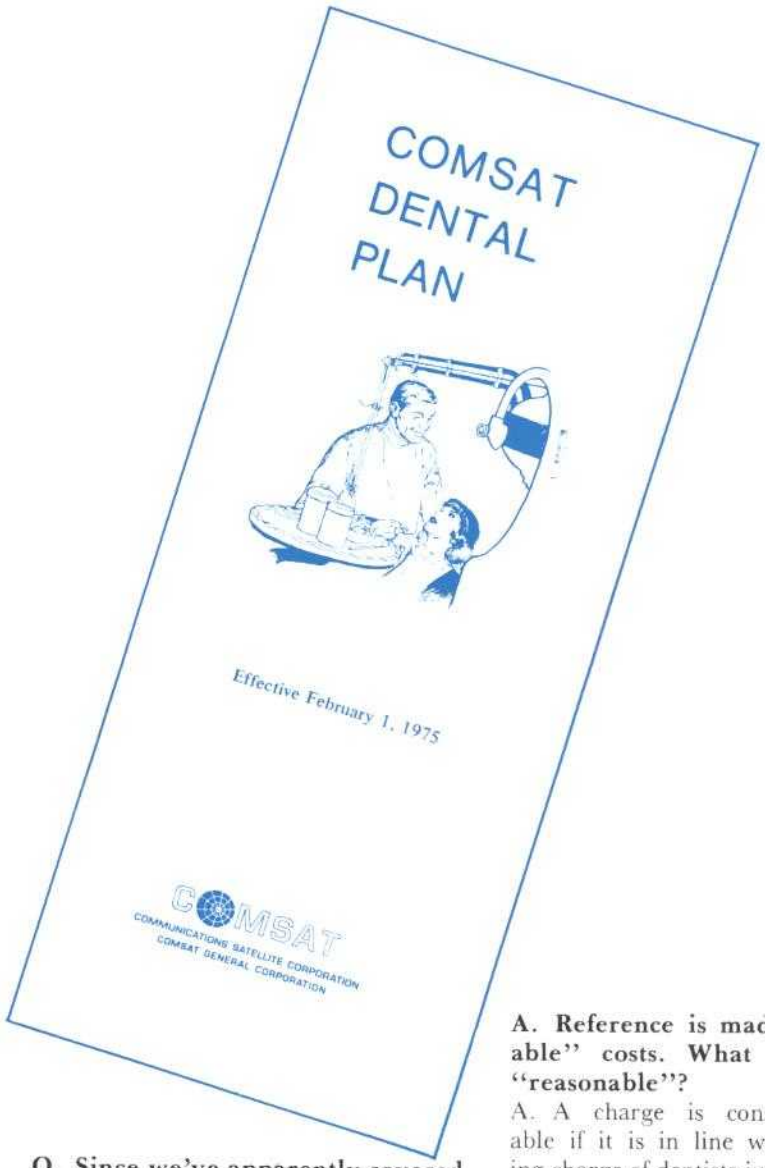
Q. Does the Plan cover orthodontic service?

A. Necessary charges made for services and supplies in connection with orthodontic treatment, other than for extractions and space maintainers, to correct malposed teeth with respect to covered individuals, where treatment is begun after the effective date of coverage, are included.

Employees on the payroll before Feb. 1, 1975, and their dependents covered as of that date, are eligible for services rendered after Feb. 1. Extractions incidental to orthodontic services are paid under covered dental charges.

Q. Have I overlooked any service I'm entitled to under the Plan?

A. Well, it should be pointed out that there are clauses relevant to the treatment of gum diseases and root canal therapy which should not be overlooked by the employee.



Q. Since we've apparently covered most items the Plan will help pay for, what expenses are not covered?

A. Cosmetic treatment; charges for appliances to increase vertical dimension or occlusion; dental services under any company-sponsored medical benefit program; education or training and supplies used for personal oral hygiene; occupational injury, war conditions, or services in a U.S. Government hospital; and facings in back of the second bicuspid on crowns or false teeth.

This should not be considered an exclusion but it should be taken into consideration that, occasionally, a patient may select a more expensive procedure rather than a suitable alternate procedure, and in such a case, Plan benefits will be paid on the basis of a reasonable procedure consistent with good dental care.

A. Reference is made to "reasonable" costs. What is meant by "reasonable"?

A. A charge is considered reasonable if it is in line with the prevailing charge of dentists in your area.

Q. What happens if I leave COMSAT?

A. When your employment with COMSAT is terminated the Plan is terminated.

Q. Where can I get the necessary forms required to submit for service?

A. Dental claim forms are available in the Personnel Office or, if you are located elsewhere, from the local office or station administrator. You must take a claim form to your dentist on the first visit. If treatment is expected to exceed $100, the claim form is designed to allow you to determine in advance the actual payment the Plan provides. This reduces any possibility of misunderstanding and will allow you to make suitable arrangements with your dentist for payment of your portion of the charges.

COMSAT General's labors bear fruit: Satellite TV comes to Saudi Arabia

The September-October issue of the COMSAT NEWS *carried a feature on the construction of earth stations in Saudi Arabia by* COMSAT GENERAL'S *Technical Services Division. The Weekly Newsletter published by the Ministry of Information of Saudi Arabia recently printed a story on the inauguration of the first live television transmitted by satellites. Following are extracts reprinted from the article as it appeared in the Newsletter.* EDITOR'S NOTE

Hajj Procession to be Transmitted Live Via Satellite

Jeddah—The Ministry of Information yesterday morning celebrated the inauguration of the first live television transmission via satellites at a special ceremony attended by the Minister of Information, Sheikh Ibrahim Al-Angari and the Minister of Communications, Sheikh Muhammad Omar Tawfik. The live TV transmission took place through the temporary ground station for communications via satellite which was supplied and installed by the U.S. firm COMSAT for the reception and transmission of television programmes between Saudi Arabia and the outside world.

The ceremony was started with a visit by the Ministers of Information and Communications and their top aides to the ground station in Jeddah. The ceremony was also attended by the Jordanian Ambassador to the Kingdom, Sheikh Muhammad Amin Al-Shangiti, and journalists. Then they moved to the Jeddah Television Station to witness the first direct transmission from the Kingdom to Jordan.

The transmission was started with a statement by the Minister of Communications addressed to the Jordanian people in which he emphasized the importance of this step for boosting fraternal ties between the two peoples and helping transmit the Hajj procession and rituals to the outside world in Europe and America via the Jordanian ground station.

The Minister of Information followed with a speech in which he conveyed the greetings of His Majesty King Faisal, the pioneer of Islamic solidarity and leader of Saudi Arabia, and those of the Saudi Arabian people to the Jordanian people.

This was followed by shots showing views of the Holy Mosque, the arrival of His Majesty the King at Jeddah airport to supervise preparations for the Hajj, and the reception of the flux of pilgrims flocking to the Kingdom, which has mobilized its machinery for their comfort.

The contact between the ground stations was effected through the Indian and Atlantic oceans satellites via the link-up Fucino station in Italy.

With the commissioning of this ground station into service, the Saudi Arabian Television will be able to receive and transmit important events and special programmes from and to any country in the world equipped with a ground station.

Saudi television will start as of today to benefit from the daily newsreel transmitted from France in its evening newscast.

Nilson appointed European Office Director

Dr. Mats C. Nilson, acting director of the European Office since mid-1974, has been appointed Director, according to an announcement by Richard R. Colino, Assistant Vice President for International Relations and Corporate Planning.

Dr. Nilson has been with the Corporation in Geneva since 1970. Prior to joining COMSAT, he was a staff scientist with the Convair Division of General Dynamics Corporation. The new Director holds a Ph.D. from Innsbruck University, Austria, a Master's Degree from Stanford University and a Bachelor's Degree from the University of Minnesota.

Former M.I.T. professor and author becomes Asst. VP for R & E's Advanced Systems

Dr. Harry L. Van Trees, formerly Chief Scientist and Associate Director, Technology, Defense Communications Agency, has been appointed Assistant Vice President for Advanced Systems, according to an announcement by John V. Harrington, Vice President, Research and Engineering.

As Assistant Vice President for Advanced Systems, Dr. Van Trees will have the responsibility within Research and Engineering for systems analysis and planning activities. Under this arrangement the present Plans and Programs Office headed by L.B. Norman and the Systems Studies Division headed by H.J. Weiss will both report to Dr. Van Trees. The consolidation of these systems analysis activities within Research and Engineering is a reflection of the growing volume and continuing importance of such studies and the corresponding need to strengthen the organizational arrangements for handling them.

Dr. Van Trees comes to COMSAT from a three-year term as Chief Scientist and Associate Director, Technology, for the Defense Communications Agency. During that period he was on leave as Professor of Electrical Engineering from M.I.T. where he had been a faculty member and researcher since 1961. He is the author of three graduate texts on Detection, Estimation, and Modulation Theory and many journal articles dealing with various aspects of electrical communications theory and is a well recognized authority in this field. Dr. Van Trees is a 1952 graduate of the U.S. Military Academy and received his Sc.D. from M.I.T. in 1961.

INTELSAT R & D Program for 1975 approved by Board of Governors: *Member countries climb to 89*

A Research and Development Program with a budget in excess of five million dollars was approved at the thirteenth meeting of the Board of Governors held in Bangkok, Thailand, with 21 Governors, representing 61 Signatories, in Attendance.

The Board took note that, with the accessions of Bolivia and Oman, INTELSAT had increased its membership to 89 countries.

The following actions were among those taken by the Board:

Technical and Operational Matters

- Approved the 1975 INTELSAT Research and Development Program as recommended by the Advisory Committee on Technical Matters. This program includes new budget authorizations of $2,848,000 for in-house expenditures and $2,255,000 for contract commitments, for a total budget of $5,103,000.
- Approved an agreement with Malaysia for lease of a transponder on a preemptible basis to meet domestic service requirements under terms and conditions which had been approved by the Board at its ninth meeting. The Malaysian domestic services will be considered on the same basis as international services, pursuant to Article III (b) (i) of the Agreement since the service will be "between areas separated by the high seas."
- Approved terms and conditions for the preemptible lease to Chile of a transponder to meet domestic services from the third quarter of 1976.
- Authorized the Secretary General, using the procedures for notification to the International Frequency Registration Board approved by the ICSC, to request the FCC to submit to the IFRB the required information on INTELSAT IV and IV-A satellites, and to coordinate with other administrations as necessary.
- Decided that the agreement with Algeria for preemptible lease of a transponder for domestic telecommunications should be amended so as to commence on March 1, 1975 instead of January 1, 1975.
- Authorized the dual polarization measurement program as recommended by the Advisory Committee on Technical Matters. The Management Services Contractor will submit regular progress reports to the Advisory Committee, which will, in turn, report to the Board as key stages are reached during the course of the program.
- Approved the following nonstandard earth stations for access to the INTELSAT space segment, with conditions as noted:

a. Four Norwegian stations for access to the space segment under the half transponder lease subject to Norway's providing specific information on sidelobe deviation, out-of-band emissions, and verification of the stated performance characteristics.

b. The Wattayah, Oman, station for access to provide telephony, record and television services until replaced by a standard station, subject to rate adjustment factor of 2.5 times the normal rate for telephony and record services, normal rates with no increase in satellite power for television, and verification of the stated performance characteristics.

c. A modified application for the Jeddah, Saudi Arabia, station, subject to verification of the stated performance characteristics.

d. Continued access without charge to the U.S. unattended earth terminal for tests and demonstrations.

e. The Cairns, Australia, station for access until June 1975 in a receive-only mode without charge for the conduct of experiments.

- Decided that its previous conditional approval of the fourteen Algerian stations should be subject to the receipt of additional information on the transmit sidelobe and out-of-band emissions, as recommended by the Advisory Committee on Technical Matters. Similarly, the Danish Signatory is to provide additional information on the Thule, Greenland, station.

Financial and Legal Matters

- Decided, at the request of the U.S. Signatory, that COMSAT GENERAL could make use of certain INTELSAT computer programs in connection with launches of its domestic and maritime satellites at a royalty payment to be determined but not to exceed $40,000 per launch.
- Requested the Advisory Committee on Finance to review the pres-

Mr. Sribhumi Sukhanetr (second from left), Deputy Minister of Communications of Thailand, welcomes the Board of Governors to Bangkok. Seated at the table with Mr. Sukhanetr are, left to right: W. G. Geddes, Vice Chairman of the Board; Mr. Sukhanetr; J. L. Algrett, Chairman; and Chao Thongma, Acting Director General, Post and Telegraph Department, Thailand.

ent SPADE charge of 15¢ per minute of holding time, as well as Signatories' replies to the Questionnaire on SPADE, and the need for a back-up central data recorder.

Administrative matters

- Began preparation of the reports to the Third Meeting of Signatories in April, and decided that although a full report will be made on future programs and their financial implications, it is not necessary to request an increase in the capital ceiling at this time.
- Approved the request by the U.S. Signatory that the current agreement with the Smithsonian Institution for display of INTELSAT I, II, and III satellites at the National Air and Space museum be extended to cover the period 1976 to 1981. The Smithsonian will keep all exhibits for the first two years after which any INTELSAT Signatory may request loan of one of the exhibits.
- Adopted the terms of reference for the Advisory Committees on Planning and Technical Matters which had been provisionally approved at the Fifth Board Meeting and requested their officers to consult as required.
- Approved one-year assignments for Mr. Inoue, a nominee of the Japanese Signatory, and Mr. Neyret, a nominee of the French Signatory, to work on the Management Services Contractor laboratories staff; and of Mr. Costelloe, a nominee of the Irish Signatory, and Mr. Tsuji, a nominee of the Japanese Signatory, to work with the Headquarters staff.

The preceding report was prepared by Ellen Hoff of The International Affairs Division.

Exchanging pleasantries during a recess in the meetings are, left to right: Philippe Binet, Alternate Governor, France; Richard R. Colino, U.S. Governor, Arne Raaberg, Governor, Nordic Group; Sribhumi Sukhanetr, Deputy Minister of Communications, Thailand; J. L. Alegrett, Chairman of the Board and Governor for Venezuela/Colombia/Chile; and Chao Thongma, acting Director General, Post and Telegraph Department, Thailand.

COMSAT reports year-end/fourth quarter earnings

COMSAT has reported a consolidated net income of $44,918,000 for 1974, equal to $4.49 per share, compared with $36,299,000 or $3.63 per share for 1973.

In releasing its 1974 results the Corporation pointed out, as it had last year in reporting 1973 earnings, that its rates for provision of services throughout the INTELSAT satellite system are being investigated by the Federal Communications Commission. Since a decision as to whether the rates are or have been excessive has not yet been issued, reported results are subject to the effect, if any, of the outcome of the investigation.

Net operating income for 1974 totaled $36,348,000 on revenues of $133,470,000, compared with $29,424,000 on revenues of $119,291,000 for 1973. The higher revenues accounted for all of the increase in net operating income and were primarily related to growth in the lease of full-time half-circuits by the Corporation's carrier customers. Excluding from both year's figures that part of U.S. mainland-Hawaii service now being provided on a bulk basis at a fixed monthly charge, leased half-circuits totaled 3,509 at December 31, 1974, compared with 2,933 at the end of 1973.

Other income totaled $8,570,000 in 1974 compared with $6,875,000 in 1973. Recording of larger amounts as allowance for funds used during construction accounted for the higher 1974 income and was related to expenditures for global system satellite programs.

Consolidated net income for the fourth quarter of 1974 totaled $12,317,000, or $1.23 per share, compared with $11,244,000, or $1.12 per share, for the comparable period of 1973. Net operating income totaled $9,968,000 on revenues of $35,928,000 compared with $9,180,000 on revenues of $32,642,000 in the similar 1973 period. The major portion of the increase in operating revenues was attributable to gains in the number of full-time half-circuits leased to carriers.

Operating expenses (excluding income taxes) amounted to $15,434,000 for the quarter, compared with $13,971,000 in the previous year, with the difference being largely attributable to favorable year-end expense accrual adjustments during the 1973 period. Other income, net of income taxes, increased from $2,064,000 in the 1973 quarter to $2,348,000 in the 1974 period, with higher allowance for funds used during construction more than accounting for the improvement.

Board of Directors declares quarterly dividend

The COMSAT Board of Directors has declared a quarterly dividend at the previously established rate of 25 cents per share. The dividend, COMSAT's 18th consecutive quarterly dividend, is payable on March 10, 1975, to all holders of record of the Corporation's Common Stock as of the close of business on February 7, 1975.

INTELSAT contract awards

To **TRW Inc.** of Redondo Beach, California, a 12-month, $160,000 contract to develop a nickel-hydrogen battery package suitable for use in a communications spacecraft.

To **Hughes Aircraft Company** of El Segundo, California, a 13-month, $131,600 contract for a phased array antenna study for communications satellite applications.

To **TELDIX Gmbh** of Heidelberg, Federal Republic of Germany, an 18-month, $94,000 contract to improve the reliability of a bearing and lubricant system.

To **Fairchild Space and Electronics** of Germantown, Maryland, a 14-month, $119,234 contract for development of a counter-rotating louver.

To **AEG-Telefunken,** Federal Republic of Germany, a 14-month, $55,273 contract for a Cathode Activity Criteria Study.

To **Australian Post Office Research Laboratories (APO),** Melbourne, Australia, a 15-month, $55,129 contract for further investigation into problems encountered in implementation of the echo cancellation technique.

Former Chairman and Chief Executive Officer dies

Maj. Gen. James McCormack, COMSAT Chairman and Chief Executive Officer from 1965 until 1970, died at his winter home in Hilton Head, S.C., Friday, January 3, at the age of 64.

A Rhodes Scholar, a graduate of the U.S. Military Academy, and a former deputy chief of staff in the Air Force, he retained his membership on the Board of Directors until April 1973.

At the time of his retirement from the Air Force in 1955, General McCormack was deputy chief of staff for research and development. From 1947 to 1951 he was director of military applications for the Atomic Energy Commission.

In 1956 he organized the Institute for Defense Analyses, a consortium of 10 universities supporting the Defense Department and other federal agencies in science and technology, and for two years was president of the institute.

Later he helped organize Educational Services, Inc. which played an important role in the revision of school curricula, and served as a consultant to the White House, State and Defense Departments, the National Aeronautics and Space Administration and the Civil Service Commission.

General McCormack also served on the Rockefeller special study group on American policy, the Gaither panel on national defense and the Draper committee on foreign military aid.

He also had served on the board of directors of Eastern Airlines, Bulova Watch Co., the Federal Reserve Bank of Boston, and the Mitre Corp.

Born in Chatham, La., he was a 1932 graduate of the U.S. Military Academy. A Rhodes scholar at Oxford University, he also received a master's degree in engineering from MIT.

During World War II he was an intelligence and logistics officer on the staff of Gen. Omar Bradley, commander of the 12th Army group. That duty included serving as a colonel on

the intelligence staff that planned the Normandy invasion.

His military decorations include the Distinguished Service Medal, Legion of Merit and Bronze Star, and awards from France and Great Britain.

He became vice president of MIT in 1957. He also supervised the school's two largest research programs—Lincoln Laboratory and the Instrumentation Laboratory. While living in Massachusetts he was chairman of the Massachusetts Bay Transportation Authority and was a president of the Greater Boston Chamber of Commerce.

In 1947 General McCormack was appointed by President Eisenhower to succeed the late Charles A. Lindbergh as a member on the board of visitors of the Air Force Academy.

He leaves his wife, the former Eleanor Morrow; a son James R., of Norfolk, Va.; a daughter, Mrs. Ann M. Stanton of Ft. Campbell, Ky.; and seven grandchildren.

Services were held in the Ft. Myer Chapel, with burial in Arlington Cemetery. The family suggests that expressions of sympathy be in the form of contributions to the American Heart Association or the American Cancer Society.

COMSAT General gives technical aid to U.S. TV News Firm

COMSAT GENERAL Corporation is providing technical consulting services to Television News, Inc. (TVN), which plans a nationwide network of earth stations for domestic distribution of television programming.

TVN, an independent news service for television stations, became the first U.S. TV broadcast entity to announce it will use satellites for programming on a daily basis in this country. Company executives told a recent press conference at the Plaza Hotel in New York City they are prepared to spend $10 to $12 million to switch from terrestrial to satellite distribution.

TVN presently transmits regional, national and international news stories one hour a day to more than 35 TV stations in the United States. The company's goal is to build earth stations close to the premises of its subscriber television station affiliates, and transmit its programming via satellite at costs lower than is now possible by conventional means.

COMSAT GENERAL's Technical Services Division (TSD) has contracted with TVN to provide technical assistance relating to the proposed network of earth stations.

TVN filmed an interview with Donald R. Owen, Director of TSD, as part of a television feed to its subscribers in conjunction with its New York City press briefing. Messrs. Owen and Robert Drill, Manager TV Requirements in the Commercial Development Division of COMSAT GENERAL, participated in the TVN press conference.

New Standard Practice Instruction Manual discussed

Jim Lawson, Supervisor, Administrative Procedures, discusses COMSAT's first official binder incorporating company Standard Practice Instructions (SPI) with COMSAT's Elaine Prech. The new manual, issued in the last quarter of 1974 to selected management personnel, is designed to contain all administrative policies and procedures of an inter-office nature. It will also include existing inter-office administrative manuals such as the Personnel Policies and Procedures.

Briskman advanced to Fellow by IEEE

The Board of Directors of the Institute of Electrical and Electronic Engineers (IEEE) has announced the promotion of a number of Senior Members to the grade of Fellow, the highest membership grade in IEEE. Among those advanced was Robert D. Briskman, Program Manager, Domestic Systems, COMSAT GENERAL.

The grade of Fellow is conferred only on persons of outstanding and extraordinary qualifications and experience in the fields of electrical engineering, electronics, radio, allied branches of engineering or the related arts and sciences. Briskman was selected for his contributions to the development of communications satellite systems.

IEEE Bylaws limit the number eligible for advancement to the Fellow grade in any one year to a total equal to one two-hundreths of the number of Senior Members enrolled as of the last day of the preceding year. The grade may be attained by invitation only.

Briskman joined COMSAT in 1964. Previously, he had worked with IBM, the Army Security Agency and NASA. He has a BSE Degree from Princeton University and an MSE Degree in Electrical Engineering from the University of Maryland.

Back issues of COMSAT Technical Review needed

Due to the continuing demand for copies of previous issues of the COMSAT Technical Review from scientists and engineers throughout the world, the supply of CTR's for the years 1971 and 1972 has been exhausted with few of the 1973 issues remaining.

The Public Information Office is asking employees to return those copies for which they do not have a definite need so that these requests might be filled. CTR copies should be sent to Ed Bolen of the Information Office.

Labs' First Aid Team

trained and capable

BY BETTY MOWEN, R.N.

PHOTOS BY BILL MEGNA

With the First Aid Team looking on, Nurse Betty Mowen runs an EKG (Electrocardiograph) on Steve Beall. In addition to Nurse Mowen and Beall the other members of the team include, from left to right, Brent Bell, Marion Bennett, George Robertson, Ken Pease, C. T. Bowman and Bob Barber.

Some time ago, an employee of the COMSAT Labs dropped an ignited match to avoid burning her hand. It fell on her dress which caught fire.

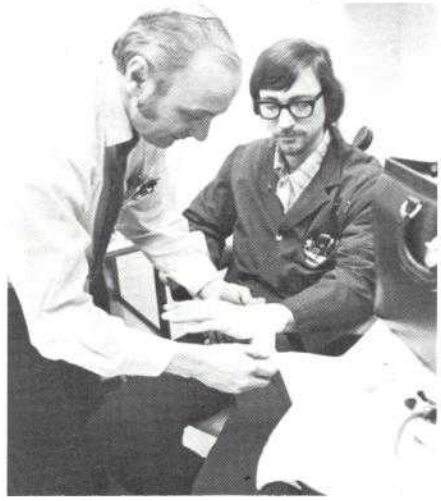
Hearing her scream for help, another employee rushed to her aid, pushed her to the floor and smothered the flames with his own body.

Within a few minutes, Nurse Betty Mowen was on the scene and, with the assistance of some of the members of the First Aid Team, got her to the Medical Unit and administered first aid. Fortunately for the employee, the reaction of the specially trained First Aid Team and her rescuer—who had previous first aid training—left her without serious injury or permanent scars other than the terrifying experience on that day.

More recently, Nurse Mowen, receiving an urgent call to assist at the scene of a serious accident involving a Labs employee, had a team assembled at the accident site within three to five minutes and the victim on the way to the hospital shortly afterward. A call to Personnel resulted in alerting members of the team who arrived almost on the heels of Nurse Mowen. A letter of commendation from the employee's supervisor attests to the speed and skill with which the Labs' team performs.

These are only two of the many incidents in which the COMSAT Labs First Aid Team, organized in early 1970, has proven its value to COMSAT employees. The team presently consists of 13 volunteers who perform in a manner similar to volunteer firefighters, assisting Nurse Mowen in emergencies and remaining on call during her absence. When she is required to leave the facility during normal working hours, the nurse designates a team member to stand by during her absence. The name of the "Duty Stand-by" is given to Personnel which contacts him or her by phone or on the emergency receiver carried for that purpose.

The 26-hour training course for the Emergency First Aid Team consists of eight hours of multi-media first aid; 10 hours of training geared to the particular needs of COMSAT Labs by industrial physician Dr. Michael Healy and Betty Mowen,



C. T. Bowman demonstrates the proper application of a figure eight bandage on the hand and wrist of Bob Barber.

R.N.; and eight hours of Cardiopulmonary Resuscitation in cooperation with the Montgomery County Heart Association. In-service training, intended to constantly update and improve the quality of emergency treatment at COMSAT Labs, is held periodically throughout the year. Many members of the team had also had first aid or medical training and experience before coming to COMSAT Labs.

Present members of the team are Peter D. Ackerman, Robert G. Barber, Steven P. Beall, Jack B. Bell, Marion M. Bennett, Clyde T. Bowman, William R. Kerns, Betty L. Linthicum, Kenneth L. Pease, David G. Reiser, George A. Robertson, Blaine T. Shatzer, and William D. Windell.

Marion Bennett assists Nurse Mowen in checking the blood pressure of team member Ken Pease.

The Team

Dr. Michael Healy

Steven P. Beall

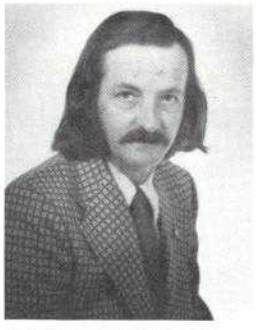
Kenneth L. Pease

William R. Kerns

Betty H. Mowen, R.N.

Robert G. Barber

Betty L. Linthicum



William D. Windell

Clyde T. Bowman

Marion M. Bennett

Blaine T. Shatzer

David G. Reiser

Jack B. Bell

Peter D. Ackerman

George A. Robertson

COMSAT awarded trophy for film documentary

The Union of Italian Aerospace Journalists awarded COMSAT a trophy and citation for its documentary film, "Ten Years to Tomorrow," at the First International Review of Cinema and TV Film on Flight held recently in Milan, Italy.

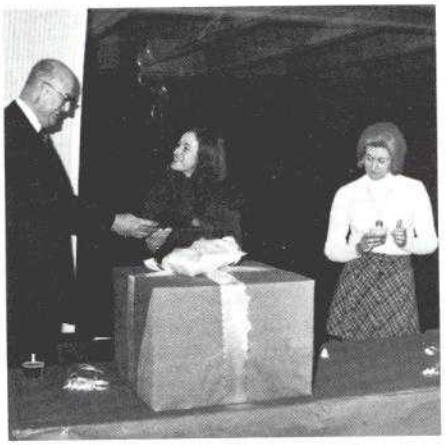
The award winning documentary, produced by the Public Information Office, and designed to give the viewer a better understanding of the vital role played by satellite communications in a developing country and in the world, was released in mid-1973 and has been on the television circuit for more than a year. It has been shown on more than 500 television stations in cities throughout the 50 states to an estimated viewing audience of more than 14 million people.

Other audiences for "Ten Years to Tomorrow" have included colleges, universities, secondary schools, civic and fraternal groups, business firms, trade associations, historical and educational organizations, foundations and federal and state government agencies. The COMSAT documentary was selected by the United States Information Agency for translation into foreign languages for showing to overseas audiences.

The film, about six months in the making, was shot on locations at the Etam, West Virginia, and the Quito, Equador, earth stations. Filming also took place at COMSAT Headquarters at L'Enfant Plaza and the Labs. "Ten Years To Tomorrow" is available for loan to COMSAT employees for showing at luncheons or other meetings.

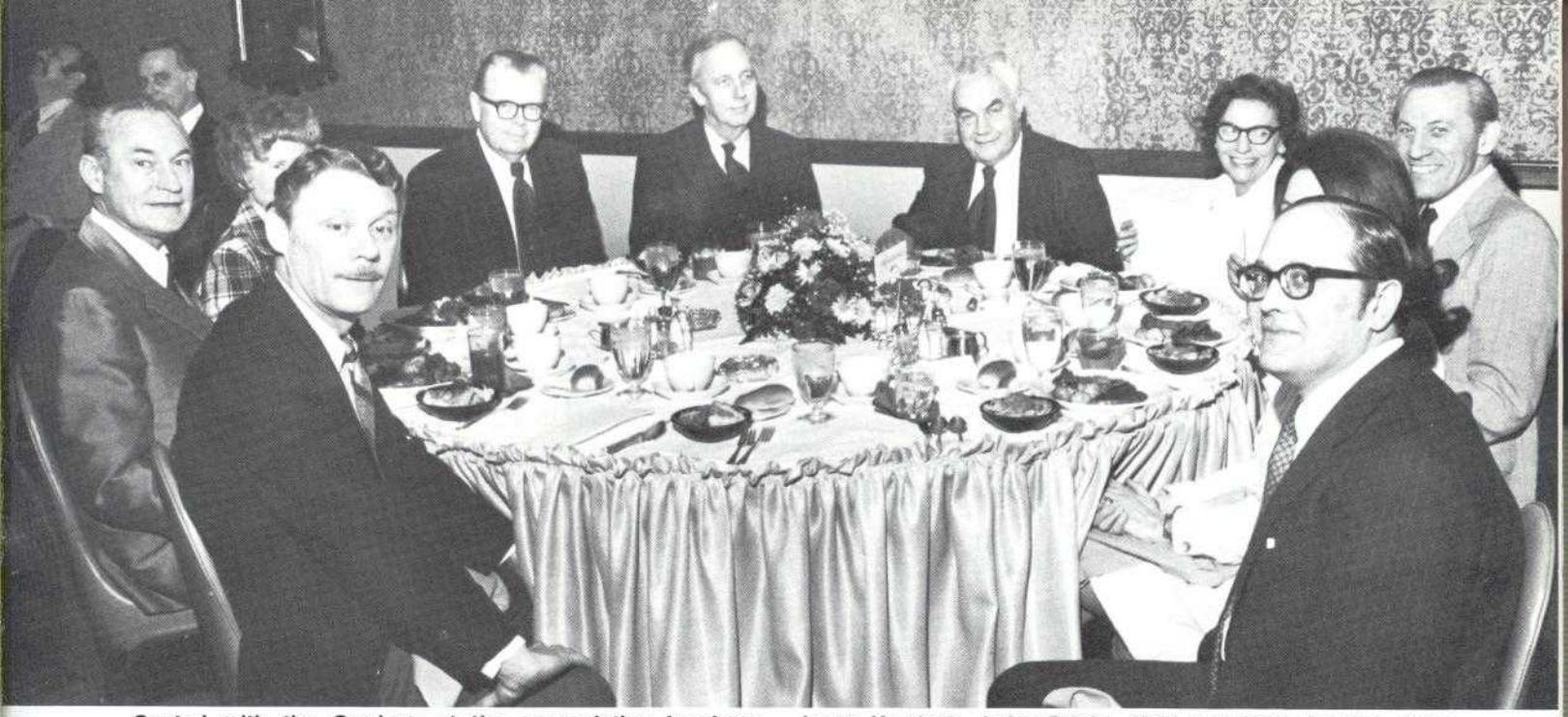
Tish Fonda, Information Office Editorial Assistant, displays the citation and trophy awarded COMSAT by the Union of Italian Aerospace Journalists for its film documentary, "Ten Years to Tomorrow".

Bridal shower for COMSAT General's Kathleen Wilson



Finance's Carl Reber presents Miss Wilson with one of many gifts. Elaine Prech (right) assisted in organizing the shower.

More than 100 fellow employees of Kathleen Wilson honored her recently with a bridal shower. Miss Wilson, secretary to COMSAT General's Financial Vice President Joseph H. O'Connor, married Mr. Brendan Johnson in January in Ireland.



Seated with the Gordons at the appreciation luncheon held at the Bolling Air Force Base Officers Club are, left to right, Hale Montgomery, Steve Smoke, Ruth O'Donnell, Larry Hastings, Luke Battle, Matt and Toni Gordon, Allan Galfund, Juanita Campitelli (partially hidden) and Bob Schwartz.

Matt Gordon leaves as COMSAT Officer;

appreciation for services expressed by INTELSAT, COMSAT Board members, staff and media

At the conclusion of the Fourteenth Meeting of the Board of Governors, the Chairman of the Board, Mr. Jose L. Alegrett of Venezuela, expressed the gratitude and recognition of INTELSAT for the work of Mr. Matthew Gordon of COMSAT. Among other things, the Board observed Mr. Gordon had been one of the gentlemen in the forefront of the emergence of global satellite communications and, as COMSAT's head of Information, had participated and contributed to the establishment and recognition of INTELSAT around the world. He had conducted the public information program on behalf of INTELSAT from the very beginning of the establishment of the INTELSAT system and many people associated with INTELSAT can remember the world-wide press and news coverage which began with the Early Bird launch.

Speaking on behalf of the Board, Mr. Alegrett expressed a deep gratitude and appreciation for Mr. Gordon's tireless efforts and meaningful contributions to the success of INTELSAT and wished him well in the future.

In the Spring of 1963 there was a small group in the Davies Mansion called Tregaron in Northwest Washington, D. C. A nameplate on the outside of the building said: "Communications Satellite Corporation".

This was COMSAT, created by Act of Congress in August 1962, after sustained and sometimes acrimonious debate.

Matthew Gordon
Assistant Vice President
for Public Information

In a room directly facing the door of the high, chandeliered lobby was the office of Leo D. Welch, Chairman. Upstairs, reached by curving staircase, was the office of Dr. Joseph V. Charyk, in a large bedroom. Outside this room was Ruth O'Donnell, Dr. Charyk's secretary. The corporate Secretary, David Melamed, was downstairs, to the left as you entered.

The Board of Directors met in a room used in the movie "Advise and Consent" based on Allen Drury's novel. Pat Waring and Suzanne King answered phones and queries in the lobby.

Into this group on May 20, 1963, came Matthew Gordon as the then Director of Information. On February 28, 1975, Matt Gordon "retired" as Assistant Vice-President for Public Information. In between these two dates was almost the entire history of COMSAT.

In 1963 there was just a bank line of credit for COMSAT. There was no program. There were no international arrangements. There was no clear

Former Vice President and presently Senator Hubert H. Humphrey of Minnesota makes some remarks after the successful launching of Early Bird in April 1965. Interested observers include, left to right, COMSAT's first Chairman and Chief Executive Officer Leo D. Welch, Matt Gordon, and COMSAT President Joseph V. Charyk.

idea of what kind of satellite system to develop. The synchronous satellite was regarded by some as the "ultimate," not the first, for a commercial system.

From the "kitchen" of Tregaron, to 1900 L Street, to L'Enfant Plaza and COMSAT Laboratories has been a twisting road, with some excitement, some surprises, some disappointments and, in all, an historic contribution to world communications.

Every major news event of this period was handled by Matt Gordon, first with only the assistance of Pat Waring and then Juanita Cellini and later with the developing COMSAT information staff. Matt Gordon was also in direct supervisory charge of publications, visuals, reports, special events and all aspects of COMSAT information. He has had the closest relationship with the news media, members of government and congressional staffs and the Federal Communications Commission Staff, etc. When the first experimental/operational synchronous satellite was launched it was Matt Gordon, (in reply to a query by a friend on the Associated Press) who gave it the name "Early Bird" which remained and later was to be listed also as INTELSAT I.

The roster of events in the span from Tregaron to 1900 L Street, N. W., to L'Enfant Plaza included launches, dedications, special events, international conferences, regulatory decisions, listing on the N. Y. Stock Exchange—many, many events and many, many, intricacies unique to COMSAT. It is a twelve-year history composed of many things and the story of a small group who have been at the beginning.

Before coming to COMSAT Matt Gordon spent more than fifteen years in charge of press services for the United Nations Secretariat in New York, handling the political, economic and technical news of that organization, including the two world conferences on peaceful uses of atomic energy in Geneva, Switzerland. After leaving the UN Matt was in Rockefeller Plaza, N. Y., as a business consultant for financial relationships of technically oriented companies.

Previous to his UN service Matt was Chief of the Foreign News Bureau of the Domestic Branch of the U. S. Office of War Information, where, among other things, his job was to counter enemy propaganda from abroad and to help organize and transmit the news for the Allied invasion of Western Europe.

Before that Matt was News Editor of the Columbia Broadcasting System in New York; a news editor of the Press-Radio Bureau of the Publishers National Radio Committee; Assistant Editor of *Pathfinder* (news magazine) in Washington, D. C., and a reporter at the *N. Y. World-Telegram* and *N. Y. American*.

He is a graduate of Columbia University and of the Columbia School of Journalism, where he was one of the fiftieth anniversary medalists as one of the outstanding alumni of that school, and attended the Graduate School of Political Science at Columbia.

In recent years Matt has written on varied subjects for newspapers and other publications. He is the author of *News Is A Weapon* (published by Alfred A. Knopf) which had an introduction by Elmer Davis, famous broadcaster and author and Director of the OWI.

A notable collection of rare books and art is one of his other activities, including Americana and space-related material.

As Matthew Gordon leaves COMSAT for other orbits, whether stationary or otherwise, he goes with our deep gratitude for his dedication to the task of building public support and understanding for our program. May his future activities be as successful as his years with us. We wish him all the best.

Dr. Joseph V. Charyk
President, COMSAT

". . . to commend you on the service you have rendered COMSAT over all these years. Goodness knows, nobody has worked harder at his job than you have, and the best wishes of all of us go with you."

Joseph H. McConnell
Chairman of the Board

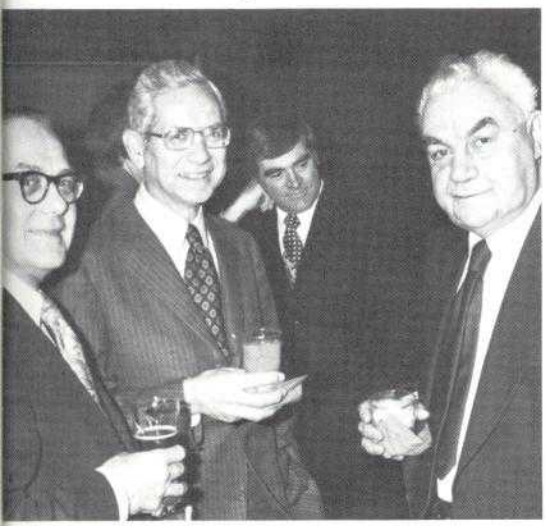
Matt Gordon receives a citation from Allan Galfund on behalf of The Information Office staff for his service as "a combat PIO in the corporate jungle" from 1963 to 1975.

Matt and Toni.

Left to right, Fran Kline, Winnie Hall, Matt, June Burton and Toni Loomis.

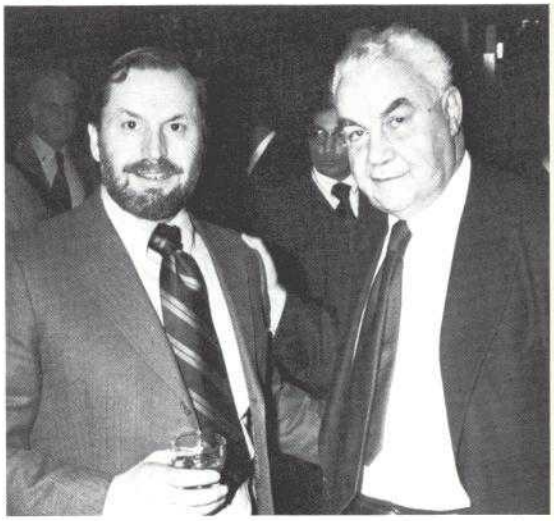
With Luke Battle, Master of Ceremonies for the appreciation luncheon, looking on, Larry Hastings hands a shopping bag to Matt to take home his gifts.

John Thaler, left, Sidney Metzger and Don Wagner with Matt.



Don Greer expresses "best wishes" to the Gordons.

Matt with Burt Edelson, Labs Director.



Although he "retired" as an officer of COMSAT Matt Gordon made it clear he did not intend to retire, as such. In the immediate future he will do writing projects and he is examining a number of proposals in diverse fields.

That was the theme of a "nonretirement appreciation" luncheon sponsored by the COMSAT information staff for twelve years of "honorable and dedicated service." The luncheon "to honor Matt and thank him for his friendliness and many contributions of time and effort for all of us," took place on February 14 (Valentine's Day) at the Bolling Air Force Base Officers Club and was at total capacity.

One of the rewards of my service on the COMSAT Board was to come to know and enjoy the benefits of the help you always gladly provided.

Philip W. Buchen
Counsel to the President
The White House
Former Board Member

Certainly you have given to COMSAT an image of strength and vitality far beyond what another public relations expert could accomplish. You have been an invaluable asset since those exciting days when we launched Early Bird.

George L. Killion
Board Member and Incorporator

For the first time in the known history of that club the sign read "Non Retirement Luncheon."

Senior Vice-President Luke Battle led off with a witty and amusing talk, Al Galfund, Larry Hastings, Steve Smoke and Hale Montgomery followed. There was a "press release" for "launching" Matt. There was a poem written for the occasion by Jerry Breslow. There were letters of appreciation by members of the news media, with one newsman suggesting that Matt be a lecturer at universities, another that he help President Ford. In his reply speech Matt said that in spite of the lightheartedness of the event, there was an undercurrent of sentiment. He pointed out attendees at the luncheon, John Johnson, President of COMSAT GENERAL, who came to COMSAT at Tregaron, Ruth O'Donnell, Marty Votaw, Lou Meyer, Don Greer, Jim Potts. In with the Tregaron originals were Sidney Metzger and Lou Early.

Matt also pointed out that he had assistance not only from the COMSAT information staff but from Juanita Cellini (now Mrs. Campitelli), Eleanor Ogburn (Mrs. Eleanor Alberstadt) and Sue Lauritzen (who pinch hit as secretary from her exempt information post). Mrs. Antonia Gordon, a teacher in the D. C. secondary school system, was present with Matt as she has always been at important occasions in his career.

Of course you remember our initial inspection at Tregaron—bare, empty, with fading memories of grandeur. Our visions of COMSAT's future exceeded the glories of Tregaron and I'm delighted that you stayed long enough to play a vital role in making the corporation an international institution.

Leonard H. Marks
Original Board Member
and former Director, USIA

The news media widely carried the story of Matt Gordon's departure. The more prominent accounts included the Associated Press, Reuters, the Washington Star, Telecommunications Reports, Broadcasting Magazine and various other magazines and trade publications. Letters came in from the media, COMSAT Board members and COMSAT staff. In addition to those quoted, others received at publication close were from Rudolph A. Peterson, Gordon Edwards, General E. R. Quesada, the Newmyer Associates, who recalled the frantic days of 1962 and 1963. James E. Dingman, former Board member and Executive Vice President of A.T.T., wrote, "You have been where the action was. I am very sorry you are leaving the COMSAT tent but you will be heard from often or strongly or both."

Luke Battle told the COMSAT information staff that "Matt Gordon is irreplaceable."

And George Lawler, who has been a feature at many COMSAT functions, said "it's the end of an era—the end of an era."

Matt Gordon performed as Master of Ceremonies at the Paumalu, Hawaii, Earth Station ground-breaking ceremony in December 1965. Seated on the platform, left to right, are the late COMSAT Chairman and Chief Executive Officer James McCormack, Congresswoman Patsy Mink and Senator Daniel Inoyue of Hawaii, and the Reverend Abraham Akaka who gave the Benediction.

Religious observances telecast to many countries

Religious observances of the Catholic and Islamic faith were viewed widely over the Christmas Holiday with the Papal Mass carried to 24 countries and the Hajj (Muslim pilgrimage to Mecca) to eight.

The Holy Mass celebrated by Pope Paul VI at St. Peter's in Rome on Christmas Day was carried over the Atlantic Ocean satellite to 15 countries, over the Indian Ocean to six and over the Pacific to three. The special program originating in Rome included the opening of the Holy Year Door at St. Peter's as a symbolic gesture associated with the Holy Year celebrated every quarter of a century.

A special program covering the Hajj, produced for the first time by Saudi Arabia Television, was telecast from the earth station in Jeddah over the Indian Ocean satellite to five countries and over the Atlantic to three.

According to International System Division's Analysis and Traffic, the Holy Mass was transmitted from the Italian earth station at Fucino over the Atlantic INTELSAT IV to the United States (2:10 hours Receive Time); Brazil, Ecuador, Jordan, Mexico, Panama, Peru and Venezuela (2 hours each); Argentina and Chile (1:59 hours each); and Colombia (1:55 hours).

Retransmissions of the Mass were carried over the Atlantic satellite from the Andover, Maine, Earth Station to Puerto Rico (1:55 hours) and Jamaica (1:50 hours); and from the French earth station at Pleumeur Bodou to the Ivory Coast (2 hours) and Iran (1:40 hours). Total Transmit Time placed on the satellite by the Fucino Earth Station amounted to 2:10 hours. Total Receive Time of countries serviced by the Atlantic Ocean satellite totaled 29:28 hours.

By Indian Ocean satellite, the Mass was transmitted from Fucino to Australia and Lebanon (2 hours), Zambia (1:51 hours), Japan (1:13 hours), Indonesia (40 minutes) and Hong Kong (35 minutes). By Pacific Ocean satellite the ceremony was transmitted from Hong Kong to New Zealand (35 minutes) and from Australia to the Philippines (2:05 hours) and Korea (40 minutes). Total Receive Time by countries serviced by the Indian and Pacific Ocean satellites totaled 11:39 hours.

Receive Time of the Holy Mass by countries serviced by satellites in the three-ocean area amounted to 41 hours and seven minutes.

The Muslim pilgrimage to Mecca (Hajj) was transmitted from the Saudi earth station in Jeddah over the Indian Ocean satellite to Italy (31 minutes); Indonesia, Kuwait, Lebanon and Pakistan (30 minutes each); with retransmission from Fucino over the Atlantic Ocean satellite to Sudan (31 minutes), Jordan (30 minutes) and Iran (10 minutes). Transmit Time from the Jeddah Earth Station amounted to 31 minutes. Receive Time of the pilgrimage totaled three hours and 42 minutes.

Data contained in the foregoing story was compiled by Charlotte E. Barlow of ISD's Analysis and Traffic.

People and Events

Dr. Sekimoto elected Director of Nippon Electric

Dr. Tadahiro Sekimoto, an INTELSAT Nominee from Japan from 1965-67, was recently elected Director of Nippon Electric Company, and concurrently appointed its Associate Senior Vice President, Transmission and Terminals, Wired Communications Group.

Dr. Sekimoto joined COMSAT's Engineering Division as Department Head of the Modulation Techniques Department in August 1965, and later became Manager of the Communications Processing Laboratory of the new COMSAT Labs. In this role he was instrumental in the design of the SPADE system which is now in operation in the INTELSAT network.

Millstein joins COMSAT Legal Staff

Leo Millstein has joined the Office of General Counsel as a Patent Attorney in the Division of Patent, Data and Trademark Matters, according to an announcement by William H. Berman, General Counsel.

Mr. Millstein is a candidate for a Juris Doctorate degree from George Washington University and holds a Bachelor of Science in Aeronautical and Astronautical Engineering from Purdue University, Lafayette, Indiana. Mr. Millstein has been a Patent Examiner in the U.S. Patent Office, Arlington, Va.

CEA Officers Elected for 1975

Elections were held in February to fill positions on the COMSAT Employees Association Board of Directors. Elected to office for the current year were: William Schaefer, President; Louis Early, Vice President; Sandra Fox, Secretary; Donna Higgs, Treasurer; Vincent Jordan (Plaza) and JoAnn Wagner (Labs), Membership; Evelyn Smith (Plaza) and Dirk Vanderloo (Labs), Social Events; Carol Louthan (Labs) and Evelyn Smith (Plaza), Athletics.

Ten-Year Awards

Service awards were presented recently to COMSAT employees with 10 years service with the Corporation. Receiving the awards were, left to right, William D. Young, John H. Heck, Alan R. Coburn, Carl J. Reber, Donald E. Greer, William D. English, Hans J. Weiss, Richard L. Hammerly, COMSAT President Joseph V. Charyk presenting the awards, Norman E. Schroeder, Nelly S. Brooks, Alexander Yenyo, Dennis V. Neill, Gene E. Christensen, Arnold W. Meyers, John P. McCusker and George D. Dill.

Asst. General Counsels appointed at COMSAT General

John B. Gantt and F. Thomas Tuttle have been appointed Assistant General Counsels of COMSAT GENERAL Corporation according to an announcement by William D. English, Vice President-General Counsel.

Mr. Gantt joined COMSAT GENERAL as a General Attorney in September 1973. In November 1974 he was appointed by the Board of Directors of COMSAT GENERAL to the position of Secretary of the Corporation. Prior to joining COMSAT GENERAL, he had been with the Office of General Counsel of COMSAT since 1966.

Mr. Tuttle joined COMSAT GENERAL as a General Attorney in July 1974, with primary responsibility for the legal aspects of COMSAT GENERAL's regulatory activities. Prior to joining COMSAT GENERAL, he had been with the Office of General Counsel of COMSAT since 1968.

Mr. Gantt holds a BS in Physics from the Carnegie Institute of Technology. Mr. Tuttle holds a BS in Mechanical Engineering from the Georgia Institute of Technology. Both received their LLB degrees from the University of Virginia Law School.

Weil designated legal officer for AEROSAT

Davis S. Weil, Jr., has been designated Legal Officer for COMSAT GENERAL's AEROSAT Space Segment Office to be located in Holland, according to the Corporation's Vice President and General Counsel, William D. English.

In his new capacity, Mr. Weil will have responsibility for providing legal assistance and advice to the Director and staff of that Office. The Space Segment Program Office, to be located at the European Space Research & Technology Center (ESTEC), Noordwijk, Holland, has responsibility for the implementation of the Arrangement to Establish an Aeronautical Space Segment Capability between the European Space Research Organization, COMSAT GENERAL Corporation and the Government of Canada.

Joining the Office of the General Counsel of COMSAT GENERAL in July 1974, his duties have included the provision of legal services associated with the international and commercial activities of COMSAT GENERAL.

Mr. Weil holds a BS in Economics from the Wharton School of the University of Pennsylvania and received his LLB from Case Western Reserve University. He has also done post graduate work at the University of London.

Five-year awards

COMSAT Labs employees receiving five-year awards from Dr. Burton I. Edelson, Director, (seated, left), are JoAnn Wagner (seated, at center) with S. J. Campanella looking on; standing, left to right, Walter L. Morgan, Marvin D. Ginsberg, Gordon E. Bush, Carol H. Louthan, Henry L. Parker, Allanina G. Cramer and Ali Abu-Taha.

Keane goes to Europe

Leo M. Keane, formerly Assistant Program Manager, Space Systems, Mobile Systems Office, has been selected to be the Deputy Director of the Space Segment Program Office (SPO) being established in Europe. The Office will implement the AEROSAT space segment program in accordance with the Arrangement recently concluded among COMSAT GENERAL, ESRO and the Government of Canada.

Mr. Keane will be replaced by James P. Wilde who will assume program responsibility for the development, deployment and test of the MARISAT satellites as well as technical liaison with the U.S. Navy in leased service arrangements.

Network Bits

ANDOVER. Two new employees have joined the Andover staff. **Al Gerace,** formerly with the Rumford Police Department and Chief Engineer for Radio Station WRUM in Rumford, as Senior Technician, and **Barbara Richardson,** formerly with Andover Wood Products, as Accounting and Personnel Clerk. Barbara and her husband John, an employee of the Oxford Paper Company, have four children. Al, who still serves as an advisor to Station WRUM, is married and his wife Sandra works as a nurse at the Rumford Community Hospital.

Andover COMSAT Wives held a luncheon at the home of **Mrs. Herman Sauret** and surprised **Andrea Conner** with a baby shower. Andrea, and her husband, Senior Technician **Jack Conner,** are expecting their first child.

Richard "Sven" Engblom was promoted to Electronic Supervisor, **Charlie Jaros** to Technician, and **Joanne Witas** (your correspondent) to Material Control Specialist.

Construction on the new antenna is progressing well in spite of a typical Maine winter. The construction crew has enclosed the foundation with plastic to help ward off the cold and the wind. Most of the steel for the base and the "dish" have arrived and work is underway. **—Joanne Witas**

BREWSTER. At the annual Christmas Party held at the Elks Club in Omak, the staff presented a silver tray to **Jim** and **Connie Peasley** as a farewell gift prior to their departure for the Santa Paula Station. Jim departed in January followed by wife Connie and two daughters in February.

There was a good turnout for the annual CEA Ski Party to Echo Valley by station personnel and their families. Both the weather and the food were great.

Harvey Andersen, Operations Supervisor, is recuperating from open heart surgery in the Sacred Heart Hospital in Spokane, Washington. **Richard Eliason,** Operations Supervisor, has transferred to the M & S Service Center.

—W. M. Lauterbach

CAYEY. After six tries, the station recorded 100 percent attendance at the Christmas luncheon held in the lounge for station personnel. The food, donated by and prepared at the

Cayey staffers and family make some hard decisions.

homes of station employees, incorporated all the typical "puertorrican" delicacies of the season and included a pit-roasted calf, rice with green peas,

Arsenio Reyes does the carving assisted by Luis Medina and Paul McGranahan.

"just like being in the Army. You wait, and wait, and wait . . . "

boiled green bananas, boiled plantains and a fantastic assortment of desserts—even a German fruit cake. Gifts were exchanged and the spirit of the holidays took on special meaning with station personnel distributing a portion of their Christmas Table to the Cayey House for the rehabilitation of drug addicts.

Juan Sierra pins second lieutenant's bars on son Nestor Anthony.

Senior Technician **Juan Sierra** had the honor recently of pinning second lieutenant bars on the uniform of son **Nestor Anthony**, a Bachelor of Science graduate from the University of Puerto Rico. Young Anthony, who participated in the ROTC Program, was sworn into the Regular Army and will report to the Academy of Health and Sciences at Fort Sam Houston, Texas, after which he will be assigned to the U.S. Army in Europe. **—J. Gonzalez**

ETAM. A teletype circuit has been established between the Etam Earth Station and its counterpart station in Moscow. The circuit will be used as part of the "hot line" communications between Russia and the United States. There has been a significant increase in the workload of station personnel as the result of the importance placed on the circuit.

This columnist was nominated to be Chairman of the Etam COMSAT Employees Association for the 1975 calendar year. Other representatives nominated include, **David Cross, Paul Helfgott, Rupard Hobbs, Paul Mauzy** and **Bob DeNigris** representing ITT. The station was involved in the recent DIGISAT demonstration conducted between L'Enfant Plaza and the Goonhilly Earth Station.

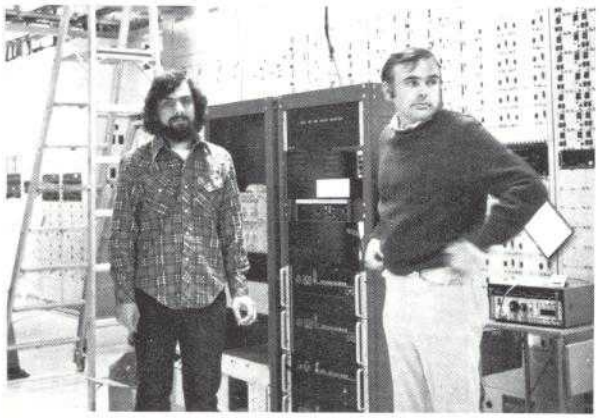
—Bev Conner

FUCINO. Lee Jondahl and his family have done considerable traveling since their arrival at Fucino. One of their family trips took them to Naples, Pompeii and Mt. Vesuvius. Another tour found them in Florence with a visit to the Leaning Tower of Pisa. Lee reported the trips to be very enjoyable but came back from the trips exhausted from carrying the new luggage he had to buy to hold all of his wife Mary's bargains. The Jondahls spent the New Year's Holiday in Vienna, Austria, and found the Alps in the winter a breathtaking experience.

To welcome in the New Year, husband **Darrell** and this correspondent gave a party for some of the staff members. To assure good luck in the coming year, lentils and pigs feet were served as a matter of custom. **Don Pavlack** has been nominated "Baby sitter of the year." Since the Pavlack's new daughter arrived he has had little time for his "hobby" of electronics. **—Dorothy Riddle**

Etam's Bill Mayes waits for the carrier from the Moscow earth station to appear on the receive spectrum.

Carl Cooper converses with the Moscow station by teletype!



Nick Marzella (left) and Marv Bowser were the coordinators at Etam for acceptance testing of DIGISAT with equipment used during the demonstration.

GENEVA. COMSAT's European Office will soon be seven years old, making it almost a permanent fixture in Geneva. To commemorate the opening of its new office facilities, the European Office held an Open House late last year. It was highly successful, with several important personalities among the estimated 80 persons in attendance. Our guests seemed impressed with the bright, well-planned offices, located in a completely renovated and very old building in downtown Geneva.

A recent Swiss national referendum aimed at reducing the number of foreigners in Switzerland over the next few years was soundly defeated in October of 1974, thereby removing a cloud of uncertainty over the operations of many American and other foreign companies located in Switzerland. The geographic position of Geneva, with its easy access to all points in Europe, Africa and the Eastern Mediterranean, continues to be ideal for COMSAT. Furthermore, the proximity of the ITU and other international organizations enables the office to maintain COMSAT's close working relationships with these bodies.

1975 promises to be a very busy year for the EO. The geographical areas of responsibility of the office, namely Europe, the Middle East and Africa, are all establishing important

The staff of the Geneva office gathers during the recent Open House. Seated, left to right, Susan di Maglie, Alice De Normandie, Gabrielle Koener and Catherine Mercier. Standing, left to right, Director Mats Nilson, Robert Brown and Helmo Raag.

Dr. Nilson and Administrative Assistant Ms. De Normandie receive guests during the Open House at the European Office. Left to right are: Walter Etienne, Assistant Director of Swissair; Mohammed Mili, Secretary General of ITU; Dr. Nilson and Ms. De Normandie; and Mr. Ibnou-Zekri, ITU legal advisor.

Pictured with Dr. Nilson at the Open House are Robert Vieux, Chief of Protocol for the Canton and City of Geneva (center), and Leo Sandel, Second Secretary of the U.S. Mission in Geneva.

Helmo Raag of the Geneva Office (extreme left) chats with Open House guests, left to right, Mr. Rutschi of the Swiss PTT, Brian Davidson of INTERAVIA, and R.M. Lindsey, the CCIR Administrator.

milestones in the field of satellite communications. The Europeans have just launched their first telecommunications satellite "Symphonie" and within a few years will be actively engaged in space applications in the areas of maritime and aeronautical communications as well. The Arab countries are presently planning an Arab regional satellite system, and the majority of countries in Africa will have access to INTELSAT by 1977. Both Algeria and Norway will initiate domestic communications services in 1975 using INTELSAT leased transponders.

The EO functional areas of responsibility include keeping COMSAT Headquarters informed of these developments as well as maintaining active contact with COMSAT's foreign partners in INTELSAT on matters of interest and issues of importance to the Corporation. For instance, in the case of the Norwegian domestic satellite communications network, EO personnel were instrumental in early stimulation of the consideration of the satellite possibility by the Norwegian Telecommunications Administration.

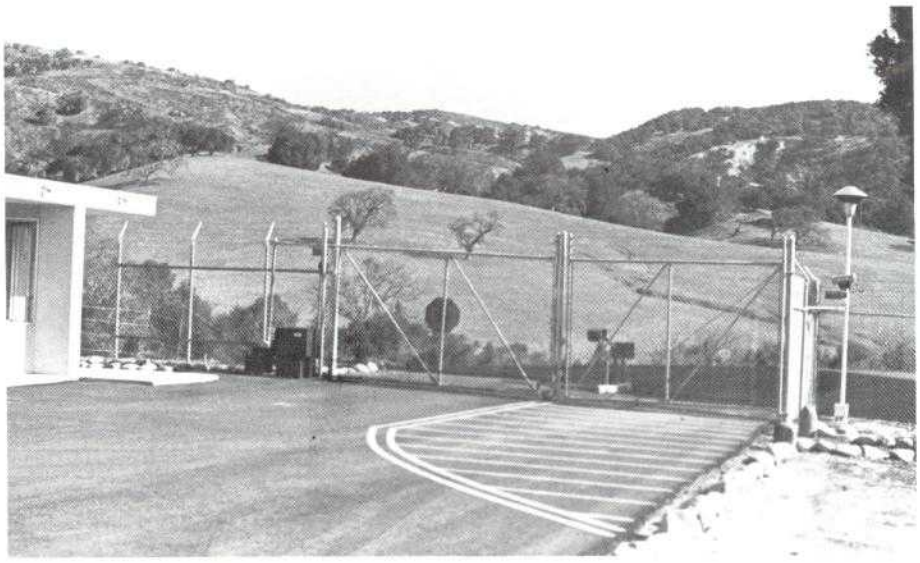
In addition, efforts on a continuous basis serve to protect the business interests of COMSAT GENERAL. For example, the EO was very much involved in the process leading to the selection of COMSAT GENERAL as the US partner to ESRO on the AEROSAT Program; maritime satellite progress is closely monitored in the European countries with the aim of ascertaining the role that COMSAT GENERAL'S MARISAT System will play with respect to follow-on maritime satellite generations.

Lastly, there are several opportunities for COMSAT GENERAL technical assistance activities in various countries throughout the regions of responsibility of the EO and the EO has, in the past, alerted the Technical Services Division of COMSAT GENERAL to various business opportunities.

Dr. **Mats Nilson** is Director of the European Office. **Helmo Raag** and **Robert Brown** serve in the capacity of Liaison Officers—Helmo much involved with the ITU activities and Bob with development in Africa. This columnist, as Administrative Assistant, keeps the office running on an even keel with the capable support of the secretary/translation staff, **Susan Di Maglie, Gabrielle Koener** and **Catherine Mercier.** To add a little spice to the international flavor of the EO and its activities, we might mention that the four female staff members represent four different nationalities: this writer is American, Susan is British, Gabrielle is German and Catherine is Swiss. All together, the office commands about seven languages. **—Alice De Normandie**

JAMESBURG. A new system of security has been introduced here at the station, eliminating the need for security guards. The new system is comprised of an eight-foot cyclone-type, manproof fence, television surveillance, an audio intercom and a gate control system. The closed-circuit TV provides close-up pictures of visitors to the station as well as a wide angle infra-red surveillance for nighttime viewing of the entrance area to the main portion of the station compound.

At the approach to the main gate a sign explains our visiting hours. A pedestal-mounted call button sounds a buzzer in one of the control units in the building to announce a visitor. If



The guard station at the left is unoccupied as the camera on the light standard at the extreme right takes over the responsibility for screening those arriving at the Jamesburg gate.

Mrs. Patty Blatnik, station secretary, monitors the control console in the Administration Office. All visitors and employees entering the Jamesburg Station appear "on camera" before proceeding through the entrance.

The wide-angle infra-red camera scrutinizes all visitors and employees to the Jamesburg Station.

the visitor is to be admitted, the gate is operated remotely from either of the control units in the building. The gate closes automatically once the vehicle has passed through. During normal working hours, Monday through Friday, the gate is controlled from the console in the Administrative office. During the remaining time, control is performed by the operations personnel on duty in the Control Room.

Station personnel gain entrance by operating the cipher lock switch also mounted in the pedestal. A buzzer sounds as soon as the automatic gate begins to function alerting duty personnel to its use. It is anticipated that savings realized from discontinuance of security guards will pay for the new installation within 18 months, with increased savings in the years ahead. **—W. E. Neu**

PAUMALU. 1975 is the year of the Rabbit, according to the ancient Oriental zodiac calendar. And according to the tradition of the rabbit, this could be the year of "plenty" for Paumalu if the pace of activities since the first of the year is an indication of things in store for the station.

The arrival on station of **John Hewitt** from ESED (Earth Station Engineering Division) on January 22 signalled the start of the installation of the 3KW HPA's (High Power Amplifiers) at the Pam-II antenna. Installation and checkout of the equipment was accomplished during the period January 20-February 8. Electronic Maintenance Supervisor **Charlie Wong** and Senior Technician **Tommy Ota** of the station staff assisted the two men from Aydin Energy Systems in the installation and checkout of the equipment. **Joe Chow** and his Facilities crew handled the installation of power and control cables for the new HPA's. The 3KW HPA's have replaced the 8KW units and are expected to save the station approximately 36,000 KW hours per year.

In connection with the installation of the 3KW HPA's one of the displaced 8KW HPA units was packaged and shipped to Andover where it will be installed. **John Hewitt** is expected to be at Andover to supervise the installation and checkout of that unit. The remaining unit will be held pending final determination as to its ultimate use. In the meantime, Paumalu is awaiting the arrival of the 800KW Waukesha Engine Generator from Etam which will replace our existing unit.

In the midst of all these activities, the operations crew completed Phase I of the PAC-14 Transition Plan (Pacific Region) which involved retuning filters, changing frequencies, and reconfiguring basebands.

—Bob Kumasaka

PLAZA. More than 100 enthusiasts, employees and their families, headed to Pennsylvania for a CEA sponsored day of skiing and fresh air at the Blue Knob ski resort, about four hours west of Washington.

Car pools and chartered buses carried the skiers and their equipment to Blue Knob from Headquarters and the Laboratories. The day's activity began in darkness around 6:00 a.m., when the first bus pulled out from the Paza amid dampness and rain. As the bus approached the Laboratories the rain gradually turned to snow, putting the group in a good mood for a day of skiing.

The slopes at Blue Knob were in good condition that day. Snow had fallen the previous night and, along with man-made powder, brought the slopes up to a "very good" rating.

Most skiers categorized themselves as novices, but after an hour and a half ski lesson, many in the group felt like experts and were soon negotiating the twists and turns of the beginners' slope which was in excellent condition. Later in the afternoon, many in the group, armed with a morning of practice on the beginners' area, headed for the intermediate slopes. Several seemed to handle the advanced hills and turns well, but a few should have practiced on the smaller slopes for a while longer (ask anyone who hit that tree in the middle of the two-mile intermediate run).

Around 4:30 p.m. the group was ready for the return trip to Washington. If the lack of conversation and movement on the way home was any indication of the physical feelings of the skiers, all had had an enjoyable day and were ready for a good night's rest.

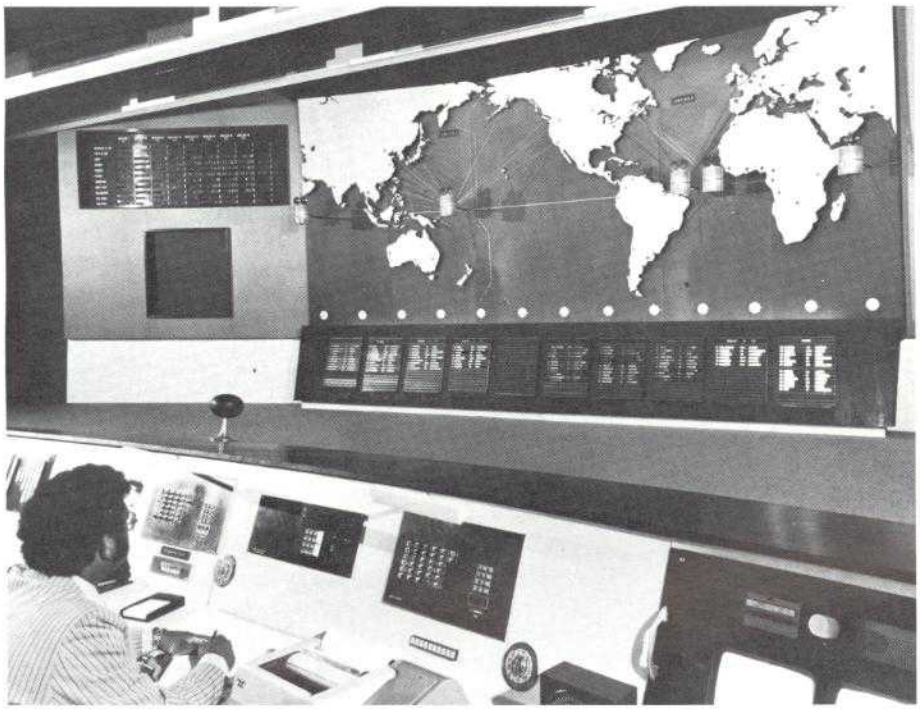
The Diplomat Parking Corporation has notified COMSAT that, *Effective immediately, any car illegally parked in an area other than assigned to* COMSAT *will be "booted," and there will be a* **$***10 charge. This charge must be paid before the automobile is allowed to exit from the garage.*

Employees authorized to park on either the Red or Blue levels and unable to find parking space, must go to the Diplomat Parking Office located on the Red level adjacent to the exit lane where, upon presentation of identification, parking space will be provided. Authorized personnel are cautioned *to avoid making arrangements with parking attendants.* Arrangements must be made through the office.

Donna Higgs is in receipt of a letter of appreciation from Children's Hospital to the COMSAT Employees Association for the contribution of toys and money totaling $226 over the Christmas Holidays. Part of the letter stated, "Your thoughtful gifts did much to brighten spirits and make the situation much more tolerable for our little patients. . . ."

Charles Dorian, Manager Maritime Planning, was recently elected for a two-year term to the Board of Directors of the Radio Club of America, the world's oldest existing radio-electronics scientific society. The club was formed in 1909 for the purpose of enabling those interested in wireless to exchange ideas and to fraternize with others having the same interest.

COMSAT's Operations Center: a window to the world



Controllers staff the Operations Center 24 hours a day with the capability of reaching any earth station in the world-wide network at their fingertips.

The following interview between Lawrence A. Covert, Operations Center Manager, and John Peterson, COMSAT News Editor, is published to provide a better understanding of the key role the Center plays in the worldwide system of satellite communications.

Larry, for the average visitor to the Operations Center and probably for many of the COMSAT employees, the actual story of the Center is pretty much limited to what can be seen through the glass partitions. So, in the name of better understanding, let's dissect the Operations Center to see what role it plays in the worldwide communications satellite network. First, how about a little of its history?

The original Operations Center was established while COMSAT was still located in its former quarters at 21st and L Streets. From the beginning it was considered necessary that there be some means of keeping in touch, in real time, with the performance of the system. Some aspect of operations had to deal with monitoring the system if for no other reason than that appropriate staff people be advised. It would be impractical to put together such a system and then have no means, for example, to diagnose a malfunction in the event one occurred.

Today's Operations Center is basically an expansion of the original concept. In its early form it included a Communications Center and a Spacecraft Technical Control Facility with status boards providing information on each of the satellites. With the move to L'Enfant Plaza and the expansion of facilities a separate control center was established for Spacecraft Technical Control, and the present Operations Center was designed with the foreseeable expansion of the global system in mind. A display board was added which, in my opinion, has proven to be a tremendous aid in demonstrating the size and depth of the global operation.

When I came to the Operations Center in April, 1969, we had about 45 operating earth stations worldwide. You could just about remember each of them, where they were and the amount of service flowing through each. The number of administrations we had to deal with was considerably less. Today, the list of earth stations has doubled and several stations now have two or more antennas, and, of course, there has been a proportionate increase in the number of administrations with which we coordinate.

What makes this Operations Center unique? Are there others similar to this?

This has to be a yes and no answer. Yes, in that other organizations involved in the satellite business maintain some means of keeping track of the performance of their specific spacecraft. And no, in respect to an international system of communications. In this area, the Center is the only one of its kind that I know of in existence in this or any other country. For example, here in the Center we maintain real time guidance and control of operations relative to worldwide communications services involving record service, telephone, data and television. In the realm of television, the Operations Center is unique in that this is the only system in the world

Operations Center Staff

CENTER MANAGER:
Lawrence W. Covert
OPERATIONS MANAGER:
Donald S. Ross
CONTROLLERS:
John E. Gray
Walter E. Gugler
Lawrence J. O'Hara
Arnold P. Sanchez
COORDINATORS:
Devron L. Hunsley
Melvin T. Link
Thomas Tilford, Jr.
Donald S. Tucker
OFFICE COORDINATOR:
Mary E. Huggett

Requirements on Center demanding and complex

Television service	
Number of stations involved	1,244
Total transmit time (hours)	310:56
Total receive time (hours)	399:31
Total half-channel hours	710:27*
Space Segment operations	
Spacecraft gain step changes	15
Spot beam pattern changes	16
Transponder saturation tests	900
Earth station operations	
Satellite radio link tests	37
Performance of long RF loop tests	21
Authorized channels for SPADE loop testing	18
Controlled establishment of RF carriers	76

*Comparable to one month's continuous operation from ground to satellite (half-channel) when translated into 24-hour days.

Recently the Operations Center was requested to submit a report of its activities during the four-month period beginning August 1 and ending November 30. A brief summary of the period's activities will give the reader some idea of the requirements placed on the Center.

Coordinated establishment of proper operating parameters	
television	32
audio	16
message carriers	12
Spacecraft System Monitoring	
Utilized SSM facilities	535
Monitoring leased half-transponders	68

Implementation of contingency plans	
Participated in cable restoration	4
Earth station restoration	2
Restoration tests and exercises	5
Initiation of message service	11

The largest single event recorded during this period was the Ali/Foreman heavyweight championship fight carried from Zaire. (COMSAT News, Nov./Dec. 1974 issue). Also during this period, the French daily news service split into two separate time periods with simultaneous transmissions carried over the Indian Ocean and Atlantic Ocean primary paths, and a new type of television service between the U.S. and Europe was initiated by the European Broadcasting Union (EBU).

capable of handling international TV. We are involved in all communications operational configurations, and although a high percentage of communications paths include the U.S., a majority of the current operational paths are between two or more foreign terminals. So, in its all-encompassing aspect, our Center is probably the only one of its kind.

In making reference to the Operations Center one can hear it referred to as the INTELSAT Operations Center or the COMSAT Operations Center. Is there a mating of the two?

The Center has a dual responsibility. On the INTELSAT side of the operation it serves the Management Services Contractor and our area of involvement includes satellite and earth stations located throughout the world. On the COMSAT side we refer to our responsibilities related to U.S. Systems Operations, which involves the U.S.-managed earth stations and the U.S. commercial communications carriers or authorized "users."

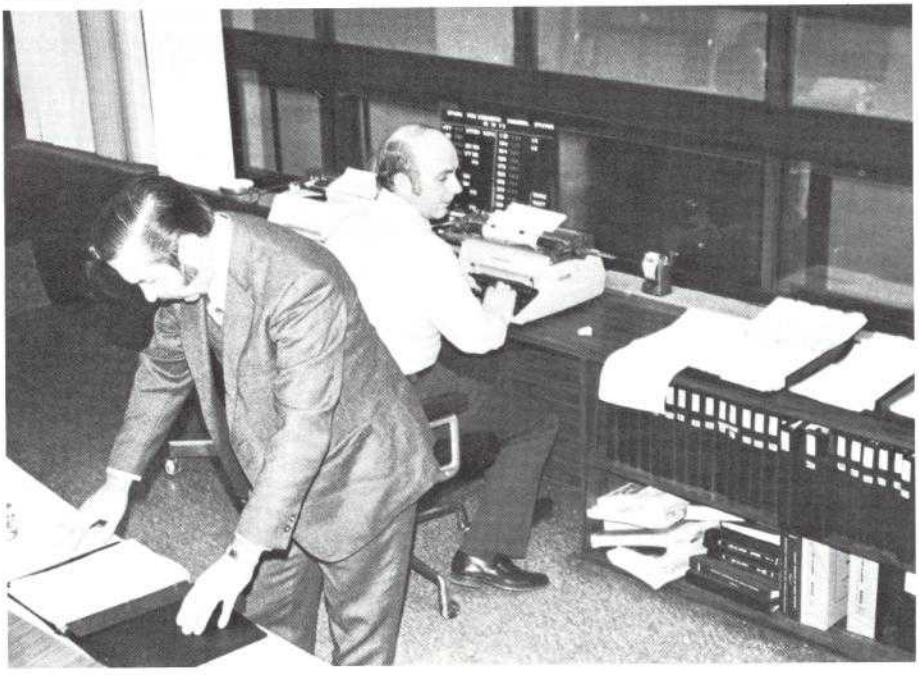
Perhaps one of the reasons for some of the confusion in terminology has to do with a redundancy of words. The Operations Center is divided into a Control Center and a Communications Center. Then, immediately adjoining us is the Spacecraft Technical Control Center, a separate entity. So we wind up with an abundant use of the term Center.

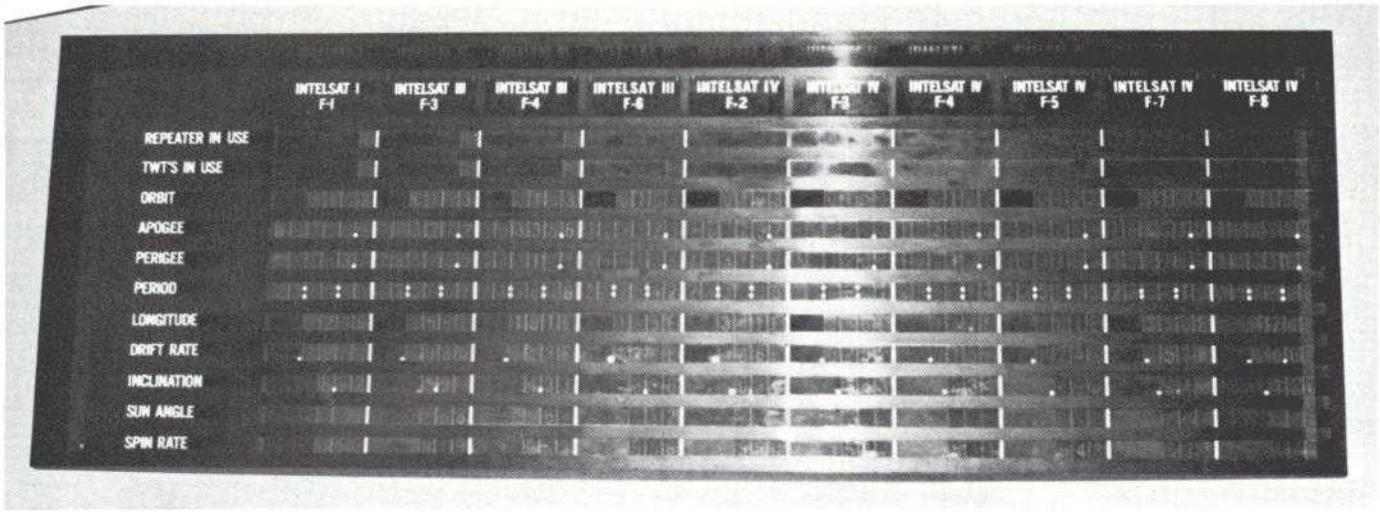
One hears constant reference to the Space Segment. As a beginning, when one of the technical staff refers to the Space Segment, what specific portion of the global network is he talking about?

The Space Segment begins at a theoretical spot above the antenna of an earth station as it points toward a satellite and from that satellite to a similar theoretical spot above another antenna. This is in actuality the Space Segment.

You mentioned earlier the need to monitor the performance of the global system. Exactly how do you go about gathering and evaluating the data necessary to gauge the system's operation?

Around the clock, two-man teams man the Operations Center. Team A consists of Lawrence J. O'Hara, Controller (standing), and Devron L. Hunsley, Coordinator.





A status board in the Center keeps the Controllers apprised of flight data on each of the operational satellites.

To begin with, we don't have any remote indicators here giving us automatic readouts on the operation of the system. We draw on various sources to collect the necessary information. For example, we gather data from monitoring stations located at Andover, Maine; Fucino, Italy; Carnarvon, Australia; and Paumalu, Hawaii. These are the same stations used by the Spacecraft Technical Control people. The equipment located at these stations permits examining the down-link radiation from an individual satellite. We would also be advised by operating earth stations of any significant change in service status noted at a particular earth station, which in turn would lead to further investigation. Keeping abreast in this fashion on a worldwide basis presents a pretty good idea of the system's performance. So, by such monitoring and the conduct of inquiries relevant to selected aspects of the service we insure the system's operation in the prescribed manner.

I'm not quite sure at this point whether we're concerned with the health of the satellite or the quality of traffic passing through the system. Is there a dividing line between monitoring performed by the Operations Center and that performed by the Technical Control Center? Are you monitoring traffic while they monitor the satellite's health?

It's pretty difficult to separate the two. Although we are not primarily concerned with diagnosing the satellites it would be quickly apparent to us in service reports if there should be any deterioration of the signal. We are basically concerned with traffic, with service. However, there is close liaison between ourselves and STCC. It is necessary that we be kept aware of changes in the status of the satellites and any maneuvers taking place just as it behooves us to keep the people in STCC informed of any irregularities or peculiarities reported to us by the earth stations. I guess what I am saying is that although our responsibilities differ it is essential that the two interrelate with full knowledge by each of what the other is doing.

Let's be more specific. Suppose some kind of a satellite malfunction occurred, how would the Operations Center cooperate with the technical control people to restore or correct the malfunction?

Normally, Spacecraft Technical Control personnel or Operations Center personnel would learn through their various monitoring systems that there was a malfunction. We in the Operations Center would immediately contact those stations that normally operate with that satellite by the quickest means necessary. For example, in the Atlantic area you have several earth stations operating with both satellites, so that even if one path was disrupted we could reach them through the other satellite path to obtain information, as quickly as possible, relative to the malfunction. We would coordinate very closely with the spacecraft control personnel advising them of our findings. They in turn would be collecting telemetry and data through such paths available to them regarding the status of the satellite.

At a point of time, depending on the nature of the problem, a decision would be made as to whether the malfunction was a minor one, easily correctable, and we would be back in business very shortly. Or it might involve implementing one of contingency plans distributed to the field which instruct the earth stations what they shall do in regards to changing over to another satellite, so they may continue business, although in recent years such plans have been rarely needed. However, it is still a policy—and good business—to be prepared for any type of contingency in the system.

Our contingency plans also include a means of broadcasting over an existing contingency path so that we can get information to all stations affected and advise them as to the action they should take so that we might restore service quickly. In all of this action, of course, we would continue to conduct liaison with the spacecraft control people. And if we switched to another satellite we would again keep them advised of the status of the changeover and the operational conditions as we go back into operation.

Leaving the space segment and considering the earth stations, how does the center maintain an

awareness of the status of earth stations?

We are kept knowledgeable by the reports from the earth stations themselves or from an earth station with which they are normally conducting service. I guess a good example of this would be in the case of a station having a hazardous condition, that is, a condition which could affect communications service. In this case the stations would advise the operations center that they are in this condition so that, in the event the condition turned into something more serious, disrupting communications, we would have been alerted and ready to implement a contingency plan.

One of the areas you might find this happening a little more frequently than others is in the Pacific Ocean region, in that some of the stations are in the normal typhoon path. As they or their administrations become aware of such conditions they advise the Operations Center, then keep us advised as the condition improves or deteriorates. Sometimes they don't have the opportunity to give us advance notice. However, if there is a loss of service the earth stations or their administrations are responsible for getting word to us by any means possible. They would also advise us if alternate routing of services were desired.

The administrations of such stations normally have mutually agreed on plans for restoring some of their service. In cases where a situation develops without advance notice, which incidentally, happens rarely, we could be called upon to assist in an *ad hoc* arrangement so that certain services could be restored to that area.

What is the tie-in between your operations center and Satellite Systems Monitoring?

The SSM, the Satellite Systems Monitoring facilities, are a very essential tool in our everyday operation. When radio links are established between stations, when they are first coming into being, INTELSAT prescribes specific tests which must be conducted with certain required benchmarks for the stations to be accepted into service. During these tests, prior to the establishment of radio links, we use the SSM facilities to determine the character of the radiation from the satellite, which, of course is dependent on the up-link radiation of an earth station. To ensure that the transmissions from the earth stations are proper we also would use these SSM facilities in our daily operations if we have a question relative to service or radiation.

If we feel a station is not radiating properly we use the SSM as our tool to look at satellite radiation as it relates to the transmissions of that station and, if we find such transmissions are not of acceptable standards, we direct the earth stations as to what action to take. We would then monitor, through the SSM stations, the correction of this problem.

This brings us back to the basic step, that once the radio link has been established the earth station is instructed to maintain this specific power and the normal configuration. Earth stations do not make any significant change in their radiation to the satellite without authorization from the Operations Center. We receive reports on a daily basis from the monitoring stations relevant to down-link measurements of all the transmissions from all the satellites. And, of course, use the SSM to monitor transmissions we feel need looking at, at any point in time.

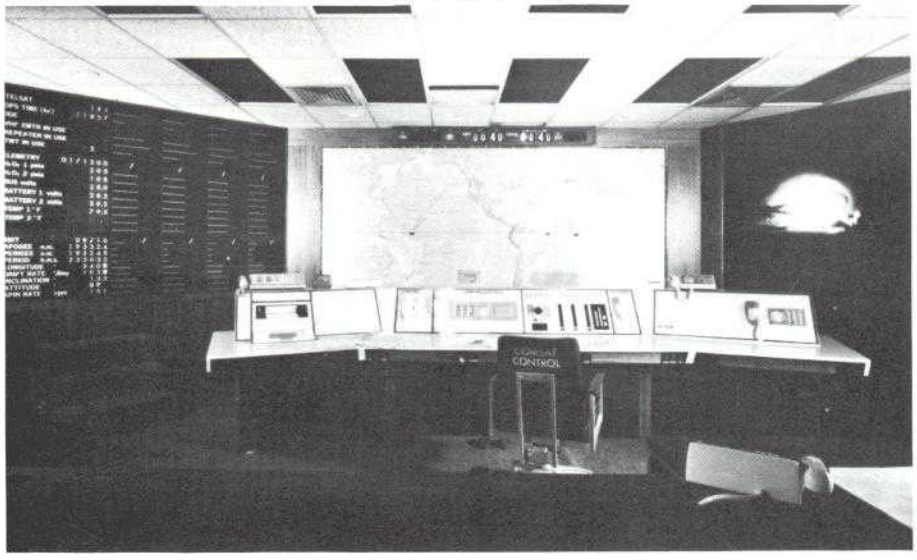
There must be times when the normal routes of traffic do not meet the needs of a specific request. How do you go about responding to such a requirement?

Well, incidents of this nature are not rare but again they are not something that happens every month. Special configurations are probably more frequently used in television service than in normal message service. A good example of this would be during the days of the Apollo program when special configurations were used during the recoveries. For example, the recovery ship would transmit to our Jamesburg earth station on a transponder that would be made available for this particular transmission.

From Jamesburg the signal would go on to Houston where it would then be made available for commercial use. The sound would be added and it would then be relayed on by terrestrial means and back again to Jamesburg as well as to the east coast stations for commercial transmission throughout the world. Now in the Jamesburg case, of course, we would be sending this back out commercially on a different transponder. So in essence we set up a special link, nonpublic so to speak, to get the transmission to Houston.

We have something similar to this coming up for the Apollo/Soyuz mission involving two-way television transmissions between Russia and the United States. Again the Management Services Contractor, along with staffs of the entities involved, has made arrangements for certain transponder configurations in the Atlantic area so we can handle this

The Operations Center as it looked before COMSAT relocated from its downtown quarters at 21st and L Streets to L'Enfant Plaza.



two-way link and at the same time have transponders available for distribution to the various INTELSAT earth stations for commercial use.

We do have other what you would call special configurations which we could use in the event of a cable failure for which we have contingency plans agreed to by the various INTELSAT entities and COMSAT where U.S. services are involved. In the event of such a failure we would be called upon to implement a particular restoration plan.

I came across reference to the term "Managers Network". What comprises this network?

The network you are referring to is the voice and telegraph network enabling us to communicate with operating stations in the system. What we have are terrestrial links between the operations center to the U.S. earth stations, further extended over satellite engineering service circuits to foreign earth stations. We have a private line going to Jamesburg, California; one to Andover, Maine; and two private lines between here and Etam, W. Va. The two lines are needed to Etam because of the large number of stations operating over the primary Atlantic path.

Now, on each of these lines we have the capacity for one voice circuit and up to five telegraph circuits. At the earth stations I just mentioned we have both the manual and the automatic capability to connect either the voice or the telegraph lines into the engineering service circuits directly to another earth station. We use this voice network very much in our day-to-day business, not only in getting information to earth stations but also for enabling them to quickly report any operational matter into the Operations Center. The telegraph lines are used primarily for passing message traffic and again this is a two-way deal. We pass all of our operational traffic over this network which insures that this traffic moves quickly and accurately. In turn, earth stations can pass on information to their administrations for appropriate action.

The primary purpose of this network is to provide means of rapid real-time communications, by voice and telegraph, between the Operations Center and any operating station in the world.

The Communications Center, which I understand you are going to treat separately, is of course a major user of the telegraphic service.

Since live television seems to attract the most attention, are there problems in handling TV service requiring it be handled differently from other kinds of service?

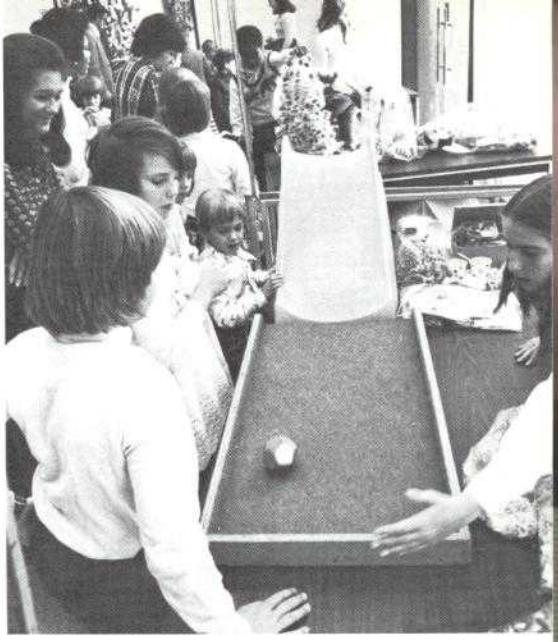
I would say the big difference is in the lead time allowed to configure for a televised event. We have had to learn to live with requirements for TV circuits with very little advance notice. Basically, we have to look at TV service as being the type of service required at any time, 24 hours a day, sometimes with only a few minutes advance notice but requiring instant action at earth stations as well as here at COMSAT.

There are instances in which we have TV orders well in advance. For example, we already have orders for late 1975 and the 1976 Olympics. But much of the service is generated about 10 or 12 hours in advance with a smaller portion involving requirements for service coming to us an hour or less before the event is to take place.

What makes TV service really stand out from the other types is that it is a dynamic thing. It comes up at any time of the day or night, depending primarily on world events, requiring the closest coordination between the Operations Center, earth stations of foreign administrations and the U.S. carriers since they must set the procedure into motion in their respective countries.

Actually, television service represents a very small percentage of the total, let's say two to three percent. But I would say it's the most closely associated with satellites by the public. Often, people are not aware that extensive use is made of the satellites for telephone communication, but they are quite aware of the relationship between live television and the satellite system. Unfortunately, when program video or audio suffers impairment at any point, the public holds the satellites responsible. They don't understand that regardless of how good a pipeline we might have between two stations, that this is only one of the links in the chain, and traditionally, in my opinion, the actual satellite link has proven extremely reliable.

The COMSAT employees Xmas Dinner/Dance held in the L'Enfant Hotel was an overwhelming success.



At the Children's Xmas Party held in the COMSAT Theatre attended by nearly 100 youngsters of COMSAT employees there were games. . . .

Spirit of good will abounds during holidays

socializing unawed by the DIGISAT demonstration in the same room . . .

lots of food . . .

gifts from Santa . . .

. . . and the expression making it all worth while.

COMSAT NEWS

March-April 1975
Vol. X No. 2

1975 School graduates

As in previous issues, the COMSAT News will again carry a listing with pictures of the 1975 high school and college graduates, the sons and daughters of COMSAT, COMSAT GENERAL and INTELSAT employees. Since the graduates will be included in the May/June issue, it will be necessary that material and photos be submitted to The Editor, COMSAT News, no later than June 10.

Photographs should be either graduation pictures or, in the absence of such, head and shoulder shots. Photos can be either black and white or in color. Accompanying material will be limited to the full name of the graduating student, names of parents (Mr. and Mrs. John J. Smith) or parent, working location of parent (Headquarters, Labs, Jamesburg, etc.), name and location of school, and, for college graduates, the degree earned.

Additional material deemed of general interest should be submitted to field reporters for consideration for inclusion in their individual columns.

Annual Shareholders Meeting

The 1975 Annual Meeting of Shareholders will be held Tuesday, May 13, at the Loews L'Enfant Plaza Hotel next to the COMSAT Headquarters Building at L'Enfant Plaza. The Meeting is scheduled to start at 2:30 p.m. in the L'Enfant Ballroom.

Editor's Notes:

COMSAT News bridges oceans

The COMSAT NEWS had a recent request from Juarez Medeiros of Companhia Telefonica Brasileira in Rio de Janeiro for regular receipt of COMSAT's bimonthly magazine. "As you know we are charged with the maintenance of the Company's telecommunication network, hence our interest to read articles such as 'A Measurement Experiment in the Land of the Midnight Sun.'"

The article referred to by Mr. Medeiros appeared in the November-December issue of the COMSAT NEWS and dealt with the conduct of an experiment for the Norwegian Telecommunications Agency by engineers of the COMSAT Labs. The special feature was written by Staff Scientist Joachim Kaiser with photographs provided by Kaiser and David G. Reiser.

The point being made is that the global operations of the technical people of COMSAT and COMSAT GENERAL find mutual interest for those involved in satellite communications worldwide—in this particular instance, from one continent to another, South America to Europe.

It is gratifying to know that through the COMSAT NEWS those involved in satellite communications can span oceans and keep attuned with happenings among their counterparts in other parts of the world. Similar material is welcomed and encouraged.

News in Brief

Alternative INTELSAT V design directed

Fourteenth Board of Governors Meeting directs MSC to proceed with preparation of Alternative INTELSAT V design.

INTELSAT management study conducted

Three professional management consultants study proposed permanent management arrangements for INTELSAT Organization.

Signatories set minimum investment share

Minimum position for representation set at that of 15th largest owner in the INTELSAT system.

Aerosat Office opened in Holland

COMSAT General Corporation opens Aerosat Space Segment Program Office in Noordwijk, Holland.

Shareholders to meet

1975 Annual Meeting of Shareholders scheduled for May 13 at Loews L'Enfant Plaza Hotel.

Satellite carries Labs experiment

Labs-built transponder carried on NASA Applications Technology Satellite conducts propagation experiment.

University radio station gets grant

Grant of funds to University of Hawaii's Radio Station KTUH-FM permits audience expansion.

Parliamentarians visit COMSAT

Western European Union Parliamentarians hosted by Senate Aeronautical and Space Sciences Committee get COMSAT briefing.

Credit Union elects Directors

Four incumbents and one new member elected as Directors at Eighth Annual Meeting.

Graduation time again

High school and college graduates of corporate and INTELSAT employees to be carried in May-June issue.

Special Features

Cover.
Ten years ago in April, Early Bird, the first commercial communications satellite was launched into synchronous orbit. This issue's cover is a montage of newspaper stories which lauded the beginning of a new era in space communications.

March-April 1975 **Vol. X, No. 2**

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Robert B. Schwartz, Director of Public Information
John J. Peterson, Editor
Edgar Bolen, Production
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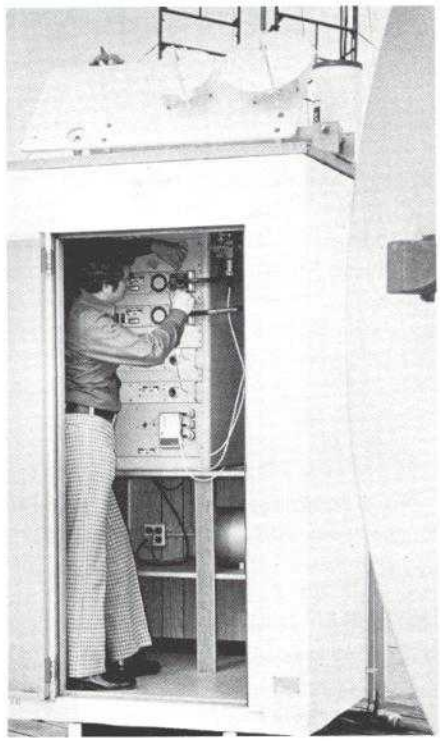
NASA satellite carries COMSAT Labs experiment

Don Witten of NASA's Goddard Space Center began his press release with the description, "The most complex, versatile and powerful communications spacecraft ever developed". Engineers at the Johnson Space Center in Houston, Texas, continue to refer to it with a familiarity one develops for an old but comfortable shoe or the tried and proven family car, as ATSEF (pronounced the way it's spelled).

Its official designation is ATS-6, NASA's Applications Technology Satellite No. 6. Originally, when launched on May 30, 1974, its designation was ATS-F, consequently the still used vernacular ATSEF, even though earlier members of this satellite family had numbers instead of letters. But those who have worked constantly with the newest member of the family still cling to the more personal "ATSEF".

Outside of the communications field of interest, little is known or heard of the ATS-6. However, much will be heard of it in the near future. When the Apollo/Soyuz manned mission takes place in July of this year, the satellite, poised over the Indian Ocean, will play a major role in keeping an eye on the American and Russian crew members and their spacecraft. Its role in the joint American/Russian venture will be discussed at greater length in a special feature in the May-June issue of this magazine.

But NASA engineers are not alone in their sentimental attachment to the orbiting satellite. Engineers at the COMSAT *Labs also have an affection for the ATS-6 and the following story tells why.* THE EDITOR



A typical dual frequency transmit terminal located atop the COMSAT Labs is in direct communication with the ATS-6. Labs engineer Jeffrey P. Steinhorn is at the terminal.

BY J. L. LEVATICH AND G. HYDE

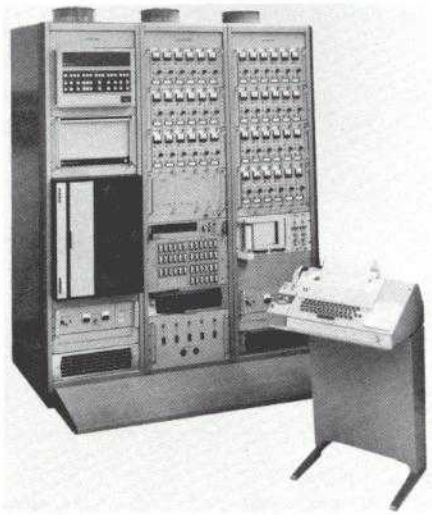
To COMSAT Laboratories, ATS-6 has a special significance, since it carries in synchronous orbit the first flight transponder ever designed, built and flight qualified at the Labs. The COMSAT Propagation Experiment has performed perfectly since it was placed in orbit. While the rest of the company was enjoying the COMSAT picnic at Smokey Glen Farms, a happy few at the ATS Operations Center at Goddard and in the old radome at the COMSAT Earth Station at Andover, Maine, were watching hopefully for signs of life. Precisely on schedule, the lights turned green on the carrier processors at Andover, and we all started to breathe again.

The experiment has since been gathering data on satellite signal attenuation, caused mostly by rain, at ground stations located in the several different U.S. climatological areas east of the Mississippi River. This data will be most useful in determining parameters needed for further spacecraft communications systems operating at frequencies above 10 GHz.

COMSAT Laboratories designed and supplied the equipment for this 13/18 GHz millimeter-wave propagation experiment. The principal elements of the experiment are transit terminals, a receive and data processing terminal, the flight transponder, and data reduction software and hardware.

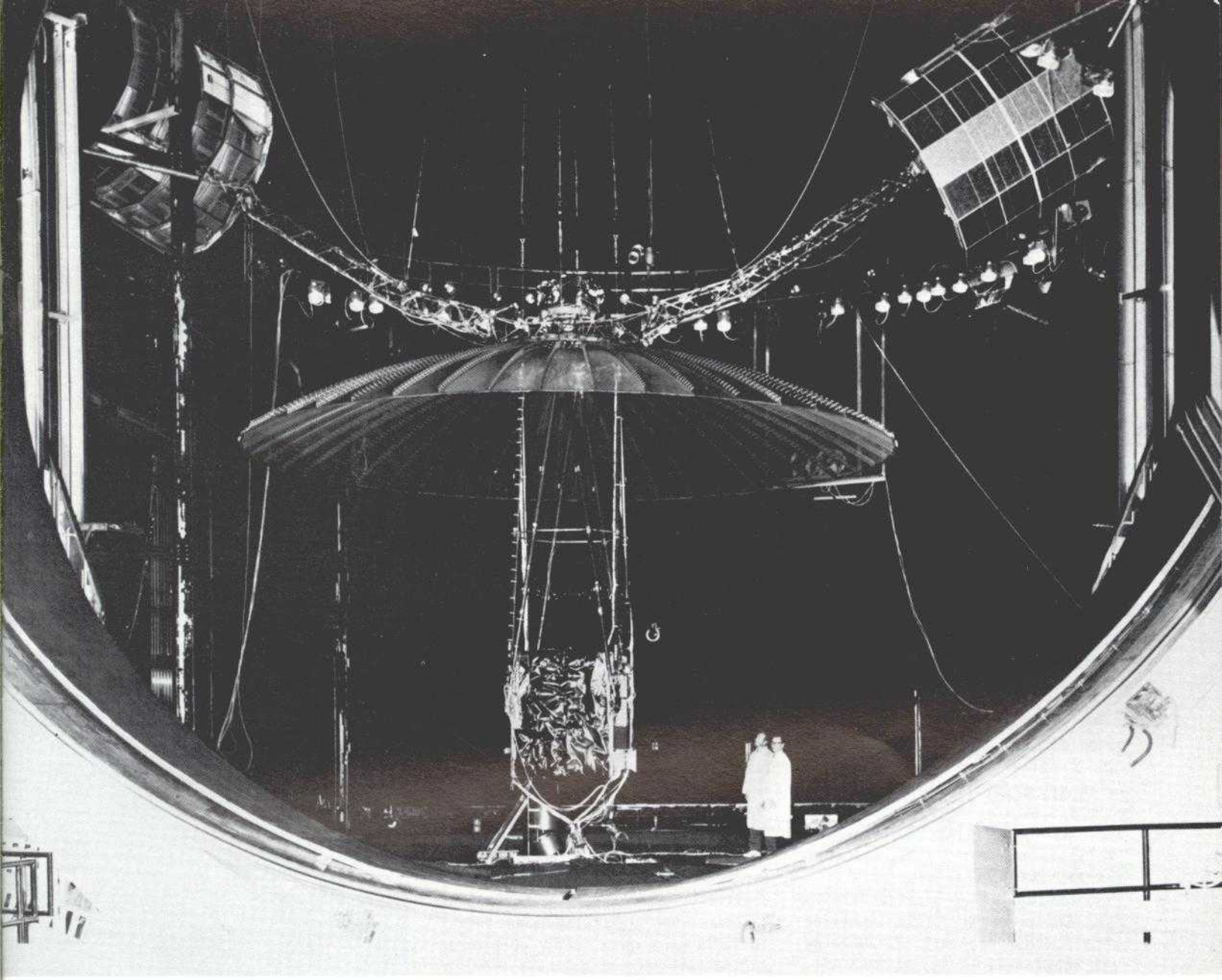
The transit terminals on the ground send a total of 40 carriers randomly staggered in the 13- and 18-GHz bands. The transponder in the ATS-6 spacecraft receives signals from the transmit terminals, translates them to approximately 4.15 GHz, and then retransmits them to the receive terminal and data acquisition system equipment, located at Andover. This facility receives the 4-GHz signals, separates out the individual carriers, and records the carrier power levels for data reduction and analysis. The data reduction and analysis are performed at COMSAT Laboratories in Clarksburg, Maryland.

Fifteen dual-frequency transmit terminals which transmit signals in the 13- and 18-GHz bands are located throughout the eastern half of the United States, spaced at least 100 miles apart. In addition, there are 9 diversity transmit terminals which send signals in the 18-GHz band. Three diversity terminals, separated



Receive and data processing terminals located at Andover, Maine, receiving transmissions over 40 carriers from the satellite.

Mr. Levatich is Manager, Development Applications, and Dr. Hyde is Manager, Propagation Studies, COMSAT *Labs.*



A test model of the Applications Technology Satellite (ATS-6), which carries the COMSAT Labs transponder used in the propagation experiment, during a high-vacuum chamber checkout at the Johnson Space Center in Houston. The one-and-a-half-ton satellite features a 30-foot diameter, umbrella-shaped antenna and 54-foot-span solar array "paddles" for generating its own electrical power. In addition to the Labs experiment the satellite will be used for educational TV by both the United States and the Indian Government and will play a crucial communications role in the July American-Russian manned flight. NASA PHOTO

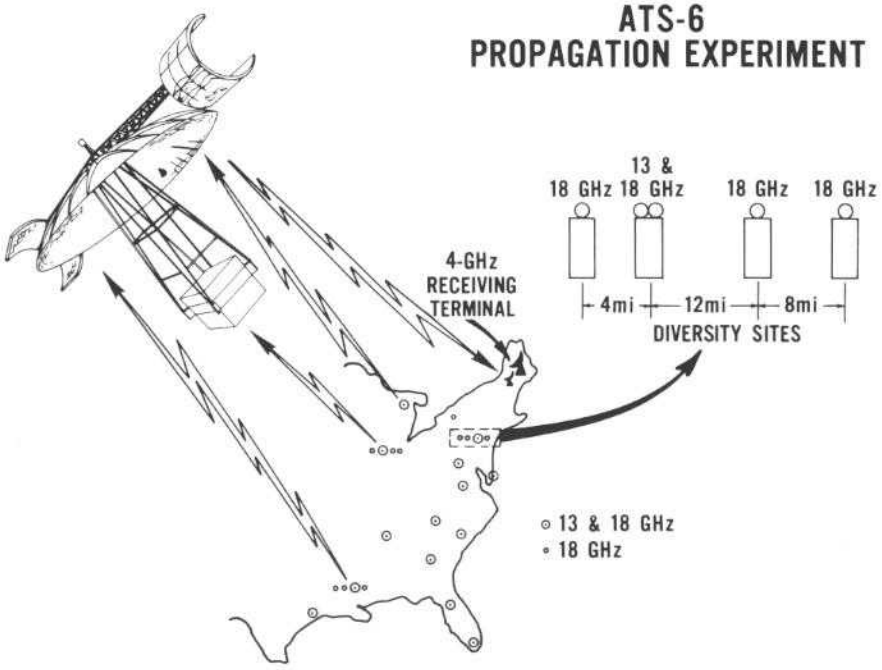
by less than 25 miles, are grouped around each of three dual-frequency terminals.

The transmit terminals consist of a parabolic-reflector-type antenna (positioned manually), a power amplifier and a frequency generator for each frequency, a power monitoring system, a rain gauge, a stripchart recorder, and an auxiliary power system.

The transponder is a single-frequency conversion repeater with separate inputs at 13 and 18 GHz. Its combined outputs are amplified and retransmitted in two 10-MHz bands near 4.155 GHz. The transponder consists of redundant 13- and 18-GHz frequency translators, two bandpass filters, a combiner hybrid, two three-stage tunnel diode amplifiers, and two traveling wave tube amplifiers.

The receive terminal, consisting of an antenna, a low-noise amplifier, a calibration unit, and a down-converter unit, receives, amplifies, and converts the 40 signals to the 70-MHz range. The forty 70-MHz signals are processed through individual carrier processors and converted to DC voltages, which are proportional to the input power of the received carrier signal. These signals are scanned, sampled, and applied to the data acquisition section, which calculates the power of each carrier signal and records it on magnetic tape. This procedure is completed for all 40 carriers once every second. These magnetic tape recordings can be processed on any large computer, but are being processed at COMSAT Laboratories on the IBM 360/65 computer facility.

Programs have been developed to eliminate the effects of satellite position motion (diurnal variations due to orbit inclination) and satellite attitude changes required by other experi-



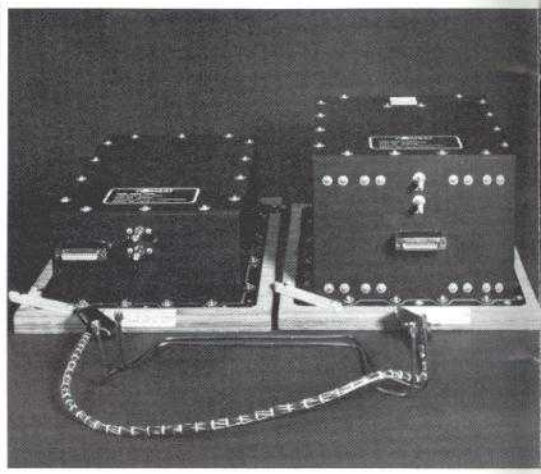
Propagation experiment system line drawing showing transmit and receive terminal locations collecting data from NASA's ATS-6 satellite.

ments on board the ATS-6. The corrected data are then processed to provide a statistical comparison between the measured attenuation at a site and general meteorological parameters such as rainfall rate, number of thunderstorm days, total precipitation, and the effects of diversity.

In addition to the planned benefits from the propagation data gathered as part of this project, which is being done under NASA contract NAS5-21610, there accrued numerous other benefits for COMSAT. As part of their successful efforts to build flight qualified hardware for the first time, the Labs gained experience in working with space qualified hardware, and established all the necessary functions for building and testing flight experiments. The reliability and quality assurance functions were strengthened, more rigid inspection procedures were established, a clean room was set up for assembling flight hardware, and experience was gained in rigorous environmental testing. In addition, new reporting and management control procedures were introduced to handle such programs.

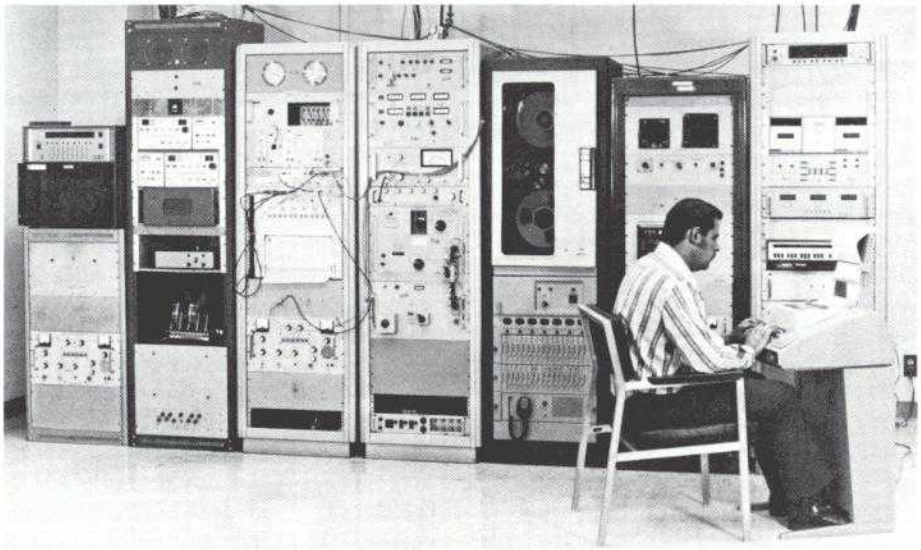
The success of this project is due to the efforts of persons too numerous to mention, since at the peak of the work as many as 50 individuals were contributing.

COMSAT Laboratories is also participating in another propagation experiment on board the ATS-6 satellite. This work is the Long Base Line of the 20/30 GHz-Millimeter Wave Propagation Experiment. Here COMSAT Labs has joined with NASA/Goddard Space Flight Center, Naval Research Labs at Waldorf, Maryland, and Westinghouse at Baltimore-Washington International Airport, to measure signal attenuation at 20 and/or 30 GHz and sky temperature along the same path from ATS-6, simultaneously, to provide not only the individual site statistics but diversity information for station separations of 20 to 50 miles. The precision 15-ft. antenna and propagation receive terminal on the roof of the Labs are being used to perform these measurements. The data from these measurements will provide the first earth/satellite signal attentuation measurements at the 20/30-GHz bands.



The flight transponder installed by the Labs on the ATS-6 for conducting the propagation experiment.

Lab technician Peter D. Ackerman monitors receiving terminal for the 20/30-Ghz long-base-line diversity experiment located at the Labs.



Consultants study proposed permanent INTELSAT Management Arrangements

INTELSAT has signed contracts with three professional management consultants from Australia, the United Kingdom and the United States to conduct studies and report on proposed permanent management arrangements for the Organization.

The reports, to be completed by 31 October 1975, are a requirement of the INTELSAT Agreements and are intended to provide information necessary for the determination of the most efficient and effective permanent management arrangements for INTELSAT, consistent with its basic aims and purposes, its international character and its obligation to provide on a commercial basis telecommunication facilities of high quality and reliability. The three consulting firms are: W. D. Scott & Company Pty., Limited, of Australia; PA International Management Consultants Limited, of the United Kingdom; and Booz, Allen & Hamilton, Inc., of the United States.

The INTELSAT Definitive Agreements, effective February 12, 1973, superseding interim agreements that had been in effect since August 20, 1964, stipulate that permanent management arrangements are to be fully implemented by the Organization not later than the end of the sixth year after the effective date of the Agreements, February 11, 1979.

During the transitional period a range of technical and operational management functions are performed by COMSAT under a Management Services Contract signed on August 1, 1974, and remaining in effect until February 11, 1979. The remaining management functions are performed by the INTELSAT Executive Organ, headed by a Secretary General until December 31, 1976, at which time INTELSAT will appoint a Director General to be responsible for all management functions, including those of the Management Services Contractor.

The Agreements require that, during the transitional period, the Board of Governors of INTELSAT conduct a permanent management arrangements study by not less than three professional management consultants selected by the Board from various parts of the world. The Board's study will also take into consideration the organization and procedures adopted by a number of other international telecommunications entities and multinational ventures implementing advanced technologies.

In accordance with the Agreements, the Board of Governors is to submit to the INTELSAT Assembly of Parties a comprehensive report no later than February 11, 1977, incorporating the results of its study, and to include its recommendations for the organizational structure of the Executive Organ.

AEROSAT office opened in Noordwijk, Holland

An initial contingent of COMSAT GENERAL Corporation technical and administrative personnel has been assigned to a joint project office in Holland to begin work on the aeronautical satellite communications program, AEROSAT.

The office, known as the AEROSAT Space Segment Program Office, opened in March. It will be staffed by personnel from the European Space Research Organization (ESRO) and the Government of Canada, as well as by COMSAT GENERAL. The office is located at the European Space Technology Center in Noordwijk, Holland.

AEROSAT is a joint intergovernmental program involving the Federal Aviation Administration (FAA), ESRO and Canada to test and evaluate the use of satellites to provide communications to aircraft flying transatlantic routes.

COMSAT GENERAL was selected last September as the U.S. company to participate with ESRO and Canada in establishing and operating the space segment—two in-orbit spacecraft and related ground control facilities and electronic equipment—for the program. The satellites are to be placed in stationary orbits over the Atlantic Ocean. COMSAT GENERAL will lease its share of satellite capacity to the FAA.

The Space Segment Program (SPO) in Holland has responsibility for administering the space segment portion of the AEROSAT Program. It plans to issue requests for proposals for the spacecraft this summer, and select a prime spacecraft contractor early in 1976. The first satellite is scheduled to be launched by December 1978.

Jean-Louis de Montlivault of France has been named Director of SPO. Leo M. Keane of COMSAT GENERAL is Deputy Director. COMSAT GENERAL plans to assign about 15 personnel to the Holland office this year.

In addition to the AEROSAT Program, COMSAT GENERAL is involved in a number of other major programs, including domestic satellite communications (COMSTAR I) and maritime satellite communications (MARISAT).

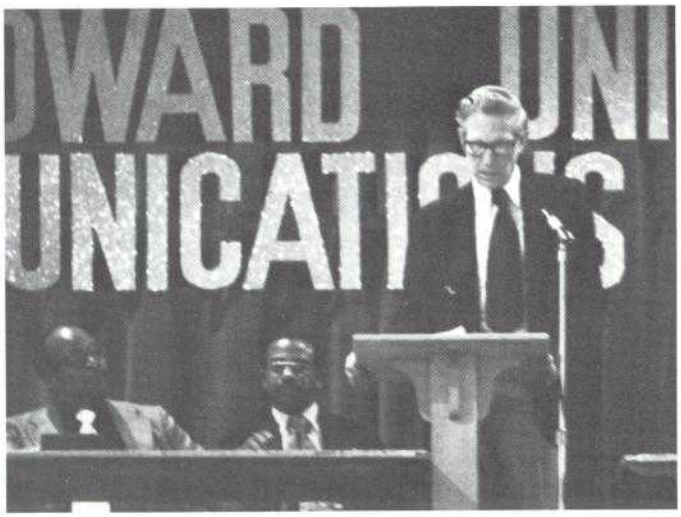
Dr. Edelson elected to AIAA Board

The American Institute of Aeronautics and Astronautics announced at its annual Business meeting the election of Assistant Vice President and Director of COMSAT Laboratories Burton I. Edelson to a three-year term on the AIAA Board of Directors.

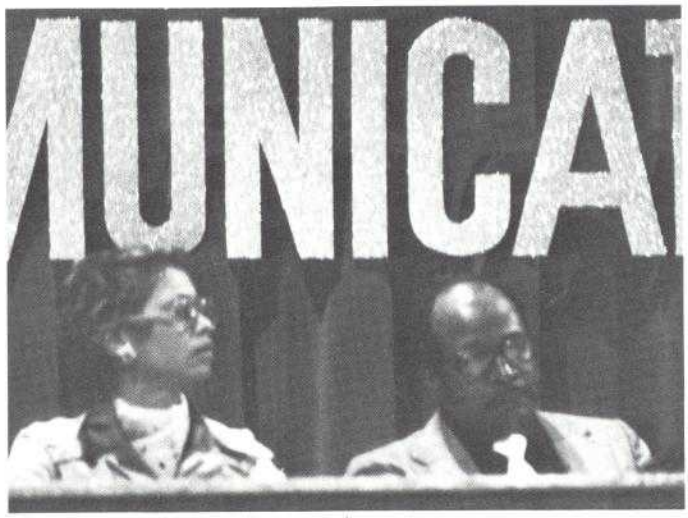
The Board supervises all activities technical, educational, U.S. regional, and international of the Institute. AIAA, with 30,000 members, is the leading U.S. technical professional society in aeronautics space technology and is the U.S. Member in the International Astronautics Federation.

Dr. Edelson was elected as a "technical director," representing scientific and engineering activities of the Institute. The other technical directors of AIAA are Professor Rene H. Miller of MIT; Dr. George E. Mueller, President of System Development Corporation; F. A. Cleveland, Vice President of Lockheed; William M. Magruder, Vice President of Piedmont Aviation; and Dr. Arthur Mager, Vice President of Aerospace Corporation.

COMSAT participates in fourth Howard University Communications Conference



George A. Tellman, Jr., Manager, U.S. System Operations, speaks at the Telecommunications session of the Howard University Conference on COMSAT's participation in domestic and international satellite programs. Seated at his right are FCC's Edward De Vaughn and Howard University's Early Monroe.



COMSAT Attorney Lorraine Eaves and Edward De Vaughn of the FCC's Common Carrier Bureau share the platform during the Fourth Annual Howard University Communications Conference.

Representatives of COMSAT participated in the Fourth Annual Howard University Communications Conference sponsored by the University. In addition to COMSAT panelists and speakers, members of the Federal Communications Commission played an active part in updating the student body on the latest information in the field of communications.

George A. Tellman, Jr., Manager, U.S. System Operations, addressed the telecommunications session on the subject, *Telecommunications: Entrepreneurs in the 21st Century*, and joined Howard Alumnus and COMSAT Attorney Lorraine Eaves in a panel discussion.

Other topics presented were: *Cable Television*, by Clay Smith, Deputy Chief of FCC's Cable Television Bureau; *New Technologies in Communications*, by Early Monroe, Howard University Department of Applied Communications; *International Broadcasting*, by Floyd Smith of U.S. Government International Representatives; *Television Ownership*, by Samuel Saady, Chief, Television Application Branch; *Common Carrier Service*, by Edward De Vaughn, Common Carrier Bureau, FCC; and *Data Services* by George Summers, DATA-DoT (Department of Transportation) Systems. Attorneys Brenda Irons and Derrick Humphries of the FCC's Cable TV Bureau also took part.

COMSAT participation in the Conference was coordinated by Personnel's William B. Lockett, Assistant Director of Personnel for Equal Employment Opportunity and Human Resources Development, and Brenda J. Lister, Training Administrator. The Conference was held at the University's Dumbarton Campus in Northwest Washington.

Labs supports Montgomery College Spring Exhibit

COMSAT Laboratories furnished an exhibit for display at the First Annual Montgomery College Spring Exhibit held at the college in mid-March. The invitation to participate was extended to COMSAT through Dr. Pier Bargellini, Labs Senior Scientist, a member of the Community College Advisory Committee, Engineering and Technologies.

The LABS exhibit featured a magnetically suspended momentum wheel depicting a future method of satellite stabilization using a "frictionless" momentum wheel. Dirk M. Vanderloo demonstrated the wheel's capabilities. The Office of Public Information provided a portable photographic display of the COMSAT-INTELSAT system.

In addition to the Labs exhibit there were others provided by Montgomery County "technology oriented" companies and government agencies. In addition to the college students, science classes from the county high schools were invited to view the exhibits.

Board of Governors directs preparation of alternative INTELSAT V design

INTELSAT IV (F-1) to be launched as soon as possible

Decisions on an alternative INTELSAT V design and the INTELSAT IV (F-1) launching were among those arrived at during the Fourteenth Meeting of the Board of Governors held recently in Washington, D.C. Twenty-one of the 22 Governors representing 52 Signatories attended the Meeting.

The following actions were among those taken by the Board:

Technical and Operational Matters

• Decided that the Alternative INTELSAT V will be the design used in further studies of various implementation plans. This design uses dual polarization to increase capacity at 6/4 GHz sufficiently to permit delayed introduction of service at 14/11 GHz, thus allowing additional time for the implementation of earth stations at this new frequency band.

• Directed the Management Services Contractor to proceed expeditiously with preparation of an RFP for an alternative INTELSAT V satellite. The advisory Committee on Technical Matters will review the RFP; the Management Services Contractor will make any revisions necessary and submit the final RFP for Board consideration in July.

• Directed the Management Services Contractor to complete its studies on the operational introduction of TDMA/DSI, and to examine as a matter of priority the implementation of TDMA/DSI using the alternative V. The application of FDMA/PSK/DSI in the INTELSAT IV-A system will also be studied, with priority emphasis on whether this technique could avoid or limit an Atlantic dual primary configuration from mid-1977 to mid-1979.

• Directed the Management Services Contractor to investigate the effect of different traffic diversity ratios in the space segment on the date and number of Atlantic earth stations, and to discuss with the Operations Representatives the means to initiate a three satellite configuration in the Atlantic Region, such as using the spare satellite with additional antennas which are available.

• Decided that the INTELSAT IV (F-1) be launched as soon as possible for service as the Indian Ocean Region operational satellite, at a nominal location of 61.4°E. If spacecraft tests are satisfactory, the INTELSAT IV (F-5) will be located nominally at 60°E for service as the spare; the INTELSAT III (F-3) will remain at 56.5° E for possible service as required.

• Authorized an amendment to the INTELSAT IV-A contract for installation of launch vibration instrumentation on all six spacecraft at a total price of $179,000.

• Authorized an amendment to the INTELSAT IV-A contract for installation of redundant microwave transistor amplifiers in three INTELSAT IV-A (F-1) receivers, and in all six receivers, if possible, of the remaining IV-A's at a maximum price of $975,000. If only three amplifiers can be installed in the IV-A (F-2) the total price will be $910,000.

• Provisionally approved the request of the Republic of Zaire for lease on a preemptible basis of an INTELSAT IV transponder in an Atlantic or Indian Ocean Region satellite. The lease was requested for a five-year period commencing in March, 1976, under the same terms and conditions as had been approved for Algeria. The approval is subject to the availability of adequate capacity, and a conclusion by the Management Services Contractor that the proposed lease would have no adverse technical and operational impact on the INTELSAT space segment.

• Approved the program for the flight test of a nickel-hydrogen battery on a U.S. Naval Research Laboratory experimental satellite, and authorized the addition of $50,000 to the 1975 R&D budget for purchase of the flight cells to be used in the test.

• Approved a revised application form for non-standard earth stations, and decided to review at a later date the policy on access by such stations and the approval procedures.

• Modified the existing approval of the small station at Cairo, Egypt, to include service through the Atlantic major path satellite to a standard station in France.

• Approved the Boa Vista and Manaus, Brazil, non-standard stations for operation in the leased transponder, subject to other TV services being provided at normal rates with no increase in power, and verification of the performance characteristics.

• Extended the existing approval of the U.S.N.S. Vanguard station for access to INTELSAT IV Pacific and Indian Ocean Region satellites, subject to: a rate adjustment factor of 5 for telephony services; no increase in satellite power for station operation at a lower than 30° elevation angle; and the provision that this shall not be a precedent for deviating from the policy of providing service in accordance with appropriate CCITT/CCIR recommendations.

Financial and Legal Matters

• Established a full-time space segment charge of $705 per month ($8,460 per year) effective 1 January 1975. The present charges for television, cable restoral, program data transmission, and other occasional uses will be retained.

• Approved a SPADE charge of $0.10 per minute of holding time, effective 1 March 1975, and decided that any further reduction in the

charge should be based on a review of all pertinent factors including the impact of charge reductions on the revenues from full-time preassigned circuits.

- Established an hourly rate of $72 for INTELSAT use of the thermal vacuum chamber at the COMSAT Laboratories.
- Approved a supplement of the 1975 budget of $453,000 to cover the contracts with three management consultants for studies of permanent management arrangements, and a contingency amount for Executive Organ administrative expenses.
- Decided that the royalty payment for use of the INTELSAT computer programs will be $40,000 per launch.

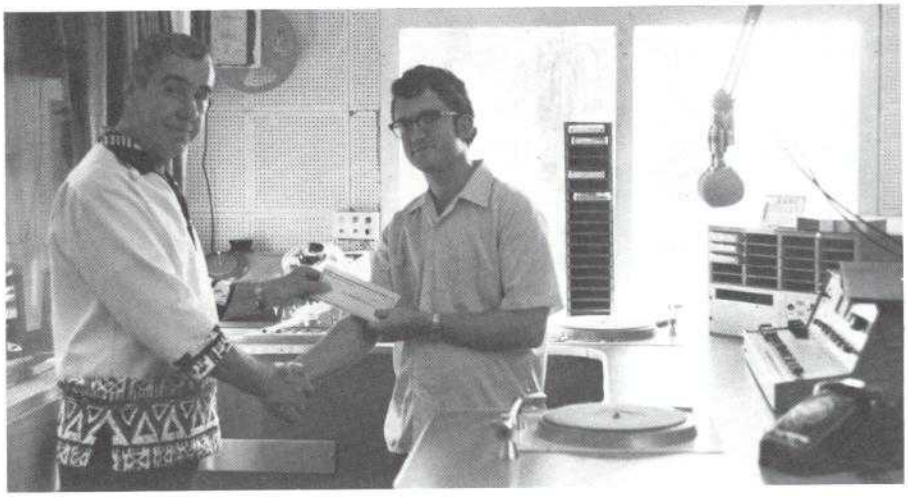
Administrative Matters

- Approved the reports which it must make to the Meeting of Signatories on the annual financial statements, annual report and report on future programs. The latter report does not request an increase in the capital ceiling at this time, but indicates that such a request will probably be made to the 1976 Meeting of Signatories.
- Decided to tender advice that Chile's domestic services under their leased transponder be considered on the same basis as international services, pursuant to Article III(b)(ii) of the Agreement. It will also report that a recommendation will be submitted to the 1976 Meeting on whether Zaire's domestic services should be classified as international traffic.
- Approved contracts with the three previously selected management consultants, W. D. Scott & Co. Pty. Ltd., Booz-Allen & Hamilton International Inc., and PA International Management Consultant Limited, to conduct studies on permanent management arrangements for INTELSAT. The consultants are to submit final written reports not later than October, 1975, and will make oral presentation to the Board at its December Meeting.

The **Fifteenth Meeting** will be held May 7-14 and the **Sixteenth Meeting** has been scheduled to begin July 9.

The preceding report was prepared by Ellen Hoff of the International Affairs Division.

COMSAT grant helps expansion of U of H radio coverage



Paumalu Earth Station Manager Glenn M. Vinquist, left, presents COMSAT's check to Ross W. Stephenson, General Manager of the University of Hawaii's Radio Station KTUH-FM.

A COMSAT grant of funds to the University of Hawaii's Radio Station KTUH-FM will, in the words of Ross W. Stephenson, General Manager, "... be used to erect a translator station atop Mt. Kaala in the Waianae Mountains and will enable KTUH-FM to expand its coverage to central Oahu and the difficult-to-reach North Shore area...."

The grant of funds was approved by the Corporate Charitable Contributions Committee in response to a request from the University of Hawaii. Paumalu Earth Station Manager Glenn M. Vinquist recommended favorable consideration by the Committee on the basis that the financial support would benefit the public by making it possible for the radio station to reach areas not currently served by the station.

The University's radio station listeners presently being served are centered mostly between Punchbowl and Hawaii-Kai on the main Island of Oahu, Kula and Makawao on the Island of Maui, Maunaloa on Molokai, and parts of Lanai.

According to Station Manager Stephenson the new translator will give KTUH at least 60,000 new potential listeners, allowing the station to cross the Island and enabling it to better serve the needs of the people in Hawaii.

A COMSAT shareholder, a resident of Hawaii, in a letter to President Joseph V. Charyk, cited several reasons why the request should be given serious consideration: the station is the only non-commercial station in Hawaii; the station has provided the means by which "hundreds of young people" have been given the chance to "break in" to the radio field; and its staff is made up of volunteers and must rely on donations of money and equipment to continue.

With world-famous Diamond Head providing the backdrop, Radio Station KTUH-FM's General Manager shows Earth Station Manager Vinquist the antenna which carries station programs into the main island of Oahu.

COMSAT Exhibit seen by thousands

Astronaut Gene Cernan escorts President Demetrio B. Lakas of Panama through the Johnson Space Center exhibit area in Houston, Texas.

Cattle breeders of the American Simmental Association of Montana show considerable interest in the COMSAT exhibit in the Visitors' Center at JSC, Houston.

Dear Dr. Charyk:

As you can see from the enclosed photograph, the COMSAT Exhibit you so graciously provided for display here at the Johnson Space Center is a favorite with our visitors. I am sure that most of the 750,000 visitors who toured the Center in 1974 saw and enjoyed the COMSAT display.

I want to thank you for your generous contribution to our public visitor program. During 1974 our visitors represented each of the 50 states and many foreign countries. The year of 1975 will certainly be an international year with the launch of Apollo Soyuz, and both domestic and foreign visitation is expected to exceed 1974.

Please convey my appreciation to everyone responsible for the design, development, and installation of the newest addition to the JSC Visitor Center.

Sincerely,
Christopher C. Kraft, Jr., Director
Johnson Space Center, Houston, Texas

All age brackets are fascinated by the story of the communications satellite system. More than three-quarters of a million visitors from all over the world view the Houston Space Center exhibits.

The button displayed prominently on the lapel of one of the visitors at the COMSAT exhibit proudly proclaims, "I'm from Montana."

PHOTOS BY J. PETERSON

Signatories meet in Montreal:

set minimum investment share; review INTELSAT V plans

The Meeting of Signatories set a minimum position for representation on the Board of Governors and reviewed planning for the INTELSAT V satellites at its Third Ordinary Meeting held in April in Montreal, Canada.

As host country to the Meeting, Canada celebrated the 25th anniversary of the Canadian Overseas Telecommunication Corporation (COTC) which is also the Canadian Signatory to INTELSAT.

Among several significant accomplishments concluded at the Meeting was the attempt to increase the opportunity for wider participation in the INTELSAT Board of Governors. The Signatories set a minimum position for representation on the Board at that of the 15th largest owner in the INTELSAT system. The 15th position is currently equivalent to an ownership share of 1.25 percent. Any Signatory or group of Signatories having this investment share would be entitled to representation on the Board of Governors.

The Signatories reviewed in detail current planning for a new generation of INTELSAT V satellites scheduled for deployment in the late 1970's. Planning studies indicate that the current capital ceiling for INTELSAT for capital payments and contractural commitments of up to $500 million will likely have to be increased at the Fourth Annual Meeting of Signatories in an amount ranging from $200 to $400 million.

It was also determined that Chilean domestic services would be considered on the same basis as international services, consequently, Chile will substantially increase its voting quota on the Board in future years.

Representatives to the Meeting of Signatories were welcomed to Canada by the Honorable Gerard Pelletier, Minister of Communications. In his remarks Mr. Pelletier stated that Canada, because of its geographical situation, was destined to be at the crossroads of telecommunications and noted the historical commitment of the Canadian people to participation in international telecommunications.

Elected officers of the Third Meeting were: Chairman, Jean Claude Delorme, Canadian Overseas Telecommunications Corporation; Deputy Chairman, B.A. Haffner, Nigerian External Telecommunications, Ltd.; Vice Chairman, C.L.P. Carrington, Cable & Wireless (West Indies), Ltd., Region A (Americas); Vice Chairman, M. Rodino, Societa Telespazio, Region B (Western Europe); Vice Chairman, M. Mohamed Bougara, Government of Democratic and Popular Republic of Algeria, Region D (Africa); and Vice Chairman, M.A. Motamedi, Imperial Government of Iran, Region E (Asia and Australia).

Mr. Jose Luis Alegrett of Venezuela, Chairman of the INTELSAT Board of Governors, paid tribute to COTC at the anniversary dinner. "INTELSAT continues to grow and prosper," said Alegrett, "and as we deploy larger and more sophisticated satellites we know we will have the technological and organizational vigor of COTC supporting us in maintaining our bold record of growth.

"As we plot the record of development of COTC in its first 25 years and of INTELSAT in its first 10 years, it is difficult to imagine how far we may progress by the time you are celebrating your fiftieth year and we are celebrating our thirty-fifth year's anniversary."

The highlight of the 25th anniversary dinner was the presentation of a sculpture, Totem 1, created by a noted Quebec artist, Clement Picard, to the INTELSAT International art collection. Mr. Delorme, President and General Manager of COTC, presented this sculpture, the winning piece in a contest among hundreds of Canadian artists, to Mr. Santiago Astrain, Secretary General of the INTELSAT organization. In accepting the work of art, Mr. Astrain noted that, "The comprehensive international membership of INTELSAT provides a unique opportunity to gather and display works of art which will depict the cultural heritage of the many societies comprising our community of nations."

The Signatories agreed that the Fourth, Fifth and Sixth Meetings will be held respectively in Singapore; Sydney, Australia; and Teheran, Iran.

INTELSAT Contract awards

To **Contraves A.G.** of Zurich, Switzerland, a 13-month, $150,000 contract to determine and demonstrate the weight saving and improved reliability and confidence of advanced materials for future primary spacecraft structures.

To **Hughes Research Laboratories** of Malibu, California, a 19-month, $139,979 contract for an improved GaAs FET Device Study.

To **Kokusai Denshin Denwa Company, Ltd.,** of Tokyo, Japan, a 19-month, $131,280 contract for a Space Diversity Synchronization and Switchover Study.

To **Hawker Siddeley, Ltd.,** of Hatfield, Herts, England, a 14-month, $103,000 contract for further development of a SS-TDMA, Low Power MOS/LSI System.

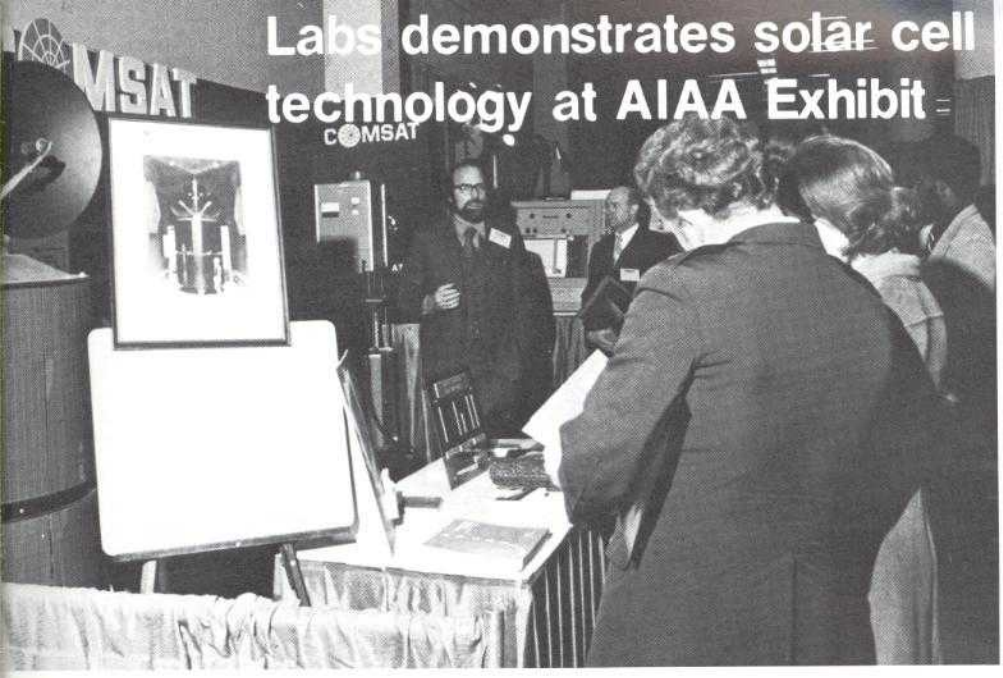
To **Atomic Energy Research Establishment** of Harwell, England, a 15-month, $95,000 contract for the study and development of materials to be used in the chemical storage of hydrogen in Ni-H_2 batteries.

To **Honeywell** of Minneapolis, a 12-month, $91,860 contract for a study on the application of gyroscopes for attitude reference.

To **International Telecommunications Development Corporation** of Taiwan, a 12-month, $60,000 contract for a series of cross polarization measurements.

To **Technical University Graz** of Austria, a 12-month, $11,270 contract for the operation of a Radiometric Receiving terminal.

Labs demonstrates solar cell technology at AIAA Exhibit



Andrew Meulenberg, Jr., briefs a group of visitors to the COMSAT display at the recent AIAA exhibit. The display featured advanced solar cell research conducted by the Labs' Applied Sciences Laboratory which led to the development of the Non-Reflective Cell. PHOTOS BY ALLAN GALFUND

A visitor to the COMSAT display discusses the performance of the advanced solar cells with Labs Technician Johann Tyler at the AIAA exhibit.

Comsat Labs demonstrated its pioneering efforts in solar cell technology with an exhibit at the 11th Annual Meeting and Technical Display of the American Institute of Aeronautics and Astronautics (AIAA) held recently at the Sheraton Park Hotel in Washington, D.C.

The Comsat display focused on the research carried on in the Applied Sciences Laboratory which led to the development of the Violet Cell (a 30% improvement over the conventional cell), and the Non-Reflective Cell (a 50% improvement over the conventional cell). The display featured an actual comparative demonstration of the increased performance of the new cells.

One solar cell of each of the non-reflective, violet and conventional types was exhibited. Equipment utilized in the laboratory to measure cell performance was brought from the Labs to the Comsat exhibit booth. The cells were illuminated by a filtered xenon arc lamp which was adjusted to simulate the intensity and spectral content of the sunlight reaching a satellite in geosynchronous orbit. In order to assure truly comparative results, all three cells were held at a constant 25° Celsius and current-voltage characteristic curves were plotted for each cell, utilizing an electronically variable load.

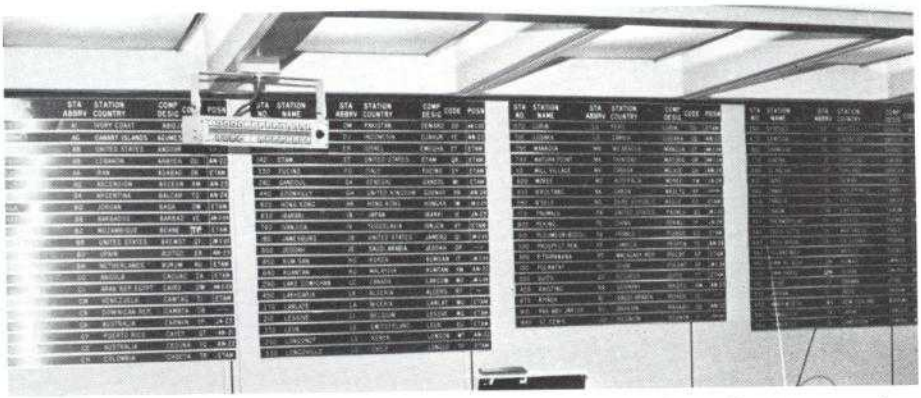
By all accounts, the demonstration was extremely successful with more than 2,000 visitors daily stopping by to observe and ask questions or to pick up some of the technical literature available from Comsat Labs personnel.

The demonstration was planned by Edmund S. Rittner, James F. Allison and Neil Helm. Labs personnel at the booth during the three day exhibition to greet visitors and answer questions were: Neil R. Helm, Johann Tyler, Mary Penrose, Andrew Meulenberg, Jr., and Allison. Allan Galfund coordinated the installation and related exhibit activities for the show.

Labs Technician Mary Penrose demonstrates equipment used to measure solar cell performance as Andrew Meulenberg, Jr., of the Labs briefs Senior Vice President Lucius D. Battle, Corporate Affairs, on the operation.

Neil R. Helm, Assistant Manager for Development Applications, COMSAT Labs, explains the advantages over previous solar cells of the Labs-developed Non-Reflective Cell during the recent AIAA exhibit at Washington's Sheraton Park Hotel.

They traffic in words: words by the millions



Earth station identification board provides Communications Center operators with, from left to right, station number, alphabetical listing, double-letter code, country in which located, computer designation, automatic acquisition code letters, and message transmission teletypewriter machine identification. Small panel at upper left of picture alerts duty operators to incoming messages by means of blinking lights.

The last issue of the COMSAT News contained a feature article on the Operations Center. The story on these pages provides a glimpse into an integral segment of the Ops Center, that segment responsible for the transmission and receipt of messages, the Communications Center. This series is an effort to familiarize Corporate employees with the many facets involved in "Operations."

PHOTOS AND STORY BY JOHN PETERSON

Messages going out of the Communications Center have a rather inauspicious beginning, a series of holes punched into a tape to be fed into the Transmitter Distributor. Not a very impressive statement.

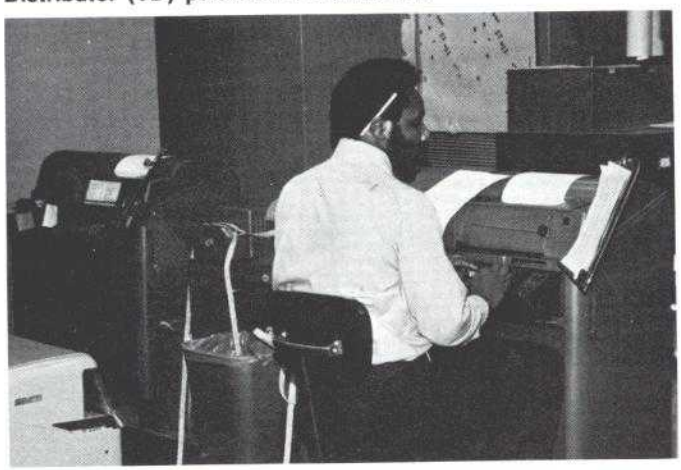
The reader might be more impressed if these perforations were translated into numbers of words. In a normal year the number of words transmitted to a station, or stations, in the global network would probably approximate 13 million.

If the reader is still not overly impressed with the amount of traffic originating in the Comm Center (we have not yet taken into consideration incoming traffic), perhaps he might if we were to take a year's accumulation of tape and stretch it out. If Operations Center Manager Lawrence W. Covert was to hold one end of the tape and stand on the Woodrow Wilson bridge crossing the Potomac River between Maryland and Virginia, and William P. Lawrence, the Comm Center's General Supervisor, started walking around the Capital Beltway trailing the tape behind him, he would not only have enough tape to completely encircle the Beltway, but still have enough remaining to allow him to wave at Covert as he went by and make a side trip to the Dulles International Airport—and still have some left over to bring back.

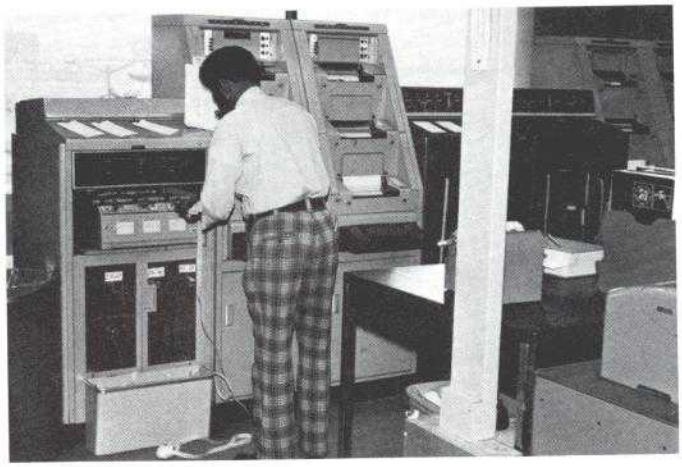
Now when you consider that the Capital Beltway has a perimeter in the neighborhood of 70 miles (and here I depend upon rough calculations computed from a roadmap), one must admit that these numbers represent a considerable amount of traffic transmitted. And the realization that any message marked "Urgent" can be received at any one of the far-flung earth stations in a matter of minutes, makes the Center's operation all the more impressive.

From December 1, 1974, through March 31, 1975, the Comm Center handled 5,589 outgoing messages

Royal Bailey, Communications Operator, prepares message for transmission. Printed copy emerges at top of teletypewriter while perforated tape to be fed into a Transmitter Distributor (TD) punches out at his left.

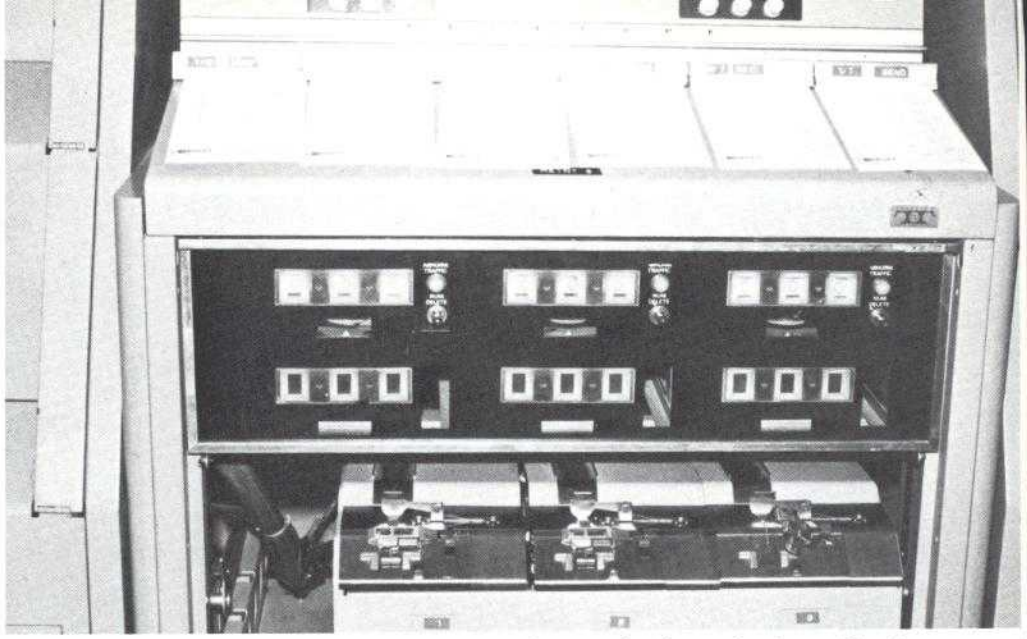


Don L. Early, Senior Communications Operator, feeds perforated tape into Transmitter Distributor prior to acquiring earth station for transmission of message.



Communications Center Staff

OPERATIONS CENTER MANAGER:
Lawrence W. Covert
COMMUNICATIONS SPECIALIST AND ACTING SUPERVISOR:
William P. Lawrence
COMMUNICATIONS SPECIALIST:
Matthew P. Cobert
SENIOR COMMUNICATIONS OPERATORS:
Marvin S. Breen
Gene A. Boyett
Don L. Early
COMMUNICATIONS OPERATORS:
Royal L. Bailey
Fredrick A. Graham
Alaric Joe
Fredrick A. Oester

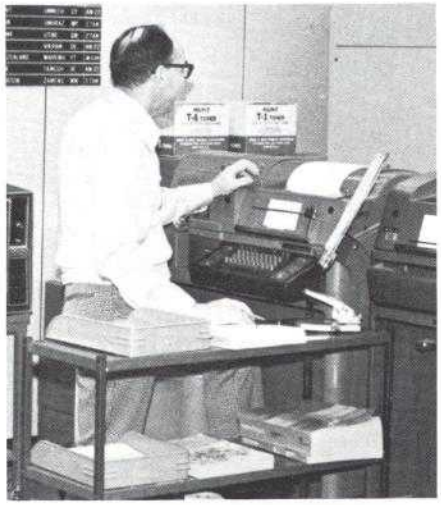


Transmitter-Distributor Bank provides the Communications Center with the capability of transmitting three messages simultaneously with each message destined for a separate earth station. Logs at the top record each message received and transmitted by the Center.

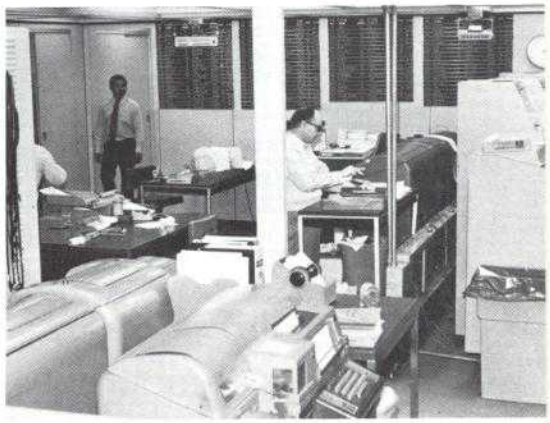
requiring 14,056 individual transmissions and 14,909 incoming messages. During this period the estimated word count handled was: 2,473,000 words transmitted and 2,323,400 received. An additional 3,906 tracking data messages were transmitted totaling approximately 2,142,000 words.

A staff of nine specialists and operators man the Center on an around-the-clock schedule. Two operators are normally on duty during the day and early evening hours of the weekdays with one operator present at all other times. In addition to their other qualifications Center staffers must have had teletypewriter experience and the ability to type a minimum of 40 words per minute.

Mr. Peterson is Editor of the COMSAT News

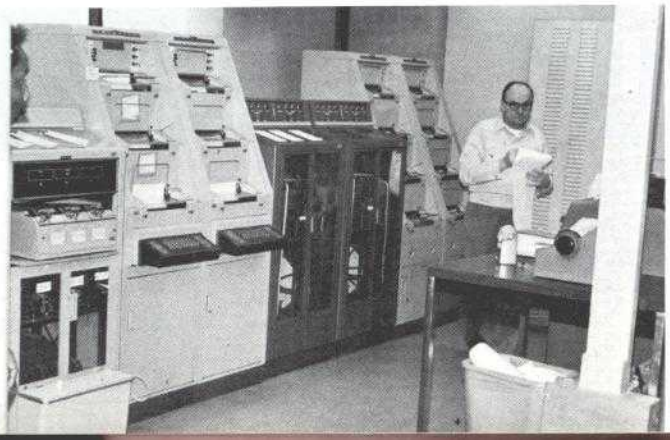


Matthew P. Cobert, Staff Communications Specialist, sends messages on the local loop received from earth stations and by Telex to divisions concerned on the third and sixth floors of COMSAT Headquarters.

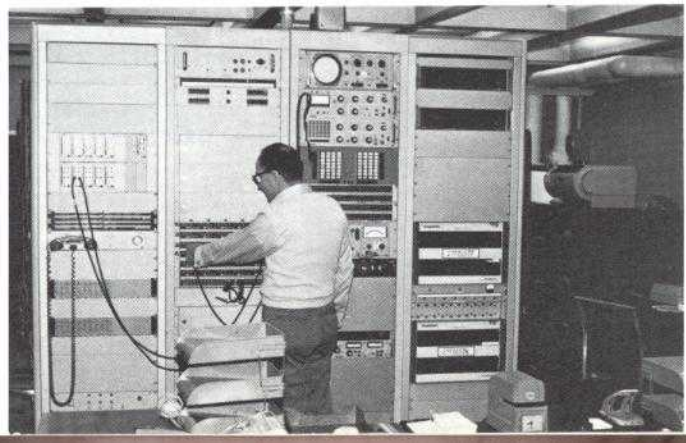


View of the teletypewriter area of the Center. Machines at left are the Automatic Send and Receive machines (ASR's). Group at right includes reperforator bank for converting received signals into tape and stacked page printers used with reperforator banks for receiving and transmitting printed messages.

A frontal view of the reperforator banks and the stacked page printers.



The Communication Center's teletypewriter patch panel allows duty operators to patch in alternate teletypewriter machines and the INTELSAT Operations center teletypewriter to any earth station it chooses for direct communications. Panel is also used for retrieving satellite pointing data from the Clarksburg, Md., computer.



Race against death

Women borrows $7,000 in a week to send neighbor to only surgeon in world who could save her.

REPRINTED FROM
THE NATIONAL ENQUIRER

Mary Mylecraine is alive today only because a neighbor, a former COMSAT employee, moved heaven and earth to send the dying woman to Switzerland and the only surgeon in the world who could save her life.

"It's a miracle!" says Mary, 49, now free of death-dealing tumors that once restricted her movements and were draining away her life.

She owes that miracle to Carolyn Dredge—a casual acquaintance who found a ray of hope for Mary and doggedly followed it until she got the $10,000 needed for the surgery—battling along the way insurance men, bankers and a time clock that was fast running out.

Last April, Mary—once a leading harpist—asked Carolyn, 32, to help buy a grave plot and make funeral arrangements.

She'd been told by her doctor 17 years before that she had progressive von Hippel-Lindau disease—inoperable brain tumors that would eventually kill her. Now Mary's progressive disability had forced her to quit work.

Carolyn, who lived several blocks from Mary in Arlington, Va., helped Mary get her financial affairs in order. Soon, Mary—a divorcee with a grown daughter and two teenagers—checked into the hospital for her final days of life.

But in July, Dr. Leo Goldhammer, a neuropsychiatrist, saw a glimmer of hope for Mary, though her condition was rapidly worsening. "He told me of a doctor in Switzerland who might be able to remove all the tumors," Carolyn recalled.

"I learned this surgeon, Dr. Yasargil of Zurich, had had considerable success with microsurgery on brain tumors—tumors which would have been called inoperable by other neurosurgeons. But the total cost of the operation and trip for Mary and a companion would probably be about $10,000."

After some argument, Mary's insurance carrier finally agreed to pay all surgical and hospital fees—but only after the operation was completed.

"The only thing to do was borrow the money, then pay it back after the insurance comes through," said Carolyn. "Neither Mary nor anyone else in her family had that kind of money. I didn't know where we could get it." Carolyn went to Mary's relatives and former associates, plus the local Lions and Kiwanis Clubs, and eventually came up with $2,500 in donations.

Then she went to two banks pleading for a loan and "got turned down cold."

"By this time, we had gotten word from Dr. Yasargil that he would take Mary's case, and I'd committed us to leave for Zurich on October 10. I had only about a week to get the money we needed."

Finally, Carolyn went to a local trust company, which agreed to lend her $6,000—with her husband's stocks as security. "I told my husband Talbot what had to be done. He just asked, 'Do you think this is the thing to do?' I said that Mary had to have her chance—so he signed.

"I put up our savings account book as security for another $1,000—and two days before Mary was due to fly to Zurich, we had about $10,000."

Though Carolyn hadn't planned to fly with Mary, she ended up accompanying her. As soon as they'd reached the hospital in Zurich, Mary was put into intensive care and then had surgery.

Three weeks later, Mary was recovering, back under the care of Dr. Goldhammer at Fairfax Hospital in Falls Church, Va. "We cannot expect 100 percent recovery of all physical and mental functions," Dr. Goldhammer said, "But it is remarkable how much Mrs. Mylecraine has already improved. She will soon be walking again."

The story ended happily for Carolyn too—on January 28, Mary received her money from the insurance company and promptly repaid Carolyn the full amount, except for $297.50 for blood costs, which will be paid later.

Mary, optimistic now, blesses the day she met Carolyn. "Carolyn is one in a million!" she said. "I don't know how I was so lucky to meet her. It's a miracle, isn't it?"

Patent incentive awards to nine at Labs

Receiving Patent Incentive Awards from Dr. B. I. Edelson, Director, COMSAT Labs, are (seated, left to right): Arthur F. Standing and Norman P. Miller; (standing, left to right): Joseph F. Stockel, Dr. Edelson, James D. Dunlop, Ronald K. Garlow, Russell J. F. Fang, Gerrit G. Van Ommering and Edmund S. Rittner. Award recipient Ali E. Atia is not shown in the photo.

Western Europe Parliamentarians visit COMSAT

Parliamentarians of the Scientific, Technological and Aerospace Committee, Assembly of Western European Union, visited the United States recently in response to the invitation from Senator Frank E. Moss, Chairman of the Aeronautical and Space Sciences Committee. Arranged by the Department of State with the cooperation of the Senate Committee, the purpose of their visit was to promote better understanding and closer European-American relations on aerospace matters. In addition to the National Aeronautics and Space Administration and the Department of Defense, the Parliamentarians also toured COMSAT.

Lack of interest threatens participation in youth program

Though considered an effective program, one supported financially for several years by COMSAT, consideration is being given to the possible discontinuance of COMSAT support to the Metropolitan Washington Junior Achievement Program, "unless we can develop employee interest in supporting and working with a Junior Achievement Company," said David S. Nye, Director of Personnel.

The Junior Achievement Program, active in the Washington area for the past decade, is an international business education program in which high school students organize and manage their own small-scale companies under the guidance of adult advisers from business and industry.

Junior Achievement companies are organized each fall as miniature corporations with their own boards of directors, work forces, sales staff, elected officers, etc. A company, usually composed of 20 students, chooses a business, either manufacturing or service, sets up production lines and plans distribution. Stock is sold to parents, friends, relatives, neighbors, teachers and the general public at $1 per share.

Management and the work force of the mini-company are paid salaries and wages, usually about 25 cents per hour. Salesmen get commissions. Company books and records are kept, rent is paid for the work space and equipment and machinery. Local and state taxes, where applicable, are paid, as is a special "profits tax," figured upon net income over the first $25.

The Junior Achievement companies—according to the Board of Trade News there are now 63 in business in the Washington area—are organized each fall and liquidated each spring with the appropriate filing of annual reports. Each company has an advisor, drawn from the area's private sector, who helps get things underway in the fall and keeps an eye on the two-hour, once-a-week business. The company stays in business for 30 weeks.

Company products range from lamps, children's toys, house number signs, furniture, barbecue stands, scarves, etc., to handmade chess sets and automobile "trouble lights."

Corporate employees interested in becoming involved in participating in the Junior Achievement program should contact Personnel's James R. Dunn or, at the Labs, L. O. Russell.

Audience with the King, a look at eastern culture highlight Governors' Meeting in Bangkok

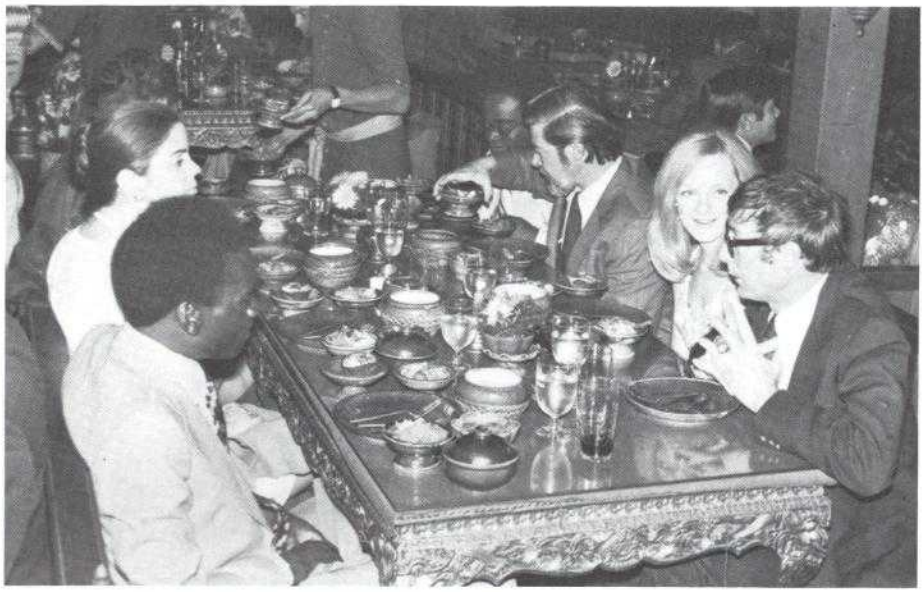
BY BETTY W. FIELD

The Thirteenth Meeting of the Board of Governors was held in the exotic storyland of Siam. Thailand is a curious mixture of East/West culture and the one national trait that is so pleasant is the Thai's happy disposition.

Our hosts, the employees of Post and Telegraph Department, were such charming and accommodating people that we were made to feel like royalty. Each person, upon arrival, was greeted with a Thai lei and escorted into a lounge and served refreshments while waiting to clear customs, then whisked, in a shiny new Mercedes, to a superb Bangkok Hotel, the Dusit Thani. Checking into our rooms, we found that our hosts had left a welcoming gift consisting of a Thai beverage and a basket of exotic fruits.

The meeting opened on Wednesday with an address by Mr. S. Sukhanetr, the Deputy Minister of Communications. So work began in very pleasant surroundings, the offices being located around a pool.

On the first evening of the meeting the Deputy Minister and Mrs. Sukhanetr hosted a reception/dinner at the Baan Thai restaurant. Buses transported us to an ordinary looking part of town where we walked down an ordinary looking alley to an extraordinary looking restaurant. Cocktails were served in the garden alongside a pond and dancers performed the traditional dances.



Representatives and staff members were introduced to Thai cuisine at a welcoming dinner. Seated around the table beginning at the extreme left (head partially obscured) are: Randy Payne, Alternate Governor, Australia; Ellen D. Hoff, Assistant to the U.S. Governor; Pascal Mukasa, Africa Group I; Robert W. Kinzie and Linda K. Paradine, Management Services Contractor; Emeric I. Podraczky, INTELSAT Executive Organ; and Aka Bonni, Governor, Africa Group II.

Inside we were seated on cushions at low tables in a lovely gold and red atmosphere and were served a seven-course dinner which included fish paste in lotus leaves, sweet and sour pork, chicken curry, ginger vermicelli and dried bean sprouts, fresh fruit and a rice confection in a lotus leaf. Delicious!! During dessert and coffee many dances were performed, one of which was a comical story of the monkey and the mermaid. The monkey dancer, wearing a grotesque but colorful costume, chased the beautiful mermaid all over the stage and even among the guests. The story ends happily with marriage and many offspring.

On the week-end, the Post and Telegraph Department chartered planes to take us to Chiang Mai, an ancient city about 300 miles north of Bangkok. Even the nasty, cloudy weather in Chiang Mai couldn't dampen our enthusiasm for what we saw. We first went to Laddaland and

The Candle Dance was performed for participants in the 13th Board Meeting by students of The Fine Arts Department of the University of Chiang Mai.

watched hill country dancers in an outdoor theater-in-the-round, then back to the hotel for a fabulous buffet luncheon. We were told then that the Deputy Minister had arranged an audience with the King, so, after lunch we loaded into buses and made the steep twisting climb up the mountain to the winter palace. We gathered in a reception hall and after a brief wait the King arrived. The Deputy Minister greeted the King in his native tongue, then, Mr. Alegrett, as Chairman of the Board, greeted His Majesty in Spanish which Mr. Van Reigersburg translated into English.

The King made his reply in English. After shaking hands with the Governors, tea was served, which was not just tea but a splendid array of artistically done delicacies.

Mr. Alegrett, sitting at the same table as the King, tells that he took one delicious looking morsel simply because the King had taken seven of the same so Mr. Alegrett logically assumed this morsel to be the best. Western palates are unaccustomed to the unusual tastes of Thai food which Mr. Alegrett realized too late.

The visit to the Palace, the audience with the King, and the tea will be remembered as the highlight of the trip.

The weekend at Chiang Mai was a constant whirl of activity with fabulous food, beautiful girls dancing, and visits to the temples, the silk factory, umbrella village, the celadon (pottery) factory, the lacquerware factory and the downtown Chiang Mai shopping district. The more hale and hearty, even after a full day and evening activity, found energy to dance at "The Spot," the hotel discotheque.


ไทยรัฐ

สื่อสารดาวเทียม

January 11, 1975, Time 16.05. His Majesty The King together with their Royal Highnesses Princess Sirinthorn and Princess Chulaporn, granted audience to His Excellency Mr. Sribhumi Sukhanetr, The Deputy Minister of Communications, and the delegates and participants to the 13th INTELSAT Board of Governors Meeting on the occasion of the conference in Bangkok, at Bhubing Palace in Chiang Mai.

Back to Bangkok and work on Monday. On Wednesday night Mr. Thongma, the Acting Director General of Post and Telegraph, and Mrs. Thongma held a farewell party, dinner and dancing on the Oriental Queen, a small luxury ship that is kept docked at the Oriental Hotel. After the Thai style buffet and dancing, Mr. Thongma, an accomplished actor and dancer (having performed the monkey dance for us on a previous occasion) launched an amateur show by singing a Thai song, and calling on Mr. Caruso to sing an Italian song. From that point on, Mr. Caruso assumed the roll of master of ceremonies and called on each country represented to do its bit. The evening ended with everyone doing Thai style dancing. As we left the ship, each lady was given a long-stemmed rose.

The meeting ended Thursday and the exodus began with a fond goodbye to a fabled land of beautiful people.

Mrs. Field is in the International Management Services Division

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Mr. Pascal Mukasa, Alternate Governor, Africa Group I, masters Thai greeting.

At the welcoming dinner, the traditional Thai dance was presented.

Credit Union elects Board members

Credit Union President James H. Kilcoyne reports to a full house at the Eighth Annual Shareholders Meeting of the COMSAT Federal Credit Union.

Four incumbents and one new member were elected to the Board of Directors of the COMSAT Federal Credit Union at the Eighth Annual Meeting held in late March at the Plaza.

Reelected incumbents included W. K. Coulter, J.H. Kilcoyne, C. William Simms and Jacqueline Wakeling. The new member elected was John Capossela. Reelected as Credit Committee members were Aaron Coleman and Nora Williams.

In addition to the presentation of business, the almost 150 members present were addressed by Dr. Joseph V. Charyk who expressed pleasure at the consistent growth of the CFCU and the fine service it makes available to its members.

A.C. Walle reported as Chairman of the Credit Committee. James C. Lawson, Chairman of the Supervisory Committee, noted the annual review had been conducted by the National Credit Union Administration and the Federal Examiner's report showed no significant problems. Statistical charts and Credit Union data were distributed to attendees.

The election process consisted of two working groups headed by Theodore A. Gottry, Election Committee Chairman, and a Nominating Committee chaired by Edward N. Wright. Nine candidates were considered for the five Board vacancies with five candidates for the two Credit Committee positions.

Dr. Charyk, a Credit Union member, drew the name of the door prize winner. Mrs. Vi Sepper, a Centrex operator, won the $50 share certificate. The meeting was concluded with a reception for the newly elected officers and a buffet.

Welch joins COMSAT legal staff

Gerald Welch, Jr., has joined the Office of General Counsel as an attorney in the Commercial Division, according to an announcement by William H. Berman, General Counsel.

Mr. Welch comes to the Corporation from the Office of the General Counsel, Energy Research and Development Administration. He had previously been with various Government agencies including the U.S. Commission on Government Procurement, NASA and the Navy.

He holds a BS Degree in Industrial Engineering from Seattle University, a Juris Doctorate from Catholic University and is a candidate for an LLM from George Washington University.

Some days you just luck out . . ."

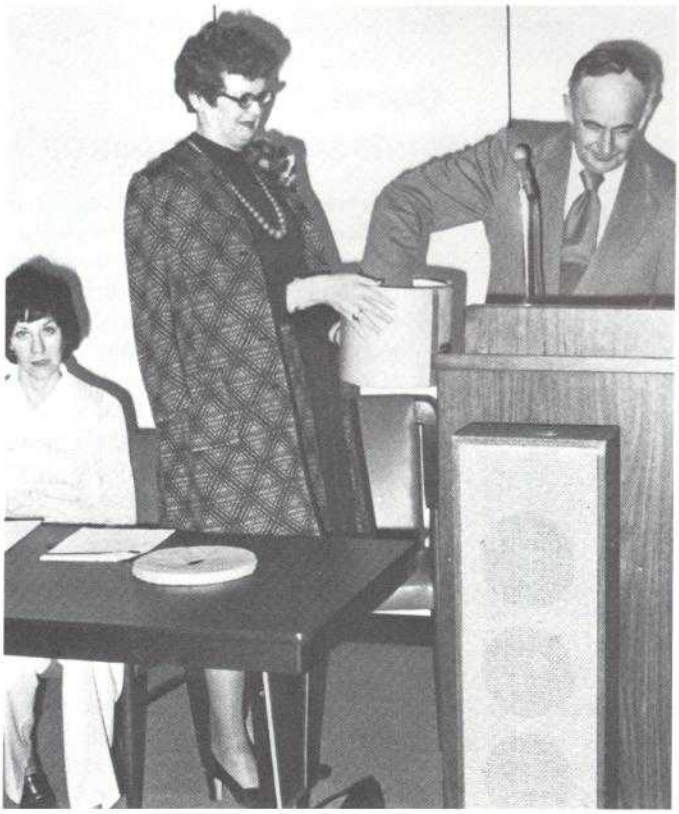
Each year, J.T. McKenna of the Information Office photographically records the Credit Union's Annual Shareholders Meeting. As usual, he started with a few random shots of registrants prior to the meeting. The accompanying pictures tell the story of JT's photographic "luck."

1. Vi Sepper, a Centrex operator and shareholder, registers . . .

2. drops her door prize ticket stub into a container . . .

3. sits quietly in the audience musing to herself, "I've never won a thing in my life," as Dr. Charyk, assisted by Jackie Wakeling, reaches for the winning ticket . . .

4. and is congratulated by COMSAT's President for winning the $50 share certificate as Credit Union Manager Marie Hixon looks on.



Eggers appointed Assistant General Counsel

David A. Eggers, Esq., has been appointed Assistant General Counsel of COMSAT GENERAL with primary responsibility for legal services required in connection with the procurement and other contract activities, according to an announcement by William D. English, Vice President and General Counsel, COMSAT GENERAL.

Prior to joining COMSAT GENERAL earlier this year he had been with the Office of General Counsel of COMSAT since August 1967 and had previously practiced law in Kansas City, Mo., and served on the legal staffs of various government agencies.

Mr. Eggers holds an AB in Political Science, an LLB from the University of Missouri and is a member of the Missouri Bar.

NBC's Neal gets Space Club Award

Dr. Joseph V. Charyk, left, presents the National Space Club's 1975 News Media Award to Roy Neal of NBC News at the Goddard Memorial Dinner. The Goddard Dinner is the top space social event of the Nation's Capital.

Hastings elected Space Club president

Larry G. Hastings, a COMSAT Senior Information Officer, was elected President of the National Space Club at its annual business meeting. Mr. Hastings has been a member of the Space Club since 1959. During that time, he served as chairman of the Goddard Commemorative Stamp Committee, assisting in the final design of the air mail stamp and preparing legislation for its approval.

Hastings also established the National Space Club News Media Award whose first recipient was the late Edward R. Murrow. The 1975 winner is Roy Neal, NBC-television's veteran aerospace and science reporter.

COMSAT's President Dr. Joseph V. Charyk is a member of the National Space Club's Board of Governors. Among the other Governors are the

Honorable Frank E. Moss, former astronaut Michael Collins, Mrs. Robert H. Goddard and the Honorable Olin E. Teague.

Hastings succeeds Fred E. Everett as President of the organization.

General Counsel announces changes

As a result of a reorganization of the Office of the Secretary, organizational changes have been made in COMSAT's Office of the General Counsel, according to William H. Berman.

James A. Amdur, formerly Assistant General Counsel, Tax and Administration, has been appointed Asistant General Counsel, Corporate and Tax Matters, with the responsibility for those matters involving corporation law and securities law formerly the responsibility of the Corporate Secretary. He will retain responsibility for matters involving tax law and for administration of the Office of the General Counsel.

Paul Weeks, II, formerly Attorney, Regulatory Matters, has been appointed Attorney, Corporate and Tax Matters, and will assist Mr. Amdur.

Davis promoted at Labs; gets letter of commendation

Robert C. Davis, formerly Manager, Communications Network Studies Department at COMSAT Laboratories, has been promoted to Director, Transmission Systems, according to an announcement by Dr. B. I. Edelson, LABS Director.

In his previous position, Davis has performed in-depth analyses of new INTELSAT transmission systems, particularly those employing TDMA and DSI. He has also led the work of COMSAT Labs in the development of concepts and techniques applicable to computer communications and networking via satellite.

Prior to joining COMSAT he had spent 23 years with International Telephone and Telegraph and Computer Sciences Corporation. He was recently awarded the Defense Department Letter of Commendation for his past work on computer communications networks.

The Letter of Commendation from the Defense Communications Agency cited Davis for his outstanding work on interoperable spread spectrum communications in support of the Worldwide Military Command and Control System, WWMCCS, while employed by the Computer Sciences Corporation.

In his letter to Dr. Edelson, Brig. Gen. John H. Jacobsmeyer, Jr., Director of Plans and Programs, commended him for his "invaluable technical expertise that led to the system definition of interoperability which affects all aspects of the DSCS Phase 11 Program and its various users". General Jacobsmeyer further stated, "Without his system concepts and solutions of numerous problems relating to this effort, interoperable spread spectrum communications could not be achieved."

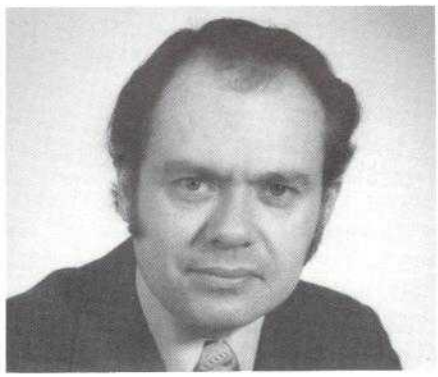
Davis is a graduate of Union College and M.I.T. and a member of the AIAA Technical Committee on Communications.

Robert C. Davis (right), recently promoted to Director, Transmission Systems, COMSAT Labs, receives Defense Department's Letter of Commendation from Dr. B. I. Edelson, Labs Director. The Commendation cited Davis for his past work on computer communications networks.

Completes Doctorate requirements

Denis J. Curtin, a member of the Spacecraft Laboratory at COMSAT Laboratories since 1967, has recently completed the requirements for the PhD degree in Mechanical Engineering at the Catholic University of America.

Dr. Curtin's dissertation is entitled *Heat Transfer Measurements of Confined Monatomic, Diatomic, and Triatomic Gases in the Transition Region*. The transition region occurs within an intermediate pressure range where the heat conduction in a gas is not a linear function of pressure, but where the value for the thermal conductivity is not as high as that observed at atmospheric pressure. Experiments and some theoretical work have helped to explain the heat transfer properties of different types of gas molecules in this pressure range. This work has possible applications in studies related to the outgassing of spacecraft components.



Dr. Gary Gordon, also from the Spacecraft Laboratory, served as an advisor and was a member of the dissertation committee. Dr. Curtin's course work had the support of the COMSAT educational assistance program.

Dr. Curtin, who has a BS degree in Physics from Iona College New Rochelle, New York, 1961, and an MS in Physics from the Catholic University of America, 1963, works in the area of solar cell and solar array technology. He is the author or co-author of several publications on radiation effects in solar cells and solar array technology.

Dr. Curtin is a member of the *COMSAT Technical Review* Editorial Board, AIAA, ASTM, Sigma Xi, and Sigma Pi Sigma. He is also a reviewer for the IEEE Transactions on Electron Devices and is the Conference Chairman for the 1975 IEEE Photovoltaic Specialists Conference.

Paumalu staffer's persistence pays off for COMSAT

Paumalu Earth Station Manager Glenn M. Vinquist, right, presents a Letter of Commendation to J.M. Chow for his persistence in following up on his belief that the station had been overcharged for power consumption, resulting in a refund to COMSAT of over $75,000 by the Hawaiian Electric Company. Senior Vice President George P. Sampson, International System Division, cited Chow for his perseverence and efforts on behalf of COMSAT.

New position, promotions announced by COMSAT GENERAL

Anthony A. Bergamini has been appointed to the newly-created position of Director, Financial Services, according to an announcement by Joseph H. O'Connor, Vice President-Treasurer, COMSAT GENERAL.

Prior to joining COMSAT GENERAL, Bergamini was Treasurer of American Satellite Corporation. From 1967 until 1973 he had been Corporate Comptroller of Western Union International, Inc.

Other administrative actions announced by O'Connor included the promotion of John Thaler to Director of Administrative Services, and John R. O'Brien to Manager, Procurement and Contracting.

Network Bits

ANDOVER. Joanne Witas, our Material Control Specialist, recently had a narrow escape from serious injury. She was involved in a head-on collision with another car while returning home from shopping. Her car was completely demolished but, fortunately, none of her four passengers required lengthy hospitalization. Joanne sustained a broken wrist and will not be back at work until June.

A safety program was presented to COMSAT and AT&T personnel and their wives by Larry Dillon of AT&T Long Lines, Springfield, Mass. A Medi-Train dummy was used to provide training in mouth-to-mouth and cardio-pulmonary resuscitation. Films were shown featuring ABC News clips demonstrating the flammability of household furnishings and building materials, particularly exposed polystyrene spray-on insulation. The films also demonstrated the flammability of clothing, the hazards of auto fires and inadequate fire protection in high-rise buildings.

With the weather starting to turn a little warmer and signs of snow melting, station personnel are now turning their thoughts toward summer activities. The bikers on station are breaking their motorcycles out of mothballs and doing pre-summer maintenance. **—Kenneth Dixon**

ETAM. There have been a few changes made in the Operations segment of our earth station: Senior Technician **Don Gaston** was promoted to Operations Supervisor and now oversees the activities of the Red Team, replacing **Gerry Reeves** who requested a transfer to the Electronics Maintenance Shop, his "old stomping grounds."

Rupe Hobbs, representing the Etam CEA, presented a Daniel Boone beverage bottle to Technician **Terry McCollough** before his final departure from Etam. Terry, who has transferred to COMSAT GENERAL'S Washington office, came to Etam from Headquarters early in 1973.

Russell Goines has joined the station staff as a new temporary Facilities Utility Man. Russell resides in Kingwood, West Virginia, with his wife and small son.

The Etam CEA sponsored a luncheon in the station canteen on 26 March for all members with "snack packs" prepared for the evening and mid-shifts. The menu, consisting of ham, beans, cheese, chips and an assortment of bread and buns, offers a pleasant change from the "brown bag" routine.

Construction of the Etam-2 antenna is progressing very slowly due to winter weather conditions and unforeseen mechanical problems. It appears now that it will be early summer before the antenna construction is complete. Some of the new equipment in support of the restoration program has begun to arrive on station, such as our two turbines and the uncooled low-noise receivers.

—Bev Conner

JAMESBURG. Les Phelps has assumed the position of Operations Supervisor of AT&T facilities at the Jamesburg Earth Station. He replaces **Frank Birney,** who had been local Manager since 1968 and has been reassigned to duties with the AT&T Long Lines Department in Phoenix, Arizona.

Terry McCollough, left, gets a going-away gift from Rupe Hobbs representing the Etam CEA and poses with a group of his co-workers prior to his departure for Washington.

Les has been with AT&T for a little over seven years, spending three years in Operations in Apache Junction, Arizona, and four years with the Engineering Department in San Francisco.

He is a native of Warrensburg, Missouri, and now resides with his wife, Sharon, and three sons, Chuck, Jim, and Brian, in Salinas, California. He and his family enjoy bowling and camping and he does admirably in strumming a guitar. **Sharon** was born in Wisconsin Rapids, Wisconsin, and they were married in Blackfoot, Idaho, in 1966. **—W. E. Neu**

LABS. The first sign of Spring has shown through at the Laboratories—the Gardens. All plots are now plowed and ready for planting. All we need is a little cooperation from "Mother Nature." The Garden Club officers and members have done a very fine job this year, and with a few "green thumbs" we should expect to see some very nice crops.

Congratulations are in order for several of the staff at the Labs for an assortment of reasons: The **Gene Carlsons** are the new parents of a son, **Glen Eugene,** who weighed in at seven pounds, 14 ounces on February 26 at Union Memorial Hospital in Baltimore. Six-pound, seven-ounce **David John Talbot,** son of **Jack** and **Gail Talbot,** was born December 25 at Holy Cross Hospital in Silver Spring. Congratulations are also in order for Dr. **Roger Taur** who celebrated Valentine's Day by becoming a United States citizen. **William W. Wu,** an Engineer in the Transmission Systems Division, completed his thesis in 1974 and will be graduated in May from Johns Hopkins University with a Ph.D. in Electrical Engineering. Spacecraft Division Engineer **Denis J. Curtin** has received his Ph.D. in Mechanical Engineering from Catholic University.

Spring vacations are on the agenda at the Laboratories and **Bob** and **Betty Mowen** recently took their annual Easter Vacation, going to Myrtle Beach, South Carolina. Labs Nurse **Betty** returned looking very tanned and vacationed after a week of relaxed camping in their home on wheels. The **Bill Fallons** spent a week in the Florida sun. After arrival on the Auto-train the **Fallons** ventured to Florida vacation spots, Cape Kennedy, Busch Gardens (Tampa) and last, but not least, the much populated Lake Buena Vista and Disney World.

It's that time of year again when we can see Johnny Bench, Carlson Fisk and even "what's-his-name" Aaron on the T.V. Not to be outdone, practice for COMSAT Labs Championship Softball team is in full swing. I am told by those in authority (the players) that we will again this year have a very strong team; especially if the "Rookie's" toe gets better after a recent operation. . .

COMSAT Laboratories 2nd Annual Invitational Softball Tournament is scheduled for May 31st and June 1st, starting early in the morning and running until late in the afternoon. Rain dates are scheduled for June 7 and 8. All you softball supporters come on out and pick a team. There will be eight teams from various organizations along the Interstate 270 Corridor, including our own COMSAT team. Plan to spend the day as there will be plenty to eat and drink.

For the second straight year COMSAT Labs Basketball team has won the Monday Night B-League Championship in the City of Gaithersburg Department of Parks and Recreation Basketball League. COMSAT remained unbeaten the entire season, playing teams from Bechtel Corporation, AEC, FDA, Comress and Bish Thompsons. Congratulations to all the players and to Managers **Pete Carlton** and **John Reisenweber** for their efforts. And a special thanks to those of you who came out and supported our team.

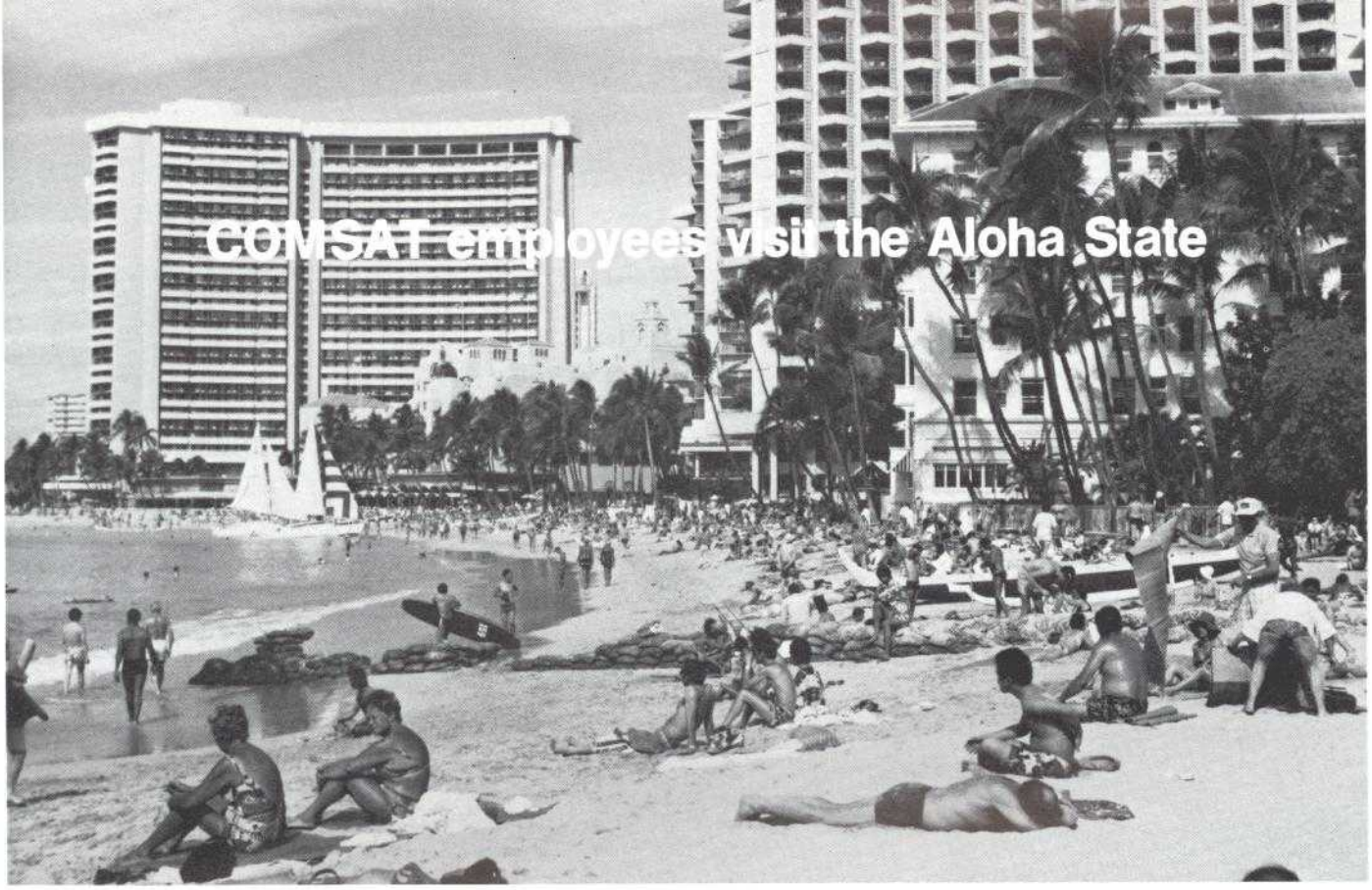
If you have news for the Labs portion of the COMSAT News, please give me a call, "Even a great writer needs Help." **—Carol Louthan**

PLAZA. Howard Reagan, Manager, Documentation and Procedures, U.S. Systems Management, and his wife, **Jan,** were a bit surprised recently when they answered a knock on the front door. Not so much surprised to see their friend, Mark Bowers, but to hear him request an emergency use of their electricity. It seems Mark was enroute home from playing golf when he ran out of electricity. He just backed his brand new red Elcar into the Reagans' yard and plugged it in. He couldn't have made it home otherwise. It was a great time to have a short visit, and soon the unusual event attracted some interested neighbors. He got a real charge out of it before heading merrily home.

The onset of warm weather brings with it the annual CEA social events. Make a note that the Spring Plaza Party will be held on May 16 and the Picnic will be held on June 8.

—Donna Higgs

COMSAT employees visit the Aloha State



Waikiki Beach, a haven for those seeking an escape from winter weather. More than 40 COMSAT employees and family members spent many hours on this Pacific Isle beach during mid-February.

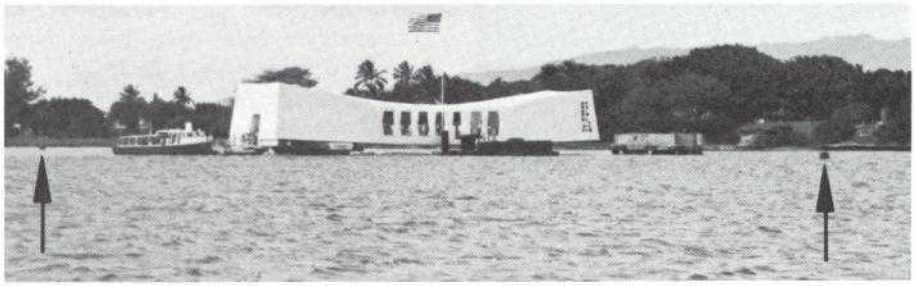
STORY AND PHOTOS BY J. T. MCKENNA

Over 40 employees and their families visited the Hawaiian Islands in mid-February leaving snow and cold weather behind for eight days of sun and fun.

American Airlines carried our group on the 12-hour direct flight from Washington to Honolulu. As the Boeing 707 jet left the ground that Monday morning the temperature was 18 degrees and damp.

The flight was rather tiring, but the greeting each of us received was worth the long hours spent on the aircraft. As we entered the airline terminal, a group of Islanders gave us the traditional Aloha greeting and a flower lei made of carnations. Outside the airport, motor coaches were waiting to take us to Waikiki and the Sheraton Kaiulani, our temporary home for eight days.

The first day in Waikiki was used by many to see the sights of neighboring Honolulu. Many took organized trips from tour directors Evelyn and Sherri of the Atkins and Mullen Tour Company, while those on a more stringent budget headed for the city bus, which takes you almost anywhere on the Island for a quarter.



The famed USS Arizona Memorial at Pearl Harbor. The Memorial is built perpendicular to the keel line of the ship which rests in 38 feet of water. The arrows mark the bow and stern of the ship sunk over 33 years ago.

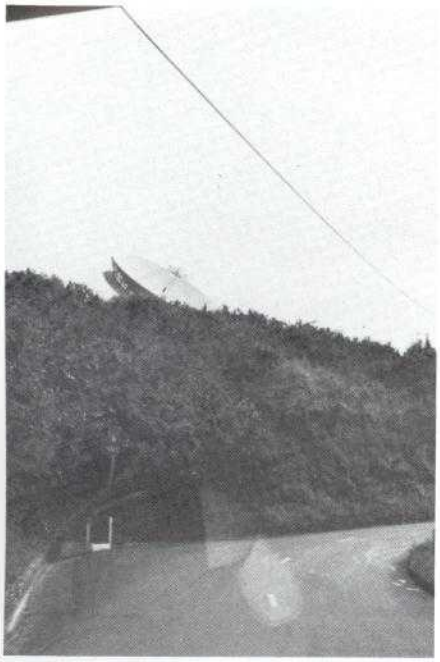
Each of us set his own itinerary and pace for seeing the sights. Tuesday morning several of us went to Pearl Harbor to see the famed USS Arizona. While the memorial itself is plain and simple, the sight of the ship below, and the fresh "slicks" made by oil bubbling from it, 33 years after the sinking, is an impressive sight to any visitor.

As evening approached, we headed back to Waikiki to see the first of many Hawaiian sunsets. Some watched this spectacular view from a terrace overlooking the beach, while others took the city-operated sea transit boat out toward Iroquois Point to see the setting sun and a beautiful panoramic view of the Waikiki shoreline.

Wednesday saw the group basking in the sun on the beaches near the hotel. The more adventuresome in our group rented surfboards and headed for the breakers. Most of us gave surfing a valiant effort, but few managed to stand with both feet on the board.

Nighttime plans were as varied as the Island itself. Some took in the Don Ho performance while others walked the beach in search of a free show from the rear of a hotel—like the voice of Emma Veary who performed on the patio of the Halekulani

Mr. McKenna is a COMSAT Information Officer



The huge communications antenna peers out over the horizon as the group winds its way up the access road to the Paumalu Earth Station.

Hotel, or the Polynesian Review at the Banyan Court of the Sheraton Moana.

Thursday had been set aside for a trip to the Paumalu earth station and a circle tour of Oahu. Arrangements for the tour were coordinated with Donald Greer, Headquarters Executive Officer, and Glenn Vinquist, Paumalu station manager. Bob Kumasaka, Paumalu station administrator, met our group at the hotel that morning and briefed us on what we would be seeing at the earth station and on the Island tour.

The first stop was at the Dole Pineapple Plantation, about 45 minutes outside of Honolulu. There were pineapples as far as the eye could see, but the sharp edges of the bush and on the fruit itself eliminated any second thoughts of picking one. At the nearby refreshment stand we each had a plate of fresh pineapple, courtesy of Glenn Vinquist.

Continuing toward the earth station, we made a brief stop at Sunset Beach for a few pictures and to observe the powerful surf. While some of us were admiring the scenery, others searched the sand for white puka shells used in making necklaces.

Winding our way up the access road to the earth station, we saw the huge white dish antenna peering over the horizon. Greeting our group at the top of the hill were Glenn Vinquist and Ken Yamashita, station engineer. After a briefing in the conference room, we went to the control room for an explanation of the functions of the equipment and station personnel. Then, amid the balmy breezes from the Pacific, we proceeded to the base of the 97-foot communications antenna for pictures. Many in the group wondered with sheer amazement at the massiveness of the antenna.

Luncheon arrangements had been made at the nearby Kuilima hotel by Bob Kumasaka. The Kuilima on the North Shore juts out into the Pacific Ocean and is used by a major television network as the site for a daytime quiz show called "The Diamond Head Game."

Following lunch, we visited the Polynesian Cultural Center, established by the Mormons to educate students from six Polynesian countries and territories in the ancient arts and cultures of their lands. Following their stay at the Center, the Polynesians return to their home land to share their cultural knowledge and education with other citizens.

At the Cultural Center, students explain their heritage and knowledge of Polynesian customs to the many visitors through demonstrations at six individual Polynesian villages. A very colorful pageant was held that afternoon, giving our group an opportunity to enjoy the dancing and music of the South Pacific Islands, including Hawaii, Tahiti, Samoa, and New Zealand.

The day was approaching an end as the sun began to set behind Diamond Head on our return to Waikiki. As the bus pulled up to the hotel entrance, we realized how enjoyable the day had been, thanks to the time and effort spent by the COMSAT personnel at Paumalu.

The remainder of the week was spent soaking up the Pacific sun during the day and relaxing in the evening around Waikiki or at the pool.

Armed with suntans, Aloha shirts, and other souvenirs, we left for the airport Monday evening for the long ride east.

When the plane touched down in Baltimore Tuesday morning, amid the fog, dampness and rain, we realized how great it was to have been in Hawaii.

Glenn Vinquist, Paumalu Earth Station Manager, briefs part of the group on the role of the facility in the global communications network.

Amid the balmy Pacific breezes, Bob Kumasaka (foreground), station administrator, takes the group to the base of the 97-foot station antenna.

There were many ways to make use of a surfboard on Waikiki as (left to right) Linda Kortbawi, Claire Koenig and Harriett Biddle demonstrate.

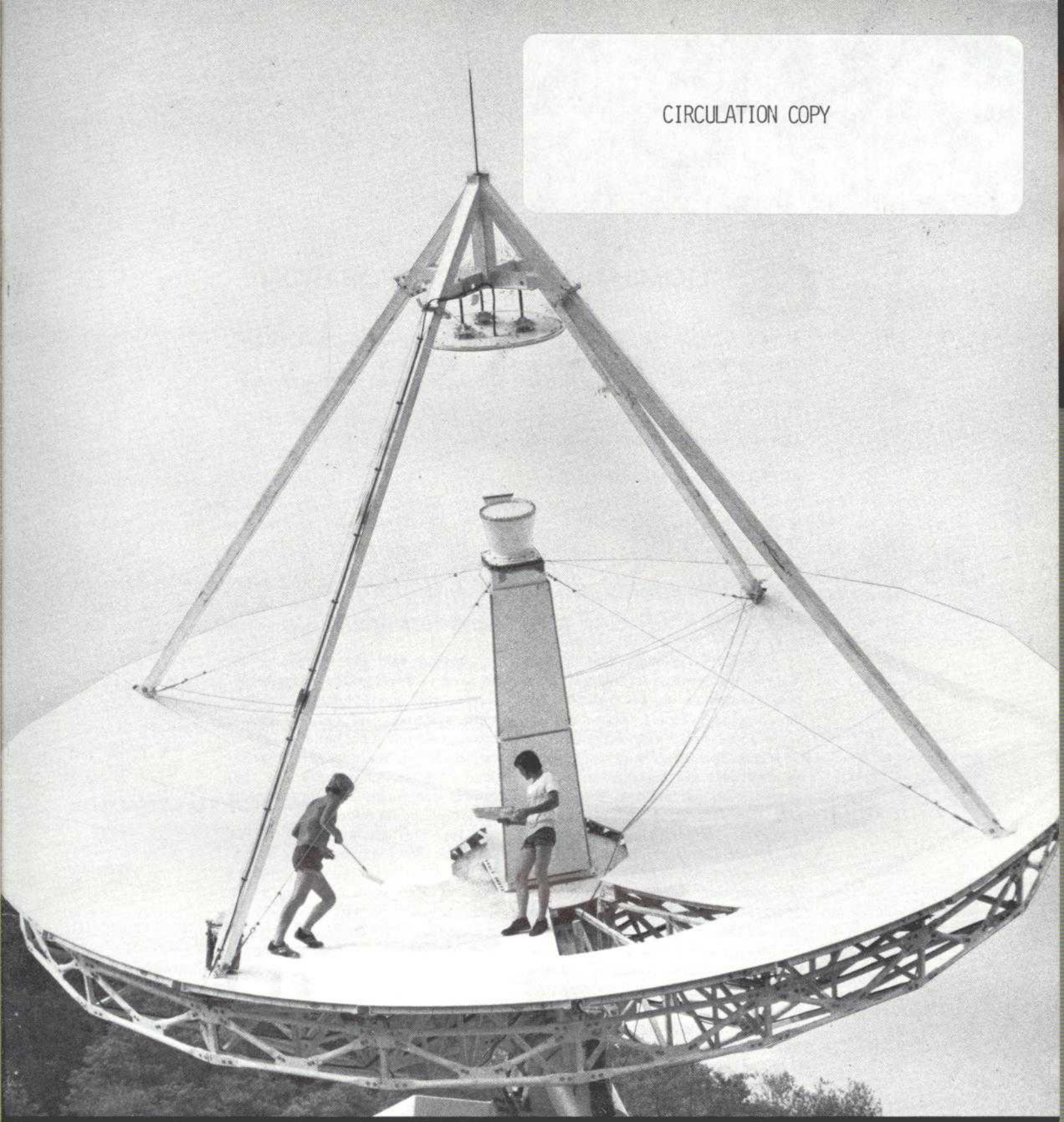
A hula show, sponsored by Kodak, and the art of Polynesian dancing in Kapiolanni Park near Waikiki.

During the "Pageant of the Long Canoes" at the Cultural Center two men from Fiji perform a traditional ceremonial dance.

A young Samoan at the Polynesian Cultural Center explains how to skin and slice a coconut.

Several of the COMSAT contingent tour the pineapple fields of the Dole Plantation outside Honolulu . . .

While Ron Garlow samples a slice of fresh pineapple.



COMSAT NEWS

May-June 1975
Vol. X No. 3

COMSAT GENERAL CORPORATION

COMSAT GENERAL Corporation has adopted as its corporate symbol a stylized treatment of the Corporation's initials as shown on this page.

The new "logo" (short for logotype) is being registered for federal trademark purposes.

The logo, designed by the Washington firm, Graphichouse, should not be altered or employed in any manner other than in its original design.

Late News

Contracts awarded COMSAT General for lease of MARISAT shipboard terminals

COMSAT General Corporation has received awards for the first shipboard terminals to be installed on ocean-going vessels operating in world commerce. These include:

- **U.S. Maritime Administration (MarAd):** for the lease of shipboard terminals to be installed aboard six U.S. flag vessels as part of a cooperative cost-sharing program between MarAd and the vessel owners.
- **Exxon Corporation:** for the lease of shipboard terminals to initially equip five Exxon-affiliated tankers to operate with the MARISAT System.

MarAd announced that the terminals will be installed aboard vessels of the Chevron Shipping Company, Moore McCormack Bulk Transport, Inc., U.S. Lines, Prudential Lines, Mobil Oil Corporation, and the Pacific Far East Line.

MarAd said the terminals "will be used to develop and evaluate advanced ship operation and management systems. The project will be controlled from the Maritime Coordination Center, National Maritime Research Center, Kings Point, N.Y. Additional companies will participate in the project in the future."

The first Exxon tanker to be equipped with the above-deck portion of the COMSAT General terminals was the *Esso Wilhelmshaven*, which was outfitted during a layover in Singapore. The *Esso Copenhagen* was similarly outfitted later, also in Singapore.

Earlier, COMSAT General announced agreement for installation of a terminal on the *Deep Sea Explorer*, a seismic vessel used for exploration in the offshore industry.

News in Brief

Directors elected to Board

Shareholders elect 12 directors to the COMSAT Board at 12th Annual Meeting of Shareholders held in May.

Three-satellite configuration adopted

INTELSAT Board of Governors adopt, for planning purposes, three-satellite configuration for Atlantic Region.

INTELSAT Governors elect officers

Geddes and Colino elected Chairman and Vice-Chairman, respectively, of INTELSAT Board of Governors by unanimous vote.

Final INTELSAT IV launched

Recent successful launching of INTELSAT IV completes network and concludes fourth generation satellite program.

Global system to support Apollo-Soyuz

Many firsts in communications during American-Soviet flight. Global system to have crucial role.

Introduction to Southbury

COMSAT General's Southbury Station prepares for operational debut with Atlantic MARISAT satellite.

Seismic ship to use MARISAT

SEAGAP Consortium to use MARISAT shipboard terminal on SEAGAP seismic vessel, "Deep Sea Explorer."

Request filed to provide DIGISAT service

COMSAT files request with FCC to provide DIGISAT service from Etam station to points in Atlantic Ocean Region.

Earnings reported—dividend declared

First quarter earnings equal to $1.27 per share reported and dividend of 25 cents per share declared by COMSAT Board.

Board R&D Committee visits West Coast

Research and Development Committee of Board of Directors visits West Coast Office and tours Hughes Aircraft Company.

Special Features

Apollo-Soyuz Mission: a special report on the joint American-Soviet manned flight, by John J. Peterson.
Labs Closeup by Shirley Taylor.

Cover: Contractors at Southbury Earth Station put final coat of paint on 34-foot antenna to be used with COMSAT General's COMSTAR I domestic satellite.

May-June 1975 Vol. X, No. 3

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Robert B. Schwartz, Director of Public Information
John J. Peterson, Editor
Edgar Bolen, Production
A Member of the International Association of Business Communicators.

Chairman and President address shareholders

COMSAT Chairman McConnell greets a shareholder attending the Annual Shareholders' Meeting held recently at the L'Enfant Plaza Hotel.

COMSAT President Charyk responds to a shareholder's question.

Following is the text of the remarks of COMSAT *Chairman Joseph H. McConnell at the Twelfth Annual Shareholders Meeting held May 13 in Washington, D.C.*

In the ten years since the little EARLY BIRD satellite began to provide commercial satellite service, COMSAT has been the major force in the expansion and improvement of global communications.

The global system has been operating successfully for almost six years and is being expanded further to meet the projected traffic demands.

Our international services and our net income have continued to grow steadily. Earnings for 1974 reached a record $4.49 a share. This was 86 cents, or approximately 24%, greater than our earnings for 1973. For the first quarter of this year, our earnings increased to $1.27 per share from $1.09 per share for the first quarter of last year, an increase of about 17%.

As we consider our successes, of course, we must also consider several factors which are beyond our control, or only partially within it. We are subject to extensive federal regulation. This includes the Federal Communications Commission—the FCC—which has been investigating our rates for global service for some time. The issues include consideration of the items that should be included in our rate base and the rate of return we should be allowed. We expect the FCC to hand down a decision this year. Of course, this will be a very important decision for us.

We also continue to face competition from undersea cables and, as we saw this year, the risk of launch and satellite failure is always with us.

We are determined not to allow these uncertainties and risks to deter us from maintaining COMSAT's preeminent position in satellite communications. In addition to fulfilling our key role in expanding the global system, we are pressing forward to establish maritime, domestic and aero-

(Continued on page 15)

Following is the text of the remarks of COMSAT *President Joseph V. Charyk at the Twelfth Annual Shareholders Meeting held May 13 in Washington, D.C.*

Good afternoon ladies and gentlemen. My report this year is a particularly plesant task, for June 28 marks the Tenth Anniversary of the initiation of commercial service between the United States and Europe by the EARLY BIRD satellite, which is also known as INTELSAT I.

In retrospect, this small electronic marvel, not much larger than a lady's hat box, began a new communications era. EARLY BIRD was the forerunner of the present global satellite system. It paced a decade of communications progress that has completely changed world communications, and it helped set the stage for the use of satellites for specialized services such as domestic, maritime and aeronautical communications.

When EARLY BIRD went into service in 1965, only five countries had earth stations for satellite communications: the United States, England, France, West Germany and Italy. Today 64 countries, territories or possessions have the earth station facilities required to operate with the global system of satellites positioned over the Atlantic, Pacific and Indian Oceans.

Satellite services are also extended to other countries through terrestrial connections. In 1965, only 15 countries, territories or possessions were leasing satellite services on a full-time basis; today that number has reached the amazing total of 107.

EARLY BIRD could operate with only two earth stations at a time, thus providing only one point-to-point communications pathway, as do transocean cables. Its maximum capacity was about 240 two-way telephone circuits. With the second generation INTELSAT II satellites, however, a multiple access capability was introduced which permitted all earth sations within a satellite's area of coverage to

(Continued on page 15)

Corporate Secretary Robert B. Schwartz discusses agenda with Dr. Charyk prior to opening of meeting.

Shareholders register . . .

COMSAT shareholders elect directors

COMSAT shareholders elected 12 directors at the 12th Annual Meeting held in May. The elected directors are: Joseph V. Charyk (President of COMSAT), Gordon Edwards, William W. Hagerty, John D. Harper, George L. Killion, Melvin R. Laird, Joseph H. McConnell (Chairman of the COMSAT Board of Directors), Rudolph A. Peterson, John B.M. Place, Bruce G. Sundlun, Leo D. Welch and William L. Zimmer III.

With the exception of Mr. Laird, each of the 12 elected directors previously was elected by shareholders. Mr. Laird was elected by the other directors in 1974 to fill the unexpired term of Philip W. Buchen who resigned from the Board upon becoming Counsel to the President of the United States.

Three other COMSAT directors are appointed by the President of the United States with the advice and consent of the U.S. Senate. Presently serving as Presidentially appointed directors are Frederic G. Donner and George Meany. The President's reappointment of Messrs. Donner and Meany and his appointment of Edward E. David, Jr., are awaiting Senate confirmation.

More than 8,000,000 of the 10,000,014 COMSAT shares outstanding were voted for each of the 12 elected directors. There was one other candidate for election—Lillian R. Levy of Washington, D.C., a COMSAT shareholder and non-management nominee. Approximately 1,700 shares were voted for Mrs. Levy. K. C. Jones, coach of the Washington Bullets professional basketball team, received 300 votes although he had not been nominated in time to be a qualified candidate.

view display . . .

and raise questions from the floor.

INTELSAT IV (F-I) launched, last of series

By Larry G. Hastings

After a disappointment February 20 at Cape Canaveral, the successful launch of the INTELSAT IV (F-1) commercial communications satellite on May 22 completed the planned seven-satellite INTELSAT IV global network. Through countdown, launch and injection into geosynchronous orbit, the mission was a jewel of precision, skill and dedication.

On the night of February 20, the Atlas-Centaur bearing the INTELSAT IV (F-6) towards transfer orbit lifted off and performed in an apparently nominal manner—at least for the first several minutes. But then, shielded from view by a cloud cover around Cape Canaveral, the launch vehicle malfunctioned and was aborted over the Atlantic Ocean, far enough away from the mainland so that no fragments fell to earth but close enough that the flash could be seen from Miami and West Palm Beach.

NASA appointed a failure review board which reported, after its review of telemetry data and procedures, that the mechanical culprit was a relatively simple fixture—a lanyard—which gave way when it tried to perform its function during the electrical disconnect between the Atlas booster and sustainer section during staging in the vehicle's flight.

Mr. Hastings is a COMSAT *Senior Information Officer.*

After boosters perform their programmed part of the flight and burn out, they are separated from the sustainer or main engine of the Atlas. At this point, as the boosters begin to drop away, all electrical plugs or connectors are separated by various means, including lanyards. In this instance, one of three such lanyards did not provide proper mechanical release, resulting in an electrical connector being yanked apart, causing a short circuit and, ultimately, failure of the mission.

It was, according to Henry Stone, NASA's Atlas Centaur Project Manager at Lewis Labs, "a nickel and dime part" which caused that malfunction. Amazingly, it was the first failure of that type in over 400 Atlas launches.

But, at 6:04 p.m. EDT, on Thursday, May 22, there was to be no such failure. Not even the weather failed. At that hour, the sun was still bright and the Florida skies were a Chamber of Commerce crisp blue.

Watching the countdown and launch from a special viewing site were members of the Earth Station Ownership Committee who had scheduled a meeting in Cocoa Beach to coincide with the launch. At the City of Cape Canaveral's beach, Jetty Park, several thousand watched and listened to the countdown over loudspeakers; at various locations at the Kennedy Space Center and the Air Force Cape Canaveral Eastern Test Range, seven hundred people brought out by NASA tour buses, applauded and cheered as the 130-foot silver and white rocket rose skyward with its valuable payload. In addition, more than 400 persons, including NASA employees and guests of COMSAT and INTELSAT, thrilled to the blinding glare and thunderous roar of the lift-off.

The performance of the rocket—booster engine cut off, separation and fall away, and staging—was clearly visible to both veteran and novice bird-watchers for several minutes. A down-range television tracking camera with long range lens was able to follow the flight for five and one half minutes providing a view which even the experienced engineers, scientists and space agency officials rated as "astounding." At five and one half minutes into the flight the Atlas-Centaur was 117 miles high and 42 miles down-range before it was lost to the view of the TV cameras.

Inside the Mission Director's Center, plot boards with their automatic marking pens followed the flight. Trajectories, flight paths, speeds and altitudes all were nominal, according to the voices coming over the headsets of those at the consoles.

Then, 44 minutes later, the earth station at Carnarvon, Australia, acquired the satellite. The on-time acquisition meant that the INTELSAT IV (F-1) was in transfer orbit. The first leg of its journey to a spot in space above the equator where it would serve the Indian Ocean region was a success.

At the regular post-launch news briefing, NASA's Director of Unmanned Launch Operations, John J. Neilon, found little about which to comment, so perfect had been the launch. "Ditto" for R. F. Schmidt of NASA Headquarters and Slone of Lewis Laboratories which has the primary responsibility for the Atlas-Centaur. Martin J. Votaw, COMSAT's Assistant Vice President for Engineering, an-

Members of the Earth Station Ownership Committee take time out from their meeting at Cocoa Beach, Florida, to watch the INTELSAT IV launch. Viewing the launch vehicle and its satellite payload are, left to right, William Callaway of COMSAT, Robert Newman of AT&T, Lawrence DeVore of COMSAT, Thomas O'Reilly of Hawaiian Telephone, John Hannon of COMSAT, Howard White of ITT Worldcom, Eugene Becken of RCA Globcom and Robert Conn of WUI. General James McNitt, President of ITT Worldcom, does not appear in the picture.

nounced that the "bird" had been acquired by Carnarvon and that already it was being checked out and readied for apogee motor firing. This would, Votaw said, take place during fifth apogee which would occur during the evening of Saturday, May 24. At that point, the satellite would be at about 165 degrees East longitude over the equator, west of Hawaii.

In concluding the press conference, Mr. Votaw expressed gratitude and appreciation on behalf of the 91 members of the INTELSAT organization to NASA, which launches the satellites for INTELSAT; to the Hughes Aircraft Company, which manufactures the satellite and to the General Dynamics Corporation, which builds the Atlas-Centaur launch vehicles, for their work in helping to bring the INTELSAT IV global network from concept to reality.

Saturday, May 24, INTELSAT IV takes the Fifth

At about 22,300 miles in space above the equator, the sun was shining and all was well, while outside the INTELSAT Spacecraft Technical Control Center in Washington, a misplaced monsoon season seemed to have arrived. Sheets of rain swept through Washington and abated. At the adjoining L'Enfant Plaza Hotel, President Gerald R. Ford arrived to meet with some of his wartime Navy colleagues. A handful of tourists, totally unprepared for such a bonus to their sightseeing tour, watched in surprise as the Presidential motorcade stopped in front of the hotel and scrambled to plug flash bulbs into their Instamatics and Polaroids.

While this orderly excitement was taking place outside on the Plaza, orderly procedures were being followed by the crew in the Spacecraft Control Center. At the main console, Assistant Vice President, Technical, Dennis V. Neill, and Control Spacecraft Technical Manager William H. Brauer were giving procedural steps and commands to the earth stations at Paumalu, Hawaii, and Carnarvon Australia.

Paumalu would execute the command firing the 1,510-lb. solid fuel apogee motor which would thrust the satellite into its geosynchronous orbit if all went as planned.

Red-numeralled digital clocks winked the seconds away as Messrs. Neill and Brauer gave commands to the stations, the words spoken methodically; "on my mark, execute; . . . four, three, two, one"—finally at 6:28 p.m. the word was "mark!"

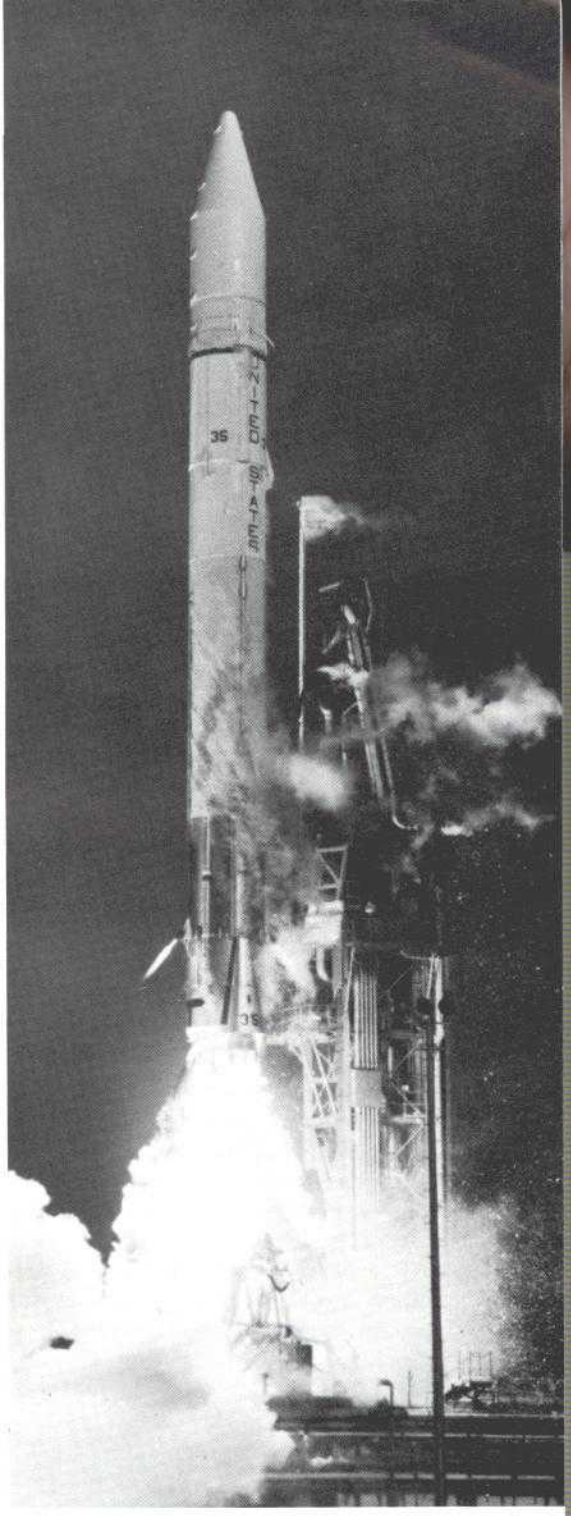
The dots and X's began to follow the proper track on the plot boards. Dr. John Harrington, Vice President Research and Development; George P. Sampson, Senior Vice President International Systems Division, and Martin Votaw watched the data on strip chart recorders as the apogee motor burned. All looked good.

At T plus 33 seconds the telemetry charts showed burn-out. "That's nominal", said Votaw. "Looks like we've got another good one," Gen. Sampson said with a broad smile. Dr. Harrington reviewed a press release which was to be phoned to the news wire services while Assistant Vice President for International Systems William Wood checked a message which Ed Wright would TWX to the INTELSAT Board of Governors.

After reviewing telemetry strip charts and print-outs, those not vital to the operation began to drift away. Denny Neill and Bill Brauer were still issuing commands to Paumalu. Technicians, engineers and mathematicians began their long night's vigil—a vigil which would stretch into a three-week testing period. Then, the new INTELSAT IV would be drifted to its station at 61.4° East longitude where, about mid-July, it would be ready for service.

Outside the Control Center, the weather looked better, the President had left the L'Enfant Plaza Hotel and the tourists relived their exciting moment, pointing to where the waving, smiling President had walked and where they had stood as he walked by.

Inside the Control Center, there had been exciting moments too, but, the tourists didn't know that. Besides, for them the long Memorial Day weekend was here. Ho-hum? Maybe for the tourists and some of the media, but not for the hard-working Control Center staff.



Liftoff of the INTELSAT IV (F-1)

Station Manager David L. Durand, left, discusses the results of an equipment test with Bart Bartlett, station engineer.

Southbury Station prepares for operational debut

STORY AND PHOTOS
BY J.T. MCKENNA

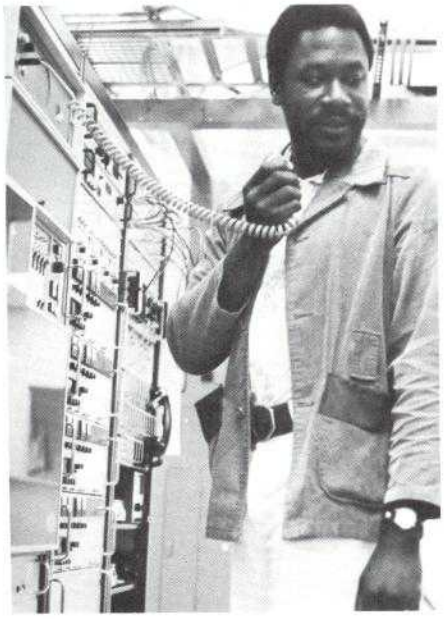
Situated along the Housatonic River in Southbury, Connecticut, is the East Coast earth station facility for maritime and domestic satellite communications, its antennas pointing out over the Atlantic, ready for the first MARISAT launch.

Using a 42-foot dish antenna and related electronic equipment, Southbury will be the international satellite gateway for commercial telephone, teletype, and facsimile messages to ships in the Atlantic Ocean.

The facility, under the direction of COMSAT GENERAL's David Durand, has a nine-member staff. Each has been preparing for the first MARISAT launch through formal classroom exercises, reading and digesting technical manuals in addition to hands-on training with the new equipment.

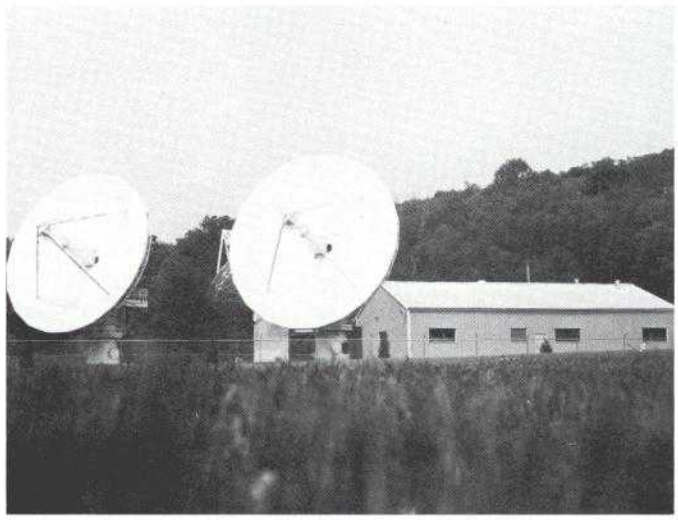
The Southbury station will be responsible for all communications to the Atlantic MARISAT satellite in addition to the technical tasks of tracking, commanding and acquiring telemetry data from the Atlantic maritime satellite. These MARISAT tasks will be accomplished through the use of a 42-foot antenna dedicated to providing MARISAT TT&C services and communications services to ships at sea as well as the off-shore drilling industry. A second 42-foot dish acts as a back-up to the MARISAT antenna. This back-up antenna will be assigned normally to domestic satellite operations but has the technical capability of working with either the MARISAT or domestic satellite.

Ron Hicks, senior electronics technician, programs a voice command into the station's minicomputer to be used in commanding the first MARISAT satellite. Ron's specialty is the station analog equipment used in the satellite control area of the station.



Jim Nelson, senior facilities man at Southbury, has responsibility for the daily maintenance requirements of the site, including the proper operation of the air conditioning system and the station's diesel, which supplies emergency power to the station.

Eileen Jacobsen, station secretary, handles the administrative requirements of the site including communications messages, payroll and accounting tasks.



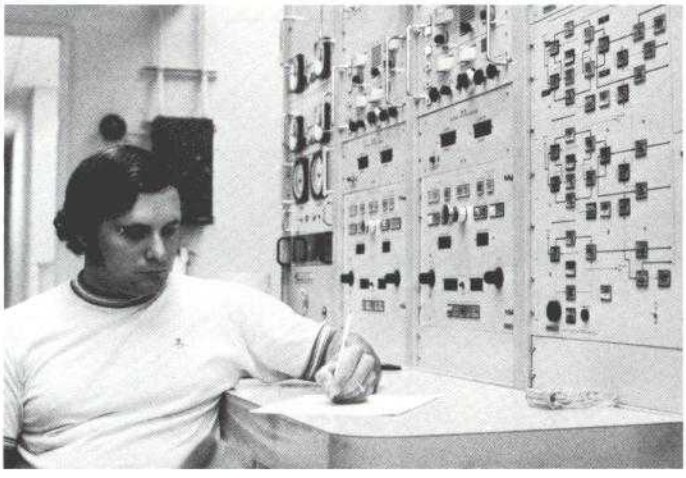
Southbury's communications antennas seen in their operational positions. In the background, between the two 42-foot dishes, is the limited-motion 34-foot (shown also on cover) antenna for COMSAT General's domestic satellite program, COMSTAR I.

Early in 1976, Southbury personnel will provide technical support services to COMSAT GENERAL's domestic communications satellites, COMSTAR I, using the full-performance 42-foot dish and a dedicated 34-foot limited motion antenna. These antennas and their associated electronic equipment will provide tracking, telemetry and ranging data as well as commanding the COMSTAR I satellites.

These two major satellite programs with their technical and operational requirements have put a great deal of responsibility on the COMSAT GENERAL staff at Southbury. However, Durand expressed complete confidence in the members of his team, most of whom are new to COMSAT GENERAL and the Southbury area.

Through early May, most of the technicians' training had been through manuals and classroom work, but in late May they were given an opportunity to perform a hands-on readiness test with the launch of INTELSAT IV (F-1). Using the station's 42-foot, full performance antenna, the station tracked, monitored and stored data from the satellite during its transfer orbit. The technicians, under the direction of station engineer "Bart" Bartlett, tracked the new

Dave Davies, an electronics technician, records tracking data from the station's full-performance 42-foot antenna. Dave, like the other technicians, has spent a large amount of time becoming familiar with the equipment in preparation for the MARISAT and COMSTAR I programs.



Dave Kellie, a senior electronics technician, is responsible for maintaining operational status of the station's digital equipment. Dave is primarily involved with the station's minicomputer and the software associated with it. Here, Dave observes a readout from the station's TT&C equipment, which was designed and built by the COMSAT Labs.

Roger Miner (standing), was the chief station engineer with an AM broadcast station prior to joining the Southbury staff. He and Dave Davies discuss the performance of the station's monitoring equipment used in pointing the 42-foot full performance antenna.

INTELSAT satellite using the autotracking system. Data received at Southbury from the satellite was sent to Washington for later analysis and comparison with data received from the INTELSAT tracking stations.

Everyone was very enthusiastic about the tracking and data exercise during the INTELSAT launch. As one technician commented, "It's one thing to read about what happens during a launch but quite a different thing to actually participate in one."

Mr. McKenna is a COMSAT *Information Officer.*

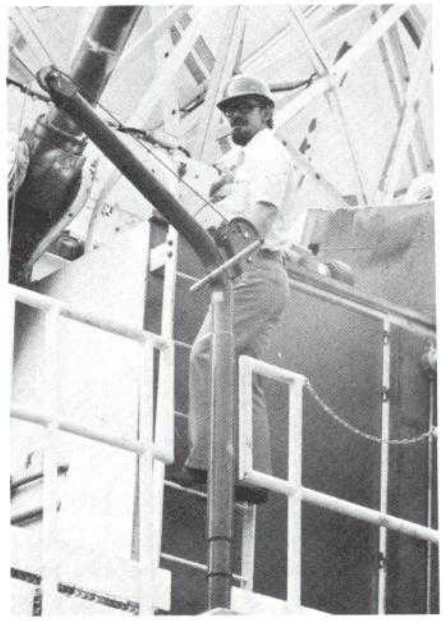
Among Southbury's nine employees are seven technical personnel, a secretary and a senior facilities man. Durand, who heads up the station, has been an engineer with COMSAT for nearly ten years. Prior to joining COMSAT GENERAL as station manager he was chief engineer at the Andover, Maine, earth station.

Durand and his station engineer, Bart Bartlett, have been training the new personnel in the operation of the station's equipment for many months in preparation for the first MARISAT launch with everybody looking forward to handling the first commercial message to a ship at sea.

"It's been a tremendous professional challenge putting this station together," said Durand. "When I first came here it was little more than farmland and a few pieces of construction equipment. In the passing months we not only had to get the station started, we also had to become a part of the community. Later, personnel had to be hired and trained to form a cohesive operating team for one of the most sophisticated programs ever undertaken by COMSAT or COMSAT GENERAL.

"Managing a field office is really a large but interesting responsibility, you make decisions and maintain good relations with the community where you work and live. It has been a challenge but the payoff will come when the first commercial message comes through the station on its way to a ship at sea via MARISAT."

Interest in the facility has been growing in the Southbury community as the site nears completion. The station has had many visitors, including local town officials, representatives of the press and residents of nearby Heritage Village, a large retirement community.



"Bart" Bartlett, seen here at the rear of the MARISAT antenna, is the station engineer who supervises the activity of the station's technicians, including their training and scheduling. Once the station is operational, "Bart" will have responsibility for the technical and operational aspects of the site. "Bart" was an engineer at COMSAT's Alaska station, prior to joining COMSAT General last year.

ED. NOTE. Marc D. Gordon, electronics technician, was on travel at the time this story was written and does not appear in the accompanying photos.

Board of Directors' R&D Committee visits West Coast

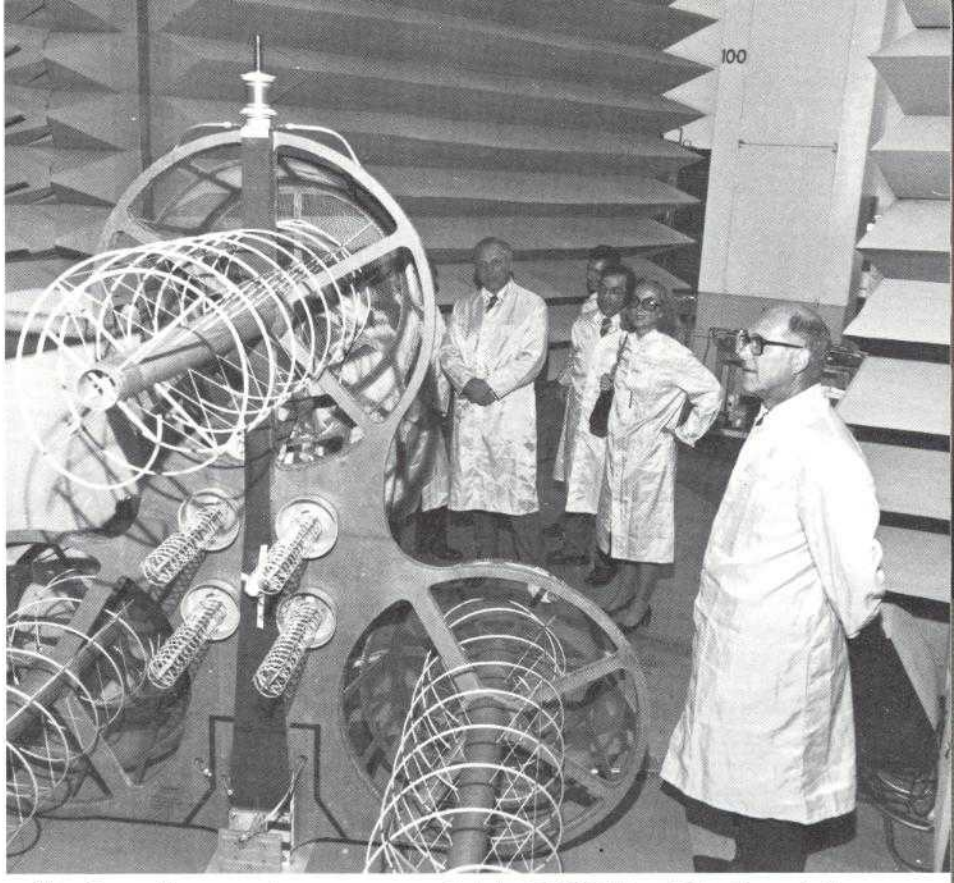
The Board of Directors' Committee on Research and Development met recently in El Segundo, California, to review the activities of the Corporation's West Coast Technical Project Office and to receive a briefing and tour of the facilities of Hughes Aircraft Company.

The members of the committee attending the meeting were William W. Hagerty, Chairman, John D. Harper and Bruce G. Sundlun. Members of the staff present at the Committee meeting were John V. Harrington, Vice President, Research and Engineering; Martin J. Votaw, Assistant Vice President-Engineering; Eugene T. Jilg, Director, West Coast Technical Project Office; Jerome W. Breslow, Assistant Secretary; and Donald E. Greer, Headquarters Executive Officer.

The Committee received a briefing from Mr. Jilg with respect to the history, organization and functions of COMSAT's West Coast Office, and a review of the role that office played in solving a number of spacecraft problems, including satellite outages caused by static discharge, intermodulation "noise" in the MARISAT antenna and failures of aluminum-lead integrated circuits.

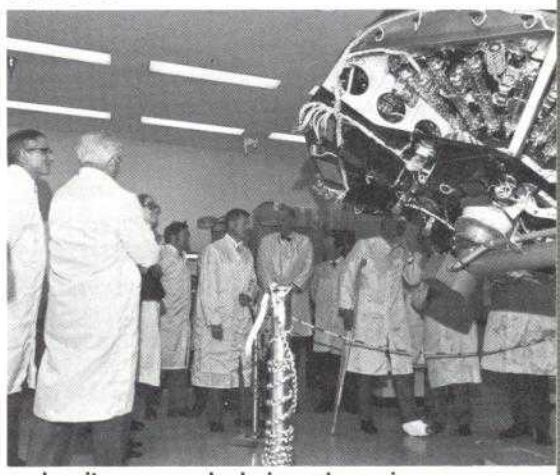
The Committee also visited facilities of the Space and Communications Group of Hughes Aircraft Company. The Committee received a presentation from A.D. Wheelon, Vice President and Group Executive, and from other executives of Hughes Space and Communications Group on Hughes, its design philosophy and the MARISAT, INTELSAT IV-A and COMSTAR I satellite programs. Following the presentation there was a discussion of matters relating to the various satellite programs.

Hughes hosted a buffet luncheon followed by a tour of the Hughes facilities, during which the group was able to observe the myriad steps in the fabrication of spacecraft.



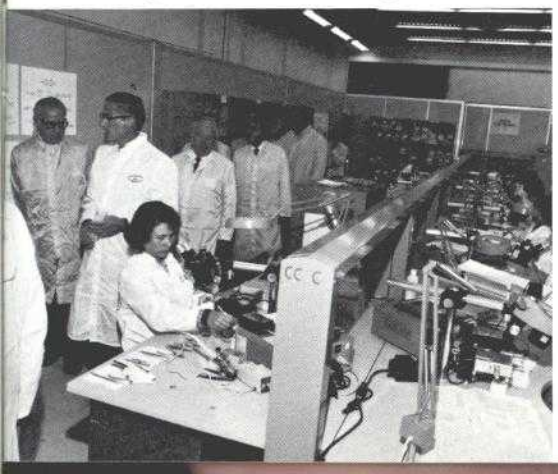
The Committee members, accompanied by COMSAT and Hughes staff, visit Hughes Aircraft to observe a MARISAT antenna in an anechoic chamber. . .

. . . view a COMSTAR I satellite electronic shelf . . .



and witness work being done in a high bay area on a COMSTAR I satellite antenna.

inspect its manufacturing facilities. . .



look at a display of communications hardware items. . .

Board of Governors elects new officers; approves Atlantic Region plan

Twenty-two of the twenty-three Governors, representing 58 of the 89 Signatories, attended the Fifteenth Board of Governors Meeting held in Washington, D.C., in May.

The Meeting was attended for the first time by the Governor of the Caribbean Group (Barbados, Dominican Republic, Haiti, Jamaica, Trinidad and Tobago).

The following actions were among those taken by the Board:

Administrative matters

- Unanimously elected William G. Geddes, the present Vice-Chairman and Governor for U.K./Ireland, as Chairman and Richard R. Colino, U.S. Governor, as Vice-Chairman for twelve-month terms.
- Appointed the following officers for its Advisory Committees: Finance Committee, Chairman Yves Langlois (Canada), Vice-Chairman Philippe Binet (France); Planning Committee, Chairman P. B. Meulman (Australia), Vice-Chairman C. J. Steffen (Switzerland); Technical Committee, Chairman G. Quaglione (Italy), and Vice-Chairman A. H. da Costa (Brazil).
- Established a Special Committee to discuss with the U.S. Government the remaining issues of the INTELSAT Headquarters Agreement. The Committee is composed of L. F. T. Perrone (Brazil) and E. Endo (Japan), and headed by Jose Alegrett (Venezuela/Colombia/Chile).

Technical and Operational Matters

- Adopted, for planning purposes, a three-satellite configuration using the operational spare concept in the Atlantic Region during the period end-1977 to mid-1979. The Management Services Contractor was requested to communicate this decision to the Atlantic Operations Representatives and to discuss with them diversity routing in the Atlantic Region.
- Directed the Management Services Contractor to provide additional technical analyses and revised contractual language for the INTELSAT V RFP in such areas as incentives and late delivery penalties.
- Decided that the TDMA field trial participants may use the equipment operationally subject to: successful conduct of the trials; a future determination that such use will not adversely affect the space segment; and terms and conditions, including the charges, which will be established later.
- Requested the TDMA Coordinating Group to provide as soon as possible final plans for the trials, including regions, participants and schedule, to permit consideration of operational use of TDMA during the INTELSAT V program.
- Authorized the Secretary General to write IMCO confirming INTELSAT's interest in meeting possible space segment needs of the maritime community, indicating that INTELSAT is close to issuing an INTELSAT V RFP solely to meet its own requirements and without a maritime option, and stating that for INTELSAT to take maritime requirements into account IMCO should inform INTELSAT of these requirements as soon as possible with quantitative details.
- Authorized, in principle, the allotment of spare capacity equivalents to one INTELSAT IV transponder in an Atlantic or Indian Ocean Region satellite to the Signatory of Nigeria to meet its domestic telecommunications requirements. The other terms and conditions of the allotment agreement with Nigeria will be substantially the same as those in the allotment agreement with Algeria, including the five-year term of the agreement at a charge of $1 million per annum.
- Noted that the Secretary General will respond to the Philippine Signatory's request for information on the terms for the preemptible lease of a half transponder. The Board also noted that the inquiry regarding special annual charges for daily TV use would be analyzed in further discussions with the Signatory and a report made to the Governors at a later meeting.
- Approved the RFP for TTC&M after the current agreements which expire in December 1975 and authorized its issuance to interested Signatories.
- Authorized the Management Services Contractor to participate in the Air Force nickel-hydrogen battery experiment under contract to TRW.
- Approved the U.S. ship station, which will cover the APOLLO-SOYUZ splashdown, for television transmission from July 5 to July 24, subject to verification of the performance characteristics.
- Approved use of small stations at Yamaguchi (Japan) and Taipei (Taiwan) for access without charge to satellite to conduct rain depolarization experiments.
- Approved the Ahmedabad (India) station for access without charge to satellite to conduct one-time tests dur-June and July of its TV capability.
- Approved two Malaysian stations for use with Malaysia's leased satellite transponder subject to certain technical conditions.
- Noted the report by the Management Services Contractor on the coordination procedures which have been followed in respect to experimental transmissions between Canada and the SYMPHONIE System, and that the first phase of the experimental transmissions had taken place without any harmful interference to the INTELSAT space segment.

Finance and Legal Matters

- Decided that the Executive Organ will comment on the Management Services Contractor's Budget and both entities will review the task list, accounting and cost allocation procedures employed by the Management Services Contractor. The Executive Organ will submit more detailed status reports and will present budget proposals each fall to cover merit increases and changes to the salary structure or grades in the following year.
- Approved guidelines for the division of costs between INTELSAT and the Signatory hosting an away meeting of the Board or the Global Traffic Group.

Accepted the invitation of the Signatory of the Netherlands to hold a meeting in The Hague, May 19-26, 1976.

The next Board of Governors Meeting will be held July 9 through 16 in Washington, D.C.

The preceeding report was prepared by Ellen Hoff of the International Affairs Division.

INTELSAT Contract awards

To **Marconi Research Laboratories,** Chelmsford, England, a 12-month, $125,000 contract for the construction and testing of a laboratory model of a Butler Matrix Transponder.

To **Nippon Electric Company,** Tokyo, Japan, a 13-month, $100,000 contract for the study of adaptive networks for interference reduction for frequency reuse application.

To **Research Foundation of State University of New York,** a 15-month, $99,894 contract for the study of Radiation Induced Defects in Solar Cells.

Satellite communications talks open Representatives from 50 nations present

(Reprinted from the May 14, 1975, issue of The Daily Gleaner, Kingston, Jamacia.)

A four-day INTELSAT Operations Representatives conference for the Atlantic Region sponsored by JAMINTEL which operates an earth station subscribing to the INTELSAT system opened at the Jamaica Pegasus Hotel yesterday morning.

The Minister of Works, the Hon. Sydney Pagon, in declaring open the conference took the opportunity to announce that the subject of communications was now under his portfolio. Prior to this, the Minister of Public Utilities and Transport, the Hon. Eric Bell, was responsible for communications.

Noting that the conference was of world wide importance, the Minister said that he was very happy to see it being held in Jamaica just after the Commonwealth Heads of Government conference. He added that they were all aware of the very complex and advanced technology which made communications by satellite possible.

"This technology has ushered in a new era in which international telecommunications already have staggering capabilities including live international TV transmission, high speed data transfer, demand assigned circuits; and as for the future we look forward to see such exciting possibilities as international videophone where we can not only hear people talk but can see the person to whom we are speaking no matter how far they are away from us."

However, the Minister warned that technology was only a tool. Its values, usefulness and potential were matters to be decided by those who use it.

Tribute to group

It was a tribute to this group that in spite of particular operational difficulties, a spirit of cooperation and goodwill had prevailed, and plans which were generally accepted had been found. It was even more significant when it was considered that there was no formal machinery for resolving difficulties.

The Minister in concluding noted: "It is the hope of this country that this spirit of goodwill and cooperation will not only continue to exist, but will flourish, and be an example to other organizations of the power and creativity of cooperation for it is our belief that it is not only the survival of satellite communications that is dependent on this spirit of goodwill and cooperation, but the survival of mankind itself."

Mr. H.W. Wood, vice chairman at the conference, said that the importantance of this conference could not be overemphasized. He said that the ability to meet the communications requirements of the world would depend on the way the groups represented at the conference respond to the planned usage of the system.

Delegations and observers from 50 countries including South Africa and Russia are attending the conference which is the first of its kind to be held in the Caribbean region. The last conference was held in London in September last year and it was there that JAMINTEL offered to host the conference in Jamaica this year.

Conferences of this nature are organized and held on an annual basis by Communications Satellite Corporation (COMSAT) who are the Management Services Contractors for INTELSAT, the owners of the satellite system which enabled global satellite communications coverage.

INTELSAT operations system is divided into three regions—the Atlantic, Pacific and the Indian Oceans. The conference here will deal specifically with matters relating to the Atlantic region and to agree on plans for the effective utilization of existing facilities and discuss and formulate plans for future expansion of the system in order to enable the MSC to make proposals to the Board of Governors of INTELSAT for the provisions of space segment facilities to meet the needs of the users of the system.

Conference Chairman Mr. C. Rickards welcomed the delegates and introduced the Minister.

Interested visitors to the DIGISAT demonstration are briefed by COMSAT personnel at INTERFACE '75, a data communications conference. John Mullen of Service Development is showing the computer readout on a Tektronix monitor to observers while George Lawler points out the global satellite system.

COMSAT demonstrates satellite capability

STORY AND PHOTOS
BY ALLAN GALFUND

Since the beginning of the year, COMSAT has participated frequently in conferences, demonstrations and exhibits with two of the major efforts concentrated on INTERFACE '75 in New Orleans, La., and the 28th Annual Conference and Telecommunications Exposition of the International Communications Association in San Francisco, California.

At the Data Communications Conference and Exposition—INTERFACE '75—held at Rivergate Convention Center in New Orleans, COMSAT's exhibit featured a live demonstration of DIGISAT at 4,800 bps in which a Tektronix Graphic Display Terminal operating with an IBM 360/65 Computer at COMSAT Labs illustrated one typical application.

The terminal was connected through a modem and terrestrial circuitry to a similar modem and DIGISAT equipment at the Etam, W. Va., earth station. The circuit was then looped through an INTELSAT IV Atlantic Ocean satellite and extended from the Etam DIGISAT equipment through modems and terrestrial circuitry to the computer. The Graphic Terminal queried the computer with requested information displayed visually. A companion hard copy provided a permanent reproduction on demand.

Exposition officials estimated that more than 2,100 visitors circulated through the exhibit halls daily. Those

Mr. Galfund is a COMSAT *Senior Information Officer*

John Mullen of Service Development (left) explains the COMSAT demonstration of DIGISAT during the ICA Exposition in San Francisco while Hostess Cindy Carrigan distributes literature.

Visitors to the COMSAT DIGISAT demonstration crowd around the booth waiting their turn to write a message to be transmitted via the Jamesburg earth station and looped through the Pacific INTELSAT IV satellite back to the COMSAT booth. The occasion was the ICA Telecommunications Exposition held at the Hyatt-Regency Hotel in San Francisco.

at national conferences

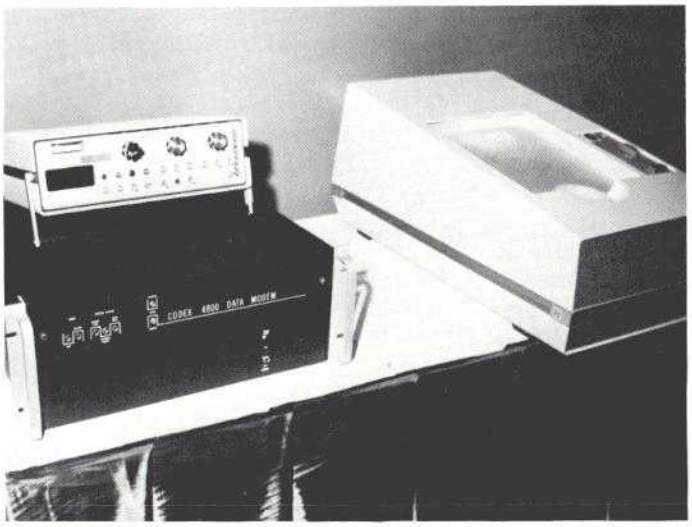
Visitors to the COMSAT DIGISAT demonstration at INTERFACE '75 held recently in New Orleans are briefed by Director of Service Development, George Lawler. INTERFACE '75, a data communications conference, attracted nearly one hundred companies to exhibit their products or services at the Conference and Exposition.

visiting the COMSAT booth were briefed on the potential and capabilities of global satellite communications and were given personal demonstrations of DIGISAT along with selected handout materials.

The Telecommunications Exposition of the ICA held at the Hyatt-Regency Hotel in San Francisco included a COMSAT demonstration featuring a DACOM, Inc., digital facsimile transceiver operating over a DIGISAT circuit with another transceiver illustrating one typical application of COMSAT's new service. A transceiver on one side of the booth was connected through a modem and terrestrial circuitry to a similar modem and the DIGISAT equipment at the Jamesburg Earth Station. The circuit was then looped through an INTELSAT IV Pacific satellite and extended from the Jamesburg DIGISAT equipment through modems and terrestrial circuitry to a transceiver on the other side of the booth. Page copy was then exchanged between the two transceivers at 9,600 bps.

The DIGISAT demonstration was a popular stopover for the many hundreds of ICA members who attended the Conference and Exposition. Visitors were briefed by COMSAT personnel on this new international service and how it would help meet the growing demand for economical data transmission to many parts of the world.

The CODEX 4800 Data Modem (left) used in the COMSAT DIGISAT demonstration. The Tektronix machine at right produced the hard copy presented to visitors to INTERFACE '75.



COMSAT hostess Shirley Goldman operated the Tektronix keyboard at INTERFACE '75, typing in visitors' names which were then transmitted via the Atlantic INTELSAT IV satellite to the COMSAT Labs and returned. The material transmitted can be seen on the Tektronix monitor.

Geddes and Colino elected by Board of Governors

William G. Geddes

William G. Geddes of the United Kingdom and Richard R. Colino of the United States were unanimously elected Chairman and Vice-Chairman, respectively, at the recent INTELSAT Board of Governors meeting for one year terms beginning May 14, 1975.

Mr. Geddes succeeds Mr. Jose Alegrett of Venezuela. Mr. Colino succeeds Mr. Geddes.

Mr. Geddes has been a member of the Board of Governors and its predecessor the ICSC since 1967 as the representative of the United Kingdom and Ireland. He is head of the International Satellite Communication Division of the External Telecommunications Executive of the British Post Office.

Mr. Colino, the U.S. Governor on the Board, came to COMSAT in 1965 as Director of the International Arrangements Division. Later the same year he was designated Alternate United States Representative to the ICSC. In 1968 he established the COMSAT European Office in Geneva and served as its first Director until 1969 when he returned to Washington as Assistant Vice-President for International Affairs. In 1973 Mr. Colino was named U.S. Governor and, in the following year, assumed his present position of Assistant Vice-President for International Relations and Corporate Planning.

Richard R. Colino

He is the author of a monograph entitled, *The* INTELSAT *Definitive Arrangements: Ushering in a New Era in Satellite Communications*, published by the European Broadcasting Union (EBU).

Seismic vessel to use MARISAT shipboard terminal

Phillips Petroleum Company of Bartlesville, Oklahoma, the operator for the SEAGAP Consortium, has agreed with COMSAT GENERAL Corporation to utilize a MARISAT shipboard terminal on its SEAGAP seismic vessel, the *Deep Sea Explorer*. This vessel will be operated by the Petty-Ray Geophysical Corporation.

SEAGAP is an oil exploration corporation composed of Phillips Petroleum Company, Getty Oil Company, AGIP and Hispanoil.

The *Deep Sea Explorer* will be the lead vessel in the SEAGAP worldwide network of seismic exploration and will be backed by a dynamically positioned drill ship.

The shipboard terminal, one of 200 being built for COMSAT GENERAL Corporation, will be the first to be installed aboard a vessel used in the offshore industry. The terminal will provide the essential link at sea to operate with the new two-ocean maritime satellite communications system, called MARISAT, to be placed in full-time commercial operation this year.

This MARISAT System will be capable of providing for the first time reliable, high-quality voice and data communications via satellite to commercial ships at sea, 24 hours a day.

The system will include two multifrequency satellites positioned in geostationary orbits at 22,300 miles altitude—one over the Atlantic Ocean and one over the Pacific Ocean. Earth stations operating with the satellites are at Southbury, Connecticut, and Santa Paula, California.

The first satellite, to be emplaced over the mid-Atlantic, is scheduled to be launched in late 1975.

The shipboard terminals include an above-deck portion consisting of a four-foot diameter antenna, protected by a fiberglass radome, with an automatic steering mechanism to keep it "locked on" the satellite at all times, and a below-deck portion consisting of a communications console with an antenna control unit, and teletypewriter and telephone outlets.

Chairman McConnell's speech *(continued)*

nautical satellite services. The total of about $300 million for our capital expenditures in 1974 and for our future commitments is a true reflection of the faith we have in our satellite technology and our determination to put it to a productive use.

Two of our new programs are now nearing the operational stage. One of them is the MARISAT program. The initial satellite in this projected five-year developmental program is planned for launch this summer and will be positioned over the Atlantic Ocean to provide maritime communications services to the U. S. Navy and commercial shipping interests in that region. A second satellite is planned for service in the Pacific area later in the year.

The investment in this program is expected to total about $100 million, COMSAT GENERAL's share of which is approximately $80 million. The success of this venture depends upon the extent of the Navy's utilization of the system and our ability to develop a substantial market in the commercial shipping industry.

We, of course, have had for some time a contractual arrangement for service to the Navy, and I am happy to be able to announce that we are now beginning to receive orders from the commercial shipping industry.

Last month, SEAGAP, an oil exploration consortium led by the Phillips Petroleum, agreed to lease from COMSAT GENERAL a shipboard terminal for use on a seismic vessel named the *Deep Sea Explorer*.

COMSAT GENERAL is now also in the process of finalizing a contract with EXXON Corporation for a number of ship terminal units to be used on EXXON affiliated tankers at the inception of the MARISAT system. The willingness of this major corporation to take such a step forward in MARISAT communications represents a significant milestone in the MARISAT program. Details regarding the impending contract with EXXON will be released at a later date.

We are pleased with this beginning.

The other more significant program nearing the operational stage is our contract with American Telephone & Telegraph Company to lease the capacity of three satellites for domestic communications. These satellites are known as the COMSTAR I satellites—the first of which should be in operation during the early part of 1976. COMSAT GENERAL's investment in this project will total about $182 million, and our revenues are estimated at about $315 million, assuming a 7-year life period for each of the satellites.

Last year, COMSAT GENERAL was selected—over keen and aggressive competition—to participate with the European Space Agency and the Canadian government in the provision of the space segment for a program—known as AEROSAT—to test and evaluate the use of satellites to assist aircraft flying transatlantic routes. I think our selection in this competition was a real judgment of our expertise in the field of satellite communication as well as the skill of our management in presenting these facts. COMSAT GENERAL has a 47% ownership interest in this joint venture, and it is estimated that its investment will total about $70 million. COMSAT GENERAL will lease its share of the satellite capacity to the Federal Aviation Administration under terms that will be negotiated. It is expected that a construction contract will be awarded during the first part of 1976, and that the first satellite will be launched by December, 1978.

Our most current new business possibility, as you have seen in the newspapers, involves COMSAT GENERAL's proposed joint venture with IBM in the domestic satellite market. You may recall that earlier this year the FCC declined to approve the specific joint venture arrangement we proposed, but the Commission did offer COMSAT GENERAL and IBM several alternatives for entering the domestic satellite field. We and IBM are actively considering these alternatives along with various conditions imposed by the FCC. Since the matter is still in the discussion stage, it would be premature for me to attempt to predict the form or shape the business arrangements for such a venture might take. Let me just say that it is a prospect that is very much alive and of very substantial potential significance to your company in the domestic satellite field. It could be one of the most important and significant developments since our company was formed.

The new programs I have just reviewed are based, of course, on a need for the services they are to provide. But they also come from the initiatives taken by our management and staff and their dedication to two principal objectives, namely: the extension of satellite communications in the interests of the public, and the profitability of the business in the interests of our shareholders. With the continuation of such initiatives and dedication, and some good fortune, we trust that these objectives will be achieved.

I pledge to you that the company will put forth every effort and use every skill at its command to bring about these objectives.

President Charyk's speech *(continued)*

communicate directly with each other at the same time. Today there are 370 satellite pathways operating among 111 antennas located at 88 earth station sites in 64 countries.

The rapid expansion of the global satellite system and the increasing reliance of countries on satellites as a primary means of communication has resulted in a dramatic growth in the use of satellites. At the end of 1965, the year EARLY BIRD went into service, only 150 half circuits were being leased on a part-time basis in the global system, 66 of them by COMSAT. By the end of the first quarter of this year, 11,653 full-time half-circuits were being leased in the global system, 3,330 of them by COMSAT. This means that satellites are now carrying more than two-thirds of the world's transocean communications.

Although television accounts for less than 1.5 percent of COMSAT's revenues, this satellite use attracts perhaps the greatest attention since it brings the world into one's home

"Live Via Satellite" and is accomplished on a transoceanic basis only by satellites. It is estimated that about 20 million people watched the EARLY BIRD inaugural telecast on May 2, 1965 when the phrase "Live Via Satellite" was popularized. By July 1969, about 600 million people were able to share the excitement of Neil Armstrong's first steps on the moon. Now, it will be possible for more than a billion people—one out of every four persons on earth—to see the U. S. and Soviet Union astronauts on TV in July as they greet each other during the APOLLO-SOYUZ mission.

The dramatic growth in the use of satellites has been due in large measure to the ability to achieve large increases in communications capacity for relatively modest increments in basic investment. This results in a substantial reduction in unit costs. EARLY BIRD, for example, represented an investment of about $26,000 per circuit year. Through the technical advances that were incorporated in each succeeding generation of satellites the corresponding figure for the INTELSAT IV satellites has been reduced to about $1,700. This has made it possible for the satellite to contribute significantly to the reduction in charges for international communications. Prior to EARLY BIRD, the charge by the carriers to the public for a leased voice-grade half-circuit for service between the United States and Europe was $10,000 a month. Today that charge is $4,625—a reduction of more than 50 percent.

When EARLY BIRD first made possible the transmission of live TV across the Atlantic Ocean, the initial charge to the U. S. networks for a one-hour, peak-time, color transmission between New York and Paris was $22,350. Since then the charge has been reduced almost 80 percent to $5,100.

The satellite has truly placed high quality communications of all kinds within the reach of any nation.

There is, of course, a continuing need to expand and improve the global system to meet the rapidly growing demand for satellite services, and this is being done by introducing new advances in communications satellite technology.

The first of the three initial INTELSAT IV-A satellites will be placed in service in the global system later this year. Three more IV-A's are planned for launch beginning in 1977. These satellites will have a capacity almost double that of the INTELSAT IV's. Each of the IV-A's will have 20 separate communications units, or transponders, most of them operating in a narrow spot beam mode. The utilization of spot beam techniques will permit the same frequencies to be reused, thereby significantly increasing the communications capacity of the satellites.

The COMSTAR I satellites for AT&T's service will also have about double the capacity of the INTELSAT IV satellites. This increase, however, will be achieved through the use of a different technique known as cross polarization. In this concept, through the use simultaneously of horizontally and vertically polarized signals, the same frequencies can be used twice, thus doubling the effective capacity of the satellite.

The MARISAT satellites will introduce another unique communications capability. They will operate in three different frequency bands at the same time: UHF for Navy service between Navy-provided terminals and the satellites; L-Band for commercial maritime links between ships; and C-Band for commercial communications links between the satellites and the COMSAT GENERAL earth stations located at Southbury, Connecticut, and Santa Paula, California.

The program to test and evaluate satellites for aeronautical mobile communications involves still other technical innovations. These satellites will be designed to communicate in both the very high and the ultra high frequencies and to operate with very small antennas that are affixed to aircraft. An office, staffed jointly by COMSAT GENERAL, the European Space Agency and the Government of Canada, has been opened in Noordwijk, Holland, to carry out this program.

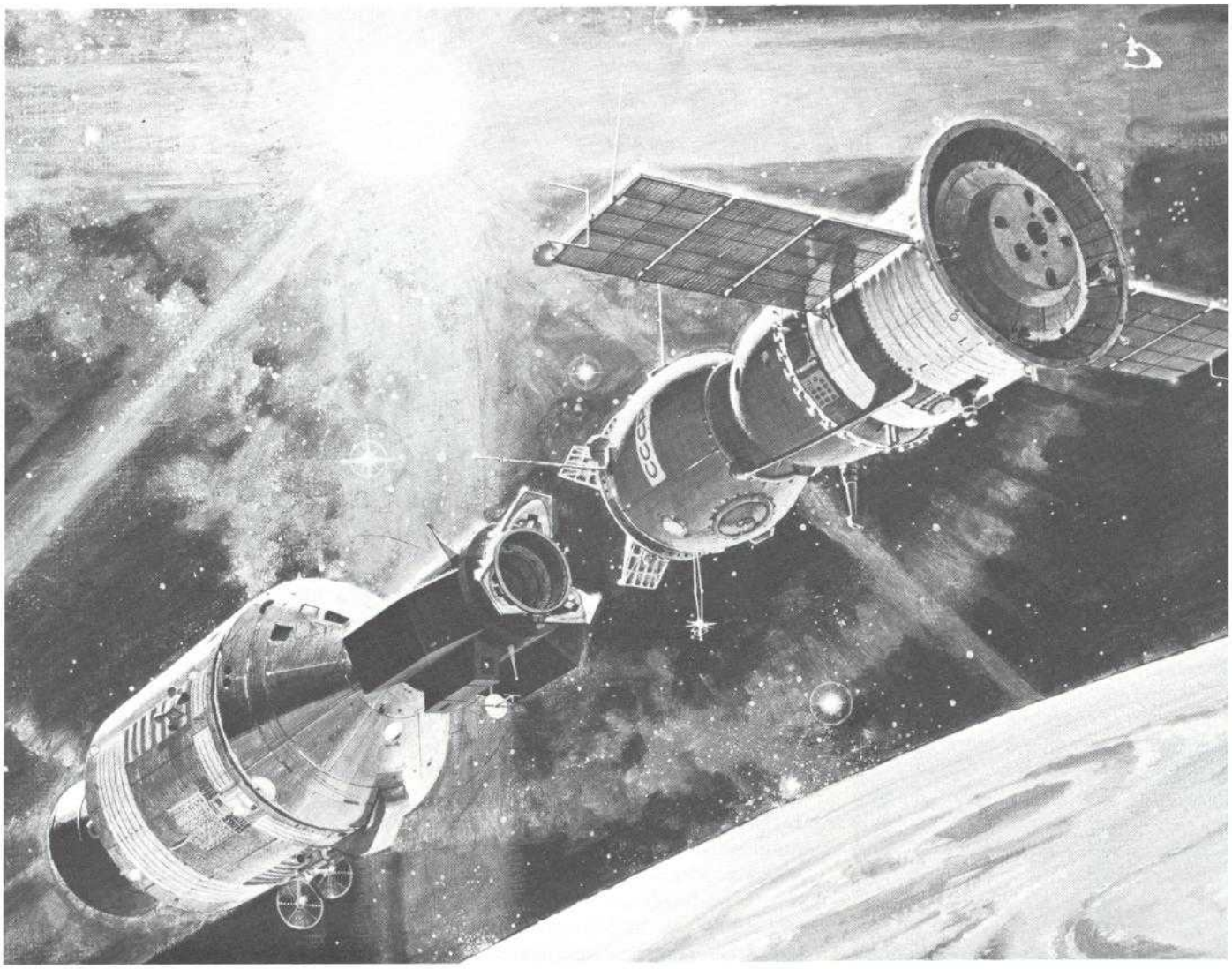
During the past year, the research and development programs of the COMSAT Laboratories continued to contribute to the advancement of satellite communications technology, including construction of new functional components, systems and subsystems. One important development was the invention of a new silicon solar cell which has a power output 50 percent higher than cells which were previously available. The Laboratories have also developed a nickel-hydrogen battery with a substantially longer life, higher reliability and lighter weight than the conventional nickel-cadmium batteries used in communications satellites. The new batteries will be used as the primary storage element in the Navigation Technology Satellite (NTS-2) to be launched by NASA for the U. S. Navy.

Two other important programs are directed toward obtaining experience with transmissions at frequencies higher than the 4 and 6 gigahertz bands now being used for satellite communications. In one of the programs, the Laboratories constructed a transponder which is being used in the NASA ATS-6 satellite to measure the effect of rain on satellite signals in the 13 and 18 gigahertz bands. In the other program, the Laboratories are building a beacon transmitter that will be used in the COMSTAR I satellites to conduct similar rain experiments in the even higher 19 and 29 gigahertz bands.

The exploitation of new potentials involving the interaction of satellite communications and data processing to provide new, better and more economical services is the objective of our proposed joint venture with IBM. We hope that we will be successful in finding a way in which such a system can become a reality.

Since EARLY BIRD went into commercial service, we have focused our attention on the dual objectives of developing new uses for satellite communications at the same time that we were participating in development of the global satellite system. In the field of international communications, where we were given a clear mandate by the Congress, our accomplishments have been impressive. In other areas, where authorization to undertake programs and the responsibility for them resides fully within the regulatory process, the progress has been much slower. Nevertheless, we have managed to obtain authorization to move out in the domestic, maritime and aeronautical satellite services fields in addition to our international services.

Many of the challenges and uncertainties we faced a decade ago are still with us, but we have matured as a corporation and this gives us reason to believe that we can meet the challenges of the future as successfully as we have in the past.



Robert McCall's drawing of the American and Soviet space vehicles in earth orbit as they prepare to dock. NASA PHOTO

Soviet-American mission TV comes to earth at Buitrago

Global system closes loop between Moscow-Houston control centers

COMSAT's Andover: an essential link in the chain

If all goes as planned, at around 1:20 p.m. EDT, Thursday, July 17, the circular hatches separating the Soviet SOYUZ with its two-man crew and the American-made docking module will be opened and Brig. Gen. Thomas P. Stafford, commander of the American APOLLO, will greet his counterpart Colonel Alexei A. Leonov commanding the U.S.S.R.'s space vehicle.

Mr. Peterson is Editor of the COMSAT News

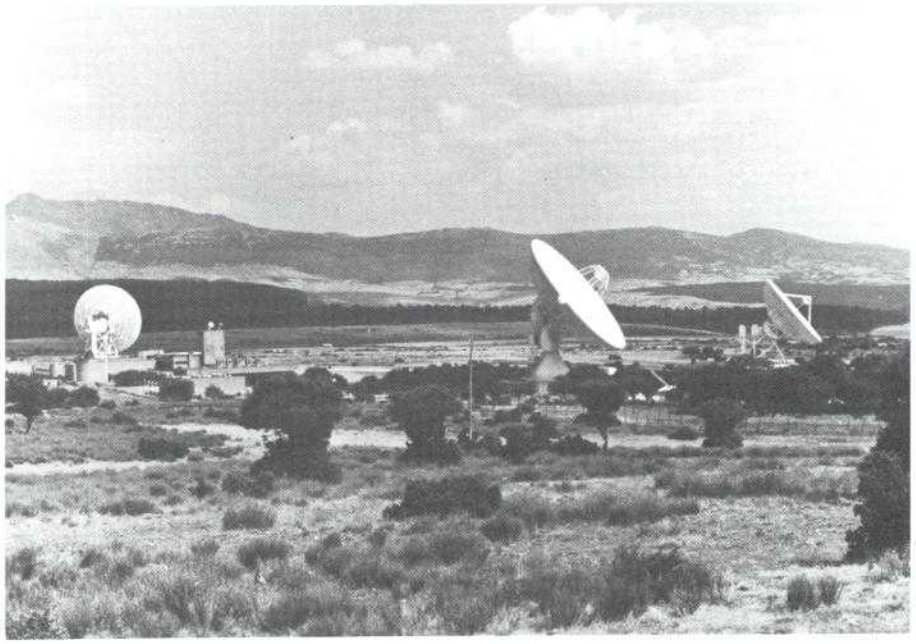
BY JOHN PETERSON

This will not be the first meeting of General Stafford and Colonel Leonov, nor the first meeting of American Astronauts Vance D. Brand and Donald "Deke" K. Slayton with Valeri N. Kubasov, the SOYUZ flight engineer. Over the past several years they have met often, at the Johnson Space Center in Houston, Texas, at the Soviet space center, Star City, near Moscow, and more recently at the Soviet launch site at Baykonur near Tyuaratam.

But the meeting on this particular day, at the end of a tunnel measuring a little more than 10 feet long and five feet in diameter (or, if you prefer, 3.2 meters by less than two meters) will be of special significance, significant in that the much heralded "space race" kicked off in April 1961 with the manned space flight of Cosmonaut Y. Gagarin culminated in a joint mission with spacecraft of both nations locked together nearly 150 miles above the earth's surface.

To the scientist with visions of penetrating further into space, APOLLO-SOYUZ offers little to stir the imagination, it is not a flight reaching out into the solar system to such unknown planets as Venus or Mars. To the aerospace engineer and the thousands of technicians involved, no great breakthroughs were required since the hardware was assembled primarily from "off the shelf" items. And there are those who consider the mission strictly a political feat. But in an era in which nations recognize more and more the need for advanced communications, the Soviet-American flight has to provide an outstanding example of the establishment of a communications network overcoming obstacles which a few years ago would have been considered insurmountable.

If five years ago someone had told Tom Stafford that he would be conducting a tour of the United States from his vantage point in space, in Russian, by live television, to the citizenry of the U.S.S.R., in his Oklahoma drawl, he would in all probability have told that someone that he or she was out of his or her mind—but that is what he will do.



The Spanish-owned earth station at Buitrago, approximately 50 miles north of Madrid, will be the key operational video link between the orbiting Apollo-Soyuz and the earth during the two days the Soviet and American space vehicles are locked together.

The Apollo-Soyuz Story, Communications

The big story of APOLLO-SOYUZ is communications. The "firsts" are innumerable. For the first time manned space vehicles will receive and transmit through another satellite, the ATS-6 (Applications Technology Satellite) poised over the Indian Ocean. For the first time live operational television will flow directly down into a commercial facility, a segment of the INTELSAT system, the Spanish earth station in Buitrago. For the first time there will be direct communication, voice-data-video, between NASA's Mission Control Center in Houston, Texas, and the U.S.S.R.'s Control Center in Moscow with Soviet and American technicians sitting side by side. And the litany of "firsts" goes on.

If one overlooks the difference in philosophies, politics, concepts and other such intangibles, common agreement is found in the recognition of the language barrier as the most formidable obstacle to be overcome. As one engineer put it, if duplicate systems in Russian and American had to be built into the spacecraft they couldn't have gotten them off the ground. So, mastery of both languages on both sides was a must if the mission was to be carried out.

The language barrier

John H. Temple, Operations and Procedures Officer of the Johnson Space Center's Flight Control Division, displayed the two heavy volumes, the end result of more than two years of work for him and other members of the Division. Entitled *Control Centers Interaction Plan* and *Onboard Joint Operations Instructions*, the two massive manuals, the second of which will be carried into space with the crews, spell out in both languages each step in the two-day joint exercise and in detail the interaction between Mission Control in Houston and in Moscow.

"We have tried to foresee not only each step in a nominal mission but also the unusual," said Temple. "What we wanted to make sure was that we had a very clear understanding of interfaces we needed to work out between our two countries both in terms

APOLLO-SOYUZ Highlights

Day	*Date*	*Time/EDT*	*Time/CDT*	*Event*
Tuesday	**July 15**	8:20 a.m.	7:20 a.m.	Soyuz launch
		3:50 p.m.	2:50 p.m.	Apollo launch
Thursday	**July 17**	11:14 a.m.	10:14 a.m.	Rendezvous
		12:15 p.m.	11:15 p.m.	Docking
		1:02 p.m.	12:02 p.m.	1st transfer
Friday	**July 18**	4:59 a.m.	3:59 a.m.	2nd transfer
		11:08 a.m.	10:08 a.m.	3rd transfer
		3:06 p.m.	2:06 p.m.	4th transfer
Saturday	**July 19**	3:59 p.m.	2:59 p.m.	Separation
Monday	**July 21**	6:51 a.m.	5:51 a.m.	Soyuz landing
Thursday	**July 24**	5:18 p.m.	4:18 p.m.	Apollo landing

Approximate time of missions: Apollo—nine days
Soyuz—six days

of detailed procedures and in agreeing on types of information required to be exchanged between the two Control Centers."

Swiveling around in his chair in his small office on the second floor of the Flight Operations Building, he looked across the wide expanse of green lawn at the massive sprawling Control Center bearing the internationally recognized designation "Building 30" and continued.

"It wasn't just a simple case of translation, Russian into English and vice versa, we also had to work out technical problems. Both countries, in varying degrees, had different ways of doing things and we had to mesh the two and make them compatible with each other. Let me give an example. In preparing to do air-to-ground communications with the spacecraft we would check out the 'end-to-end' system, that is, from the console of CapCom (Capsule Communicator) in the Control Center all the way through to the remote site in communication with the spacecraft.

"The Soviets tend to prefer just the interface between the two Control Centers. The result was a compromise with joint verification between the Control Centers and each Center checking out its link with its ground station. Although we changed the system a bit we still ended up with end-to-end verification."

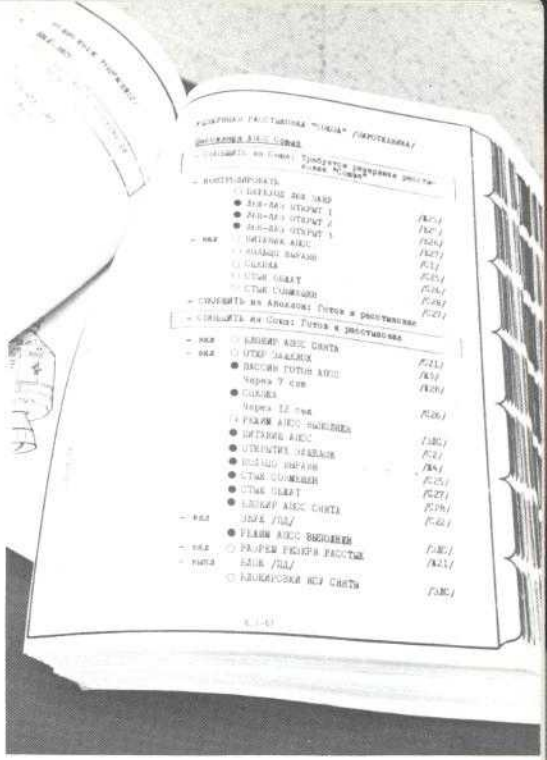
Temple also pointed out that in many instances simple translations were not enough because procedures when translated did not necessarily mean the same thing to each other, then it was up to the translators and interpreters to overcome the difference. Many times a single word took on tremendous importance in its translation or interpretation. But the result was a simulated flight in real time in which the immense amount of work that went into the two documents proved their validity and a credit to the efforts of Soviet and American engineers, technicians, translators and interpreters.

A studio in space

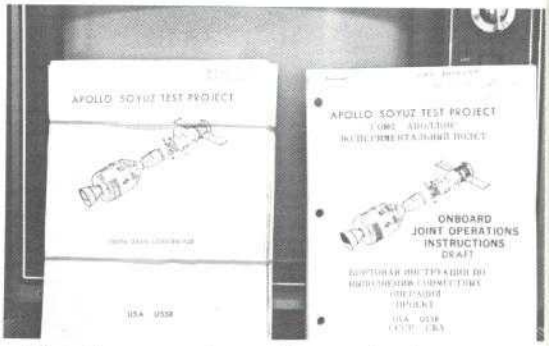
The mission of SOYUZ will end after approximately six days of flight. The American crew will continue on in orbit for another three-plus days. Give or take a few minutes one way or the other, NASA has scheduled 30 hours of operational television most of which will focus on the two days of joint activities. During these two days, to exercise literary license, the interlocked flight modules will become literally a television studio in space. The Astronauts and Cosmonauts, actors on the stage must, with one exception, also perform as camera crewmen in setting up camera equipment.

As Stafford and Slayton make their way through the short tunnel separating APOLLO from SOYUZ, TV cameras will record their movements. The Docking Module has three locations for the mounting of TV cameras, two at the SOYUZ end and one at the APOLLO end. Portable cameras can be mounted by crewmen in accordance

(continued on next page)



A closeup of a page of the Joint Instructions to be used during Apollo-Soyuz with procedures translated into Russian.

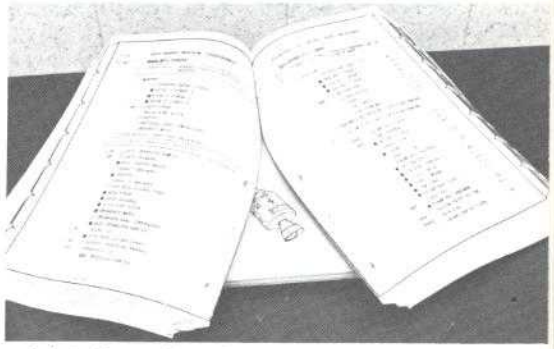


The two massive volumes to be used for the Apollo-Soyuz mission—the result of more than two years of development.

Working Groups hammered out the system

For the past several years five Working Groups made up of American and Soviet scientists, engineers and technicians have jointly cooperated in specialized areas: Working Group One concerned with experiments, trajectories, simulations and contingency plans; Group Two, control systems and docking targets; Group Three, docking systems; Group Four, flight communications systems; and Group Five, life support systems.

The final ASTP Working Group meeting held in the United States earlier this year involved approximately 80 Soviet aerospace specialists and their American counterparts. The Soviet contingent included Academician Boris N. Petrov and the U.S.S.R. Project Technical Director, Professor Konstantin D. Bushuyev. One other major meeting of the Groups was held in mid-May in Moscow in conjunction with the joint flight readiness review. The only Soviet aerospace specialists scheduled to come to the United States after this series of meetings are those participating in simulations and the flight itself.



Joint Operations Instructions to be carried by the Astronauts and Cosmonauts are spelled out in both English (left page) and Russian (right page).

with their flight plan. Although the crew mounts and activates the cameras, Mission Control in Houston selects the scenes to be televised and controls the cameras, in similar fashion to the operation of the camera on the Lunar Rover on the moon's surface.

Since the first transfer will take place roughly at midday in the United States and in the evening in the Soviet Union, viewers around the world will be able to tune in on a televised historic first, the exchange of greetings and gifts between the crews of the two countries while in earth orbit.

Dinner, then to work

A little more than an hour after the beginning of the first transfer, Stafford and Slayton will have joined Leonov and Kubasov in the SOYUZ leaving Brand in the APOLLO. Prior to conducting the first experiment, the two crews will settle down for dinner (literary license again). To American viewers, accustomed to watching their Astronauts squeezing assorted food combinations out of tubes, the first meal will offer a real change in the dining pattern.

Unlike the APOLLO Command Module, the SOYUZ Orbiting Module contains little of the equipment characteristic of the American space vehicle, consequently, as Astronaut Gene Cernan pointed out to newsmen recently, "On the television you're going to think it's the size of your living room." For the first formal meal together, the four space men will squeeze around a small table and bench arrangement stowed in the Soviet vehicle for a hot meal. Two cameras mounted in the SOYUZ, a Soviet black and white camera and an American color camera will record for television this TV "first". After the symbolic sharing of food the five crewmen will begin a series of experiments, unilaterally and bilaterally, which, for the two-day period will involve the mingling of the two crews for more than 18 hours before Stafford backs off from the SOYUZ, bidding a final farewell to the two Cosmonauts as the hatch of the Soviet vehicle is closed and locked.

No attempt will be made in this article to describe the activities of the crews in detail during their two days of joint operations. Although the Flight Operations Plan specifies four "transfers", the easily disoriented (such as myself) could very easily get confused in determining which Astronaut or Cosmonaut was crawling in which direction to conduct which experiment in which space vehicle. Besides, this minute-by-minute adventure will in all probability be carried in great detail in the media and as it happens on TV.

But back to the Communications aspect of the mission. Although ASTP (APOLLO-SOYUZ Test Program) will have its beginning on the Baykonur launch site with the liftoff of the SOYUZ, followed seven and a half hours later with the Apollo launch from the Kennedy Space Center in Florida, to the world public the flight will have its beginning as the two vehicles come together in earth orbit, shortly after noon Thursday, July 17, on the twenty-ninth revolution of Apollo.

The American Astronauts and Soviet Cosmonauts plan to exchange flags and pine tree seeds, joint medallions and placques and sign certificates when they meet in space. A little more than three hours after docking of the two spacecraft *Apollo* Commander Stafford and Docking Module Pilot Slayton will transfer to the *Soyuz* where the symbolic gestures will take place.

Closing the loop

Focusing on the communications characteristics of the mission, during a recent visit to the Johnson Space Center in Houston, interviews were conducted with engineers involved in the complexities of the network established to support the flight. The following questions were answered by Charles W. Busch, Head, Communications Operations Integration Plans at JSC (Although Mr. Busch has retired since this interview, my appreciation to George Metcalf, his successor, for reviewing and contributing to the content of the following material—Ed.).

Question: What basically is the difference in communications between previous APOLLO and SKYLAB missions and the APOLLO-SOYUZ flight?

Busch: There are two differences in communications essentially. First, this is our first adventure into downlinking through a satellite, the ATS-6, instead of going directly to a ground station. The second is the establishment of a total end-to-end communications system between the U.S.S.R. Mission Control Center and ours here in Houston.

The latter is a communication system capable of passing TV in each direction, teletype, telex, facsimile and voice. As far as data is concerned we will exchange that which can be reduced by computer and transmitted by normal teletype format.

Spacecraft to satellite

The reason for using the ATS-6 is the additional coverage we get. An earth station can handle only about six minutes of acquisition and then there would be a long break to get to the next earth station. With the ATS-6 we get the better part of each hour of communications with the spacecraft. Although we will not get constant coverage we will probably get 40 minutes out of each hour as compared to, say, six-minute passes during SKYLAB.

Question: What's the difference between sending signals, sending TV down to an earth station and sending it to the satellite? Doesn't it present a bigger problem sending it to the ATS-6 than to one of your tracking stations on earth?

Busch: No. First of all, the satellite is capable of receiving S-band which is what the normal ground stations of NASA would. And then it's sent by C-band from the satellite down to the earth. The only restriction is that there are only two ground facilities that can handle it, one of them is an allocated antenna facility at your commercial Buitrago earth station, in Madrid, and the other one is a sort of a van-like affair right on the site of the ground station.

So, in order to monitor the experiments and the activities during this flight, the TV has to come down into Madrid. We will have the capability, however, for video recording which will be dumped when passing near an earth station. Specifically, the only

Soviet Engineer Gennadiy I. Vlasov, Chief of Research at the Leningrad Research Institute of Television, takes part in docking simulations at Houston, Texas. In this photograph he is checking out procedures for transferring the color TV camera between the Soyuz and the Docking Module. NASA PHOTO

way we're going to get live TV back then is through Buitrago, primarily, or by way of the NASA tracking station in Madrid, then to Buitrago and back over the Atlantic Ocean INTELSAT satellites.

TV between U.S. & U.S.S.R.

The other significant thing about the mission as I've said is the TV being sent to and received by us from Moscow. About everything that comes down is also going to be sent out to Moscow. It comes to Madrid, back here by satellite through Andover, then back over the satellite to Raisting, Germany, for further transmission into the Soviet Union.

Incoming TV is in black and white and it is brought back to Houston for color conversion.

Question: Why the requirement to move everything through Raisting?

Busch: The controllers at the Moscow Earth Station are going to want to see all of this live and in real time. So we'll retransmit it back through Andover to Raisting where the Soviets are going to pick it up. One of the reasons Raisting's important to us is that our TV, when it leaves Houston, is in NTSC format, National Television Standards Code. In such format it's not usable to them, any more than theirs is usable to us. As an example, our TV is at 545 lines and at 60 cycles. Theirs is at 625 lines and at 50 cycles, consequently conversion is necessary. Raisting is one of the converting points. Two steps are required in the conversion. The Soviets' basic system is called SECAM. Europe's basic system is PAL. So the first conversion that's done is done at Raisting and it's to take it from the NTSC format or PAL. But that's still not useful to the Soviets so the next conversion that's performed is the transcoding into SECAM. Now it's useful to them. The exact reverse process takes place with TV received from Moscow. So Raisting was chosen because of its land line facilities, in and out, and its past performance record.

The Soviets are not completely dependent on us for live TV. While they're passing over the U.S.S.R. mainland their black and white TV camera on board the spacecraft can be monitored in their control center.

A workable system

Question: How did you go about working out a mutually acceptable system with your Soviet counterparts?

Busch: Over the past two years we've conducted extensive interchange with them with joint meetings between their communicators and ours. And although there were many challenging problems to overcome there were fewer in mine because the Soviet representative spoke beautiful English and had the ability to comprehend quickly. So, whereas other people had a lot of problems in the language area, I didn't. They had to use interpreters. They assigned me an interpreter and I gave him back.

But there was one area of difficulty. In order to draw a schematic diagram of an end to end circuit flow you've got to know basically what's at the other end of the tunnel. And it was difficult for us to obtain this information. Largely because our Soviet representative, who was associated with the Ministry of Communications,

had never been in the U.S.S.R. Mission Control Center so we had to put the first part of the system together by imagination. Later on we were joined by Dr. Shibanov, who enjoys the same position at the Mission Control Center as I do here, and he was able to fill in the gaps.

During the December 1974 simulation we were able to actually wring the plan out at which time we uncovered deficiencies in our planned interface and corrected them.

Question: So in the planned stage the language barrier didn't present too difficult a problem for your particular people, but how about in actual operations?

Busch: In actual operations we use interpreters at our switchboard here, in our air-ground operation and in our television operation, just as they do at the other end. So in the broad sense of the word, we have a double check. But just because you have interpreters you're not necessarily home free because in communications we have a jargon of our own, and it's completely different from the norm.

Unfortunately it's not international, so we had to give a little. There is an international book out that's sort of a guideline for the whole world to follow with suggested rules for international telecommunications. By incorporating some of those terms, then adopting some the Soviet communicators normally use and some of ours, between us we made up a standard phraseology which we had our interpreters study and which we try to use at all times, and it's worked very well.

The basic nomenclature, megahertz, gigahertz, cycles, bits per second and so on mean the same to them as they do to us but once you're finished your quality checks of your

Communicating with Apollo-Soyuz

The following is based on a discussion with Edward I. Fendell, Head, Communications Section, Flight Control Division, Johnson Space Center, Houston, Texas.

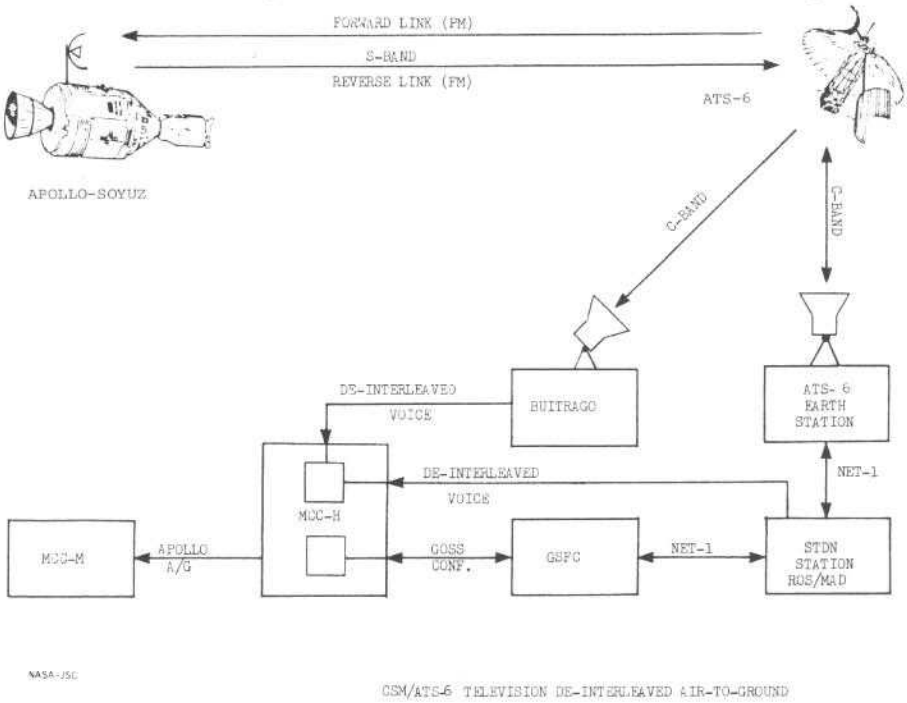
Mounted on the outside of the APOLLO Command and Service Module there is a high-gain antenna used during APOLLO missions to transmit and receive signals during journeys to and from the moon and to receive television. Houston has modified that antenna, changed the frequency but still kept it within the S-band frequency range, and provided a two-way link between the ATS-6 satellite and the ASTP (APOLLO-SOYUZ Test Project) spacecraft.

Air-to-ground communications are a bit of a mixture. In a command voice "up" mode the telemetry and voice link will be by a new 21-foot mobile unit located at the NASA Tracking Station in Madrid. In the television mode, both TV and voice will come down through the ATS-6 to Spain's 95-foot antenna at Buitrago for further routing over an Atlantic Ocean INTELSAT IV to the COMSAT earth station at Andover, Maine, then to the Goddard Space Center and on to Houston, Texas.

A difference between ASTP and previous missions, according to Fendell, is that communicators will not be able to use all of the system modes they normally do. For example, the normal operation is in what is called PM mode and FM mode which operate simultaneously and over which telemetry and TV are acquired at the same time. In ASTP, however, this capability is restricted.

With the ATS-6 satellite communicators can choose from among the following options, real time television and real time voice, delayed time television and delayed time voice, delayed time telemetry with real and delayed time voice, and real time and delayed time scientific data. When over a ground station communicators can select any combination of these and will be doing so throughout the mission. On the ATS-6 they will be restricted to the use of one of these modes. Consequently, use of the ATS-6 for live television and real time voice while over Madrid excludes the other modes with telemetry not capable of being acquired, recorded and dumped at another time.

To pose an actual situation, consider Houston has acquisition through the satellite while the spacecraft is over the Merritt Island Station in Florida. At this point in time there will be TV on the satellite with telemetry being received through the ground station. Then the spacecraft passes over Bermuda. Over the ATS-6 there'll be TV while through Ber-



GSM/ATS-6 TELEVISION DE-INTERLEAVED AIR-TO-GROUND

voice long lines you're not terribly concerned with that anymore. From there on in you're establishing calls from flight controllers at this end to flight controllers at that end, from the flight director here to the flight director there.

A lot of work has gone into making sure the controllers, both Soviet and American, in Moscow and here in Houston, have reached the point of understanding each other's technical terminology.

We spent months working over a conference table, working with the same people we would be working with during the mission. Two-week meetings stretched into month-long meetings. So, theoretically, nothing should come as a surprise. We have joint documentation signed off and agreed to by both sides. The only thing is, you can throw them a curve if you don't watch your terminology, if you lapse into American idioms and jargon along with the technical jargon.

Initially concerned

When we first got underway I was pretty concerned because it looked like every one in our group required to communicate with them would have to learn Russian, to go to a crash language school. Their providing interpreters eliminated this concern.

Consequently, there were no essential modifications required in the APOLLO, the SOYUZ, or the control centers. The astronauts and cosmonauts were taught each other's language. As a matter of fact that's really the name of the game in this mission, when our astronauts talk to their cosmonauts they'll talk in Russian and when the cosmonauts talk to our astronauts they'll talk in English. And if there is any lengthy relaying of information required we will use interpreters assigned to dynamic positions.

Question: So far we have pretty much been discussing the relay of information between individuals, were organizational changes required?

Busch: Yes. There were some changes made. A crew designated JDS (Joint Documentation Systems), provided under contract by Kentron Limited of Hawaii, will be used. They'll provide translators for us so that when contact, facsimile, and telex messages are transmitted back and forth they can do a very rapid translation job. But then, it's not just a simple task of translation because you just can't do a translation job on written Russian and then send it out over an American Keyboard. The Russian alphabet contains different characters from ours. So another function has to take place and that's called transliteration. This is where you come onto a character for which there is no similar character in the other's language and the character has to be literally disassembled and reconstructed to develop a character having the identical meaning in the other's language. And again, this is a two-way process. Transliteration then, is one more procedure we have that we didn't have before.

Simplifying procedures

To further simplify procedure, flight controllers have anticipated certain types of status reports and messages that are going to be required and mutually agreed on a format so much of the message will always look

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muda Houston will be giving them real time telemetry and voice on the PM link with the spacecraft dumping delayed time telemetry and voice over the FM link. While over Madrid the ATS-6 will be restricted to the single mode of live TV and real time voice while the NASA Tracking Station will be receiving real time telemetry and voice and previously stored data.

"The decision made to use the Spanish station at Buitrago for TV," said Fendell, "was because of its circuit margin capability, in other words, Buitrago has the bigger dish and, frequency-wise, it matches up with the ATS-6."

As far as the selection of what to bring back during the two days the crews are working together, communicators will be able to choose activities over four cameras capable of being plugged in at locations in the APOLLO Command Module, the Docking Module and the SOYUZ Orbiting Module. First, the cameras will be turned on and the video fed into a central system. Although the crew will actually turn on the cameras the video selection will be based on mission requirements and ground-controlled just as it was on the lunar surface except, instead of moving the cameras up and down and left and right as was done previously, controllers for APOLLO-SOYUZ will be selecting the view from the desired camera.

The Soviets will also have the capability of monitoring their crew directly over a camera mounted in the SOYUZ. This is a U.S.S.R. camera, however, and does not come through the NASA network. NASA's camera selection capability in the SOYUZ is through one of the U.S. cameras to the ATS-6.

The real task in APOLLO-SOYUZ is the collection of the massive amount of data such as experiment data, real time systems data, vehicle analyzation data, and television, simultaneously, over the satellite and over the ground. It will be a tremendously difficult job to make sure no data is lost.

"I suppose the question must be raised," concluded Fendell, "why depend so much on the ATS-6 when the modes of communication are more restricted. During SKYLAB we flew at around 210 nautical miles. In ASTP we'll be at about 100 nautical miles. The lower the orbit the shorter the pass over an earth station. Whereas previously, a pass over an earth station such as the Merritt Island Station might give us eight to 12 minutes of acquisition, ASTP's lower orbit will give us, say, four to six-minute passes. Consequently, our coverage would be less.

"In SKYLAB, over a network of a few less tracking stations, we had a 37 percent coverage out of a 24-hour day. If we took the ATS-6 out of the flight, with a few more stations, we'd still only get about 17 percent coverage. But, by using the ATS-6 we increase our coverage to about 55 percent. There will still be periods during which we will be out of contact with the spacecraft but nowhere nearly as much as if we were not using the satellite."

the same, only a parameter or a condition that might have changed. They're not going to be random, rambling type messages, but terse and in pre-determined form. Basically, the same procedure will apply to voice communications in which interpreters are involved.

And, as I said earlier, we've come up with a huge dictionary of common terminology, at least a mutually agreed upon terminology, which the interpreters are frantically memorizing.

Now, on the air-ground loops, which are the really important ones, there is an interpreter who has a key set with all listen buttons except one. On this one he is doing a live United Nations type of interpretation over it as it happens. Again, this is an extra effort to eliminate any confusion.

Let me try to summarize the communications system we'll be using. Basically, what we'll have between the Soviets and ourselves is two-fold, duplex, teletype service, and 13 voice circuits two of which are capable of instant conversion into facsimile for sending pictures back and forth. In addition we will have a transmit and a receive television line between control centers over the satellites.

As I said before, the TV communications between control centers will be via satellite, the voice circuits will be split, probably about 50/50. But Public Affairs will be using the satellites for both TV and voice. They felt in many cases that the information they were getting might be following a TV program and so deliberately routed it by way of satellite to maintain lipsync integrity. Another reason is that we've had tremendous success with satellites particularly through APOLLO and SKYLAB, just beautiful. We have about two days of this mission that are extremely critical in terms of Public Affairs, fantastic events going on, the first handshake and all that sort of stuff. We want to make darn sure that we get it.

Switchboard system

Question: You mentioned a specific number of voice circuits, how will these be controlled?

Busch: We are planning to use a switchboard system which is a new departure for us. Previously, in our own network, we used dedicated circuits with a dedicated loop but the cost of long lines between here and Moscow is so prohibitive that we had to reduce the total number of long lines and used the shared customer type of operation. In other words, if a member of one of our flight control teams wants to talk to a member of one of their flight control teams, instead of just a shotgun system like we used in SKYLAB we would come to our switchboard and ask to be connected to an individual by name at the other end.

One of the four color TV cameras capable of being mounted in the space vehicles can be seen in position in the Soyuz Orbiting Module over the shoulder of Soviet Crew Commander Leonov during simulations at the Johnson Space Center. NASA PHOTO

It's similar to person-to-person. When he's finished, he's off and a new customer comes on. We'll have 13 such voice lines. That's our mission number. These are dedicated lines. Our flight director has a dedicated line and there are dedicated lines for air to ground operations, for crew-to-crew voice and crew-to-ground voice. And, to a certain extent, our Public Affairs has a dedicated line. But the rest are general customer service. We've found this to be considerably cheaper.

Question: It may be cheaper but does it work as well?

Busch: Our initial experience in December indicates that it works just as well. We originally got the idea when President Nixon visited there. His staff had determined that he needed a considerable number of long lines but the Soviets talked them back to five and he found he could operate very well.

Troubleshooting

Question: What happens if you have a breakdown somewhere in the system?

Busch: Troubleshooting is more difficult than ever before. Fortunately, we've got the cooperation of EBU, the European Broadcasting Union, which is accustomed to sending news back and forth over the satellites. They've been drawn into the net as our European troubleshooter for TV going to Moscow. EBU will make sure all of the testing is done segmentally and get us a composite package. Without their assistance we could really have problems.

For example, we could find out very quickly if the problem was New York down to Houston, and we've split the circuits so that they go through either Madrid or London NASA stations, consequently, we can really pin down the problem between here and Europe. A difficulty which would concern us would be one developing in the terrestrial lines between Raisting and Moscow, not in getting an acceptance of responsibility but in getting status. Where is the problem? When will it be fixed? This takes time. We're not dealing with a single communications entity in a single country, we're dealing with several of them and each one has to be dealt with separately. Wherever possible, we've injected NASA Stations into the loop so that by using the station manager and his interface with the telephone company and ours here, we can identify the problem quickly.

Question: One final question. How would you summarize the relationship you've established with your Soviet counterparts?

Busch: From a personal point of view the relationship we developed made the whole effort worthwhile. And you know the most interesting thing we discovered was that on both sides we had sons who needed haircuts and kids who listened to much too loud music. We found we had things in common and we became friends.

DIGISAT service request filed with FCC

COMSAT has filed a request with the Federal Communications Commission for permission to provide DIGISAT service in the Atlantic Ocean area.

DIGISAT, COMSAT's new satellite data channels, will be offered by COMSAT at speeds of 2.4, 4.8 and 9.6 kilobits per second. Service will be provided from the Etam, West Virginia, earth station to various points in the Atlantic Ocean region. It is anticipated that the service will be provided initially between that station and stations in the United Kingdom and Spain. Service to additional countries in the Atlantic region, including countries in South America, will be offered as soon as appropriate arrangements can be completed. The DIGISAT channels will interface with any terrestrial analog voice channel operated via International Telecommunications Union (ITU) standards.

International data users will now have available through DIGISAT an advanced, economical, high quality alternative for meeting specific data transmission requirements. Present use is limited to analog channels which are less efficient and generally require special conditioning.

COMSAT's tariff to the U.S. record carriers for such service will be at the rate of $1,200 a month for a 2.4 kb/s channel, $1,440 for a 4.8 kb/s channel and $1,920 for a 9.6 kb/s channel. This represents a significant economic breakthrough for users. COMSAT's current rate for analog (AVD) channels in the Atlantic region is $2,850 per month.

DIGISAT service is presently offered between the United States mainland and Hawaii.

Head of ESA's Washington office visits INTELSAT

Wilfred Mellors (right) head of the Washington office of the newly-formed European Space Agency (ESA), is greeted by Santiago Astrain, Secretary General of INTELSAT at INTELSAT Headquarters in Washington. ESA was created officially on May 31, 1975, with its headquarters in Paris, France. ESA has 10 full member nations and three associate members. The new Director General of ESA is Roy Gibson of the United Kingdom. The new agency succeeds both the European Space Research Organization (ESRO) and the European Space Vehicle Launcher Development Organization (ELDO).

COMSAT reports first quarter earnings; regular quarterly dividend declared

COMSAT has reported consolidated net income of $12,692,000 for the first quarter of 1975, equal to $1.27 per share, compared to $10,891,000 or $1.09 cents per share for the first quarter of 1974.

The Board of Directors of COMSAT, at its monthly meeting, declared a quarterly dividend of 25 cents per share, payable on June 9, 1975, to all shareholders of record as of the close of business on May 9, 1975. This is COMSAT's 19th consecutive quarterly dividend, and the fourth at the rate of 25 cents per share.

Net operating income for the first quarter of this year was $10,766,000 or $1.08 per share, compared to $8,825,000 or 88 cents per share for the first quarter of last year.

Operating revenues for the first quarter of 1975 amounted to $36,475,000, compared to $32,380,000 for the first quarter of 1974. The increase in revenues over those in the first quarter of 1974 resulted largely from the fact that in the first quarter of 1975 COMSAT leased more full-time half-circuits to its carrier customers for overseas communication via satellite than it did in the first quarter of last year.

Since February 15, 1974, U.S. mainland-Hawaii service has been provided on a bulk basis at a fixed monthly charge, rather than on an individual leased half-circuit basis. Excluding U.S. mainland-Hawaii service, the number of full-time half-circuits leased as of March 31 of this year totaled 3,330 compared to 2,901 leased at the same time a year ago.

Operating expenses, including income taxes of $10,862,000, were $25,709,000 for the first quarter of 1975, compared to operating expenses of $23,555,000, including income taxes of $9,069,000, for the first quarter of 1974.

Other income, after provision for income taxes, amounted to $1,926,000 for the first quarter of this year, compared to $2,066,000 for the first quarter of last year.

Ten-year awards presented

Awards were presented recently to COMSAT employees completing 10 years of service with the Corporation. Pictured, left to right: Robert Strauss, Frederick N. Ormsby, George P. Sampson, Nathan Tonelson, H. William Wood, M. Carol Smith, COMSAT President Joseph V. Charyk presenting the awards, Kathleen Johnston, James R. Dunn, Ruth Kupperschlag (INTELSAT), Paul W. Eckley, Jr., Francis J. Burkitt, George A. Lawler, Robert C. George and Hale Montgomery. Also receiving awards but not present for the ceremony were Richard R. Colino and Jean M. Sephton.

Brenda Lister elected to National Board

Brenda J. Lister, COMSAT Corporate Training Administrator, was elected to a one-year term as a National Board Member of the American Society for Training and Development (ASTD) at the recent National Conference in Las Vegas, Nevada.

ASTD is the national society of professional training personnel with a membership of over 10,000 persons, representing more than 4,000 organizations and companies, both national and international. The mission of ASTD is to benefit the professional growth, competence, and effectiveness of its membership in meeting their responsibilities for the training and development of today's workforce.

Ms. Lister was elected Chairperson of the Women's Caucus at the Conference and in this capacity becomes a member of the Board. She succeeds Ms. Kate Kirkham from NEA. Other Board Members include Leopold A. Hauser and Richard H. Marcotte of American Airlines; John J. Collings of Scott Paper Co.; J. Norton Dunn of Reuben H. Donnelly; George S. Odiorne, Dean, College of Business, University of Utah; Ms. Jan Margolis and Donald R. Botto, Goodyear Corp.

Levatich to monitor technical support to AEROSAT SPO

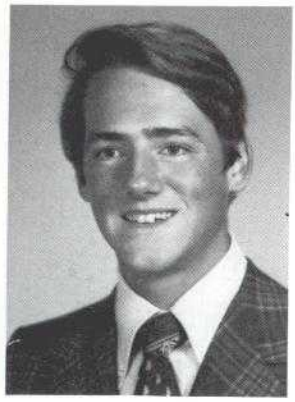
J. L. Levatich has been appointed to the newly created position of Assistant Program Manager, AEROSAT System, reporting to E. J. Martin, Program Manager, Mobile Systems, according to John L. Martin, Jr., Vice President, Systems Development and Operation, COMSAT GENERAL.

His principal responsibilities will include monitoring and arranging for technical support to the AEROSAT Space Project Office and managing the technical and operational arrangements associated with COMSAT GENERAL's AEROSAT services to be provided to the FAA.

Mr. Levatich joins COMSAT GENERAL from COMSAT Laboratories where he has held various managerial and technical positions. Prior to joining COMSAT he was employed by MITRE Corporation and Bendix. He holds a Bachelor's Degree in Electrical Engineering from Rensselaer Polytechnic Institute and an M.S.E.E. from Johns Hopkins University.

COMSAT Graduates
1975

Pictured on this and the following two pages are 1975 graduates, sons and daughters of COMSAT and COMSAT GENERAL employees.



Robert W. Adams, son of Mr. and Mrs. Robert W. Adams, Sr. (Headquarters), Oxon Hill Sr. High School, Oxon Hill, Maryland.

Michele Elizabeth Brooks, daughter of Mr. and Mrs. C. K. Brooks (INTELSAT), B.S. in Interior Design, University of Maryland, College Park, Maryland.

Cynthia A. Corpuz, daughter of Mr. and Mrs. Castor R. Corpuz (Paumalu), Kapiolani College, Honolulu, Hawaii.

Ivan K. Daikoku, son of Mr. and Mrs. Yoshiaki Daikoku (Paumalu), Kamehameha High School, Honolulu, Hawaii.

Karen Louise Ebelink, daughter of Mr. and Mrs. John Ebelink (COMSAT General), Paint Branch High School, Burtonville, Maryland.

Laura Ann Formella, daughter of Mr. and Mrs. John Formella (Etam), Valley High School, Masontown, W. Virginia.

Kenneth M. Forrester, son of Mr. and Mrs. Daniel D. Forrester (Labs), High Point High School, Beltsville, Maryland.

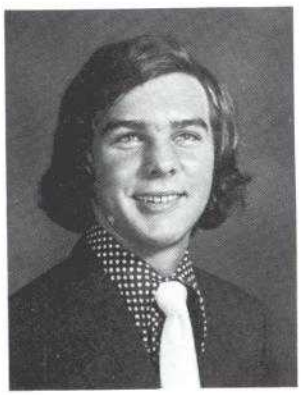
James Scott Galfund, son of Mr. and Mrs. Allan Galfund (Headquarters), B.A. in Communications, American University, Washington, D.C.

Laurie Ann Galfund, daughter of Mr. and Mrs. Allan Galfund (Headquarters), Springbrook High School, Silver Spring, Maryland.

Linda Jean Gifford, daughter of Mr. and Mrs. Leonard Gifford (Etam), Philip-Barbour High School, Philippi, W. Virginia.

Cindy Lynn Ginsberg, daughter of Mr. and Mrs. Marvin Ginsberg (Labs), Milford Mill High School, Baltimore, Maryland.

Jacqueline Denise Gray, daughter of Mr. and Mrs. John E. Gray (Headquarters), Gar-Field High School, Dale City, Virginia.



Douglas E. Gross, son of Mr. and Mrs. Harry G. Gross (COMSAT General), Sherwood High School, Sandy Spring, Maryland.

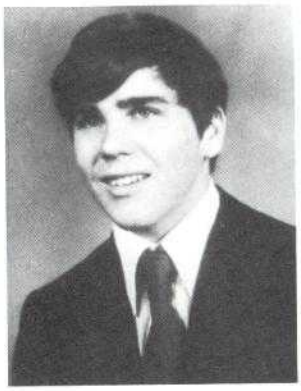
Gregory G. Huson, son of Mr. and Mrs. George R. Huson (Labs), Gaithersburg High School, Gaithersburg, Maryland.

Peter R. Karasik, son of Mr. and Mrs. Daniel D. Karasik (Headquarters), Sidwell Friends School, Washington, D.C.

Stephen P. Keller* (COMSAT General, New York), M.S. in Marine Transportation Management, State University College of New York Maritime College.

Mary Catherine Kilcoyne, daughter of Mr. and Mrs. James H. Kilcoyne, Jr. (COMSAT General), Georgetown Visitation Preparatory School, Washington, D.C.

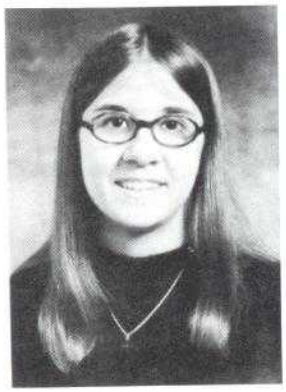
Melissa V. Koskos, daughter of Mr. and Mrs. Paul Koskos (Labs), Thomas S. Wootton High School, Rockville, Maryland.



Robert Meredeth Leard, son of Mr. and Mrs. Robert Leard (Etam), Parsons High School, Parsons, W. Virginia.

Janette Patricia McCusker, daughter of Mr. and Mrs. J. Pat McCusker (Labs), Frederick High School, Frederick, Maryland.

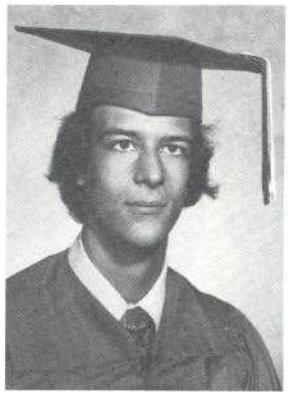
Kenneth Alan Miller, son of Mr. and Mrs. James E. Taylor (Labs), Hedgesville High School, Hedgesville, W. Virginia.



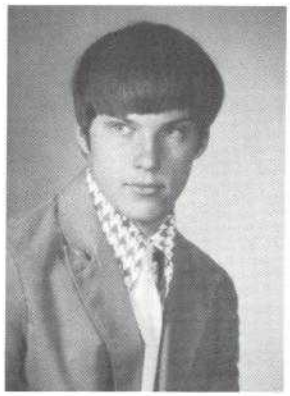
Carol A. Moore, daughter of Mr. and Mrs. Wayne W. Moore (Labs), George C. Marshall High School, Falls Church, Virginia.

*Corporate employee

Sarah Lynn Musgrove (Labs), Damascus High School, Damascus, Maryland*



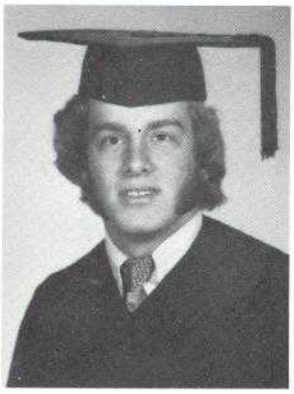
Gregory Dean Ott, son of Mr. and Mrs. Robert R. Ott (Headquarters), Robert E. Peary High School, Rockville, Maryland.



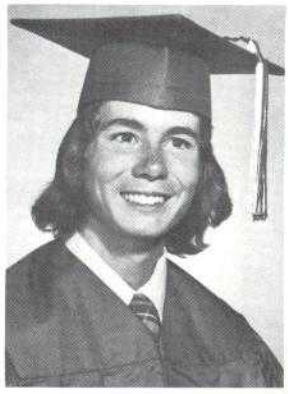
David Eugene Parsons, son of Mr. and Mrs. Roger E. Parsons (Etam), Southern Garrett County High School, Oakland, Maryland.

Dean Allen Parsons, son of Mr. and Mrs. Roger E. Parsons (Etam), Southern Garrett County High School, Oakland, Maryland.

Elizabeth Susan Peterson, daughter of Mr. and Mrs. John J. Peterson (Headquarters), B.S. in Nursing, University of Maryland, Baltimore, Maryland.

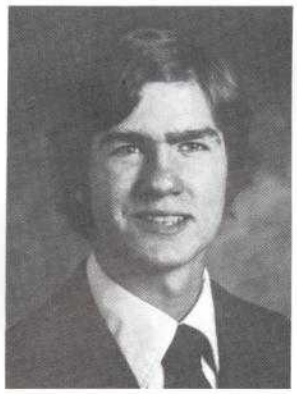


Patrick G. Peterson, son of Mr. and Mrs. John J. Peterson, (Headquarters), Surrattsville High School, Clinton, Maryland.



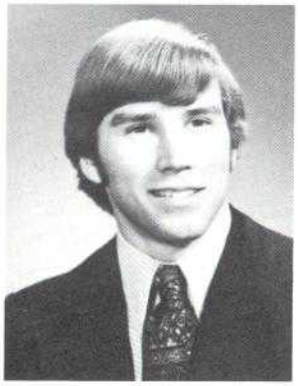
John A. Rutter, son of Mr. and Mrs. Jack L. Rutter (COMSAT General), Robert E. Peary High School, Rockville, Maryland.

Margaret Jo Dorian Skidmore, daughter of Capt. and Mrs. Charles Dorian (Headquarters), Bachelor of Music, Catholic University, Washington, D.C.

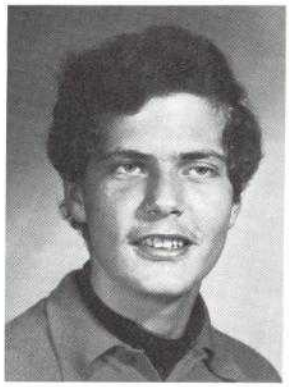


Kerry Lefoe Skinner, son of Mr. and Mrs. George L. Skinner (Headquarters), W.T. Woodson High School, Fairfax, Virginia.

Laurie M. Smith, daughter of Mr. and Mrs. Richard Smith (Labs), Charles W. Woodward High School, Rockville, Maryland.



Nicholas V. Smith, son of Mr. and Mrs. Lewis V. Smith (Headquarters), M.A. in Business Administration, Cornell Business School, Ithaca, New York.



Geoffrey S. Souris, son of Mr. and Mrs. Gus S. Souris, Jr. (Headquarters), Lackey High School, Indian Head, Maryland.

Johan Pieter Suyderhoud, son of Mr. and Mrs. Henri G. Suyderhoud (Labs), Thomas S. Wootton High School, Rockville, Maryland.

Charles A. Timmons, son of Mrs. Marion A. Timmons (Headquarters), Washington-Lee High School, Arlington, Virginia.

Kathleen P. L. Wong, daughter of Mr. and Mrs. Charles K. H. Wong (Paumalu), Aiea High School, Aiea, Hawaii.

*Corporate employee

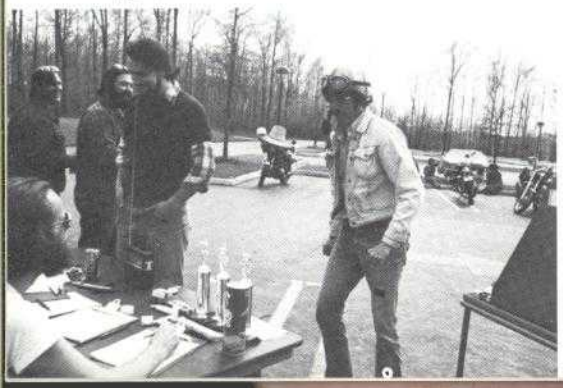
Cyclists receive instructions and helpful hints . . .

Only the best survived

then man their bikes.

Bill Windell gaves directions to Checkpoint 1 to Nita Allgood and backup.

"Whadda-ya-mean?" explodes Don Rivera when told he missed Checkpoint 7.



By Anne Speare

When was the last time you saw a grown man down on all fours playing jacks beside a well-traveled road? Well, it happened during the recent First Comsat Motorcycle Club Rally sponsored by the CEA.

Seventeen unsuspecting employees entered the rally not knowing where they were going or what they would be expected to do. They knew only that they would be traveling over 50 miles of county and improved dirt roads. Seven manned checkpoints were set up at various intervals along the way. Riders were given directions to the next point and a card for a poker hand only after they had performed a simple task (or a reasonable facsimile thereof).

For example, at checkpoint 1 each person was given a coloring book and crayons and asked to color a picture while standing in the middle of a stream. Riders at checkpoint 2 placed a gunny sack over their feet and hopped to a nearby table. They were then asked to reach into two of four containers marked "road tar," "fish hooks," "slop jar," and "broken glass." Much to the chagrin of most of the participants, each container held an ingredient which had been chosen with considerable care to resemble that described on the label.

Checkpoint 3 was the scene of the only accident of the day. While bobbing for apples, one person thoroughly soaked his head and then proceeded to misplace a tooth in one of the apples. (Reliable sources later informed this reporter that his day finally began to look up when he ran into the tooth fairy at the last checkpoint.)

Checkpoint 4 proved to be a really tough one. It seems that some people had never played jacks before and few had played on a gravel road. Each time the ball hit gravel it spun off at an angle which could be predicted only by the most diligent physicists in the group.

Checkpoints 5 and 6 added an element of confusion to the rally. The same roads were used twice, but the directions were varied. Riders were directed to count 20 poles the first time, 45 poles the second time, and then to take the first left. Some people counted specific types of poles and ended up in a nearby town. However, those who were slightly more adept at following directions returned to the same checkpoint they had left minutes earlier.

Checkpoint 7 was a test of optical acuity, in other words, the checkpoint was hidden from view. A sign placed at the top of a hill warned all riders to turn back. As soon as they turned around, they should have been able to see the checkpoint off to the side at the bottom of the hill. Needless to say, several people missed it entirely and were last seen riding off into the dusk (or was that dust?)

Trophies were given to the two riders with the best time and to the rider with the best poker hand. Martin Kelinsky of the Plaza won first prize with a record-breaking time of two hours, 56 minutes and 27 seconds. Norman Miller of the Labs was second with a time of three hours, 55 seconds. Paul Coelho of the Labs had the best poker hand, two pair.

Mrs. Speare is in the Signal Processing Department at the Labs.

Play jacks? I'm a bike jockey!

Hmmmmmm, which one?

I know it's in here.

I got it! I got it!

Boat or bike?

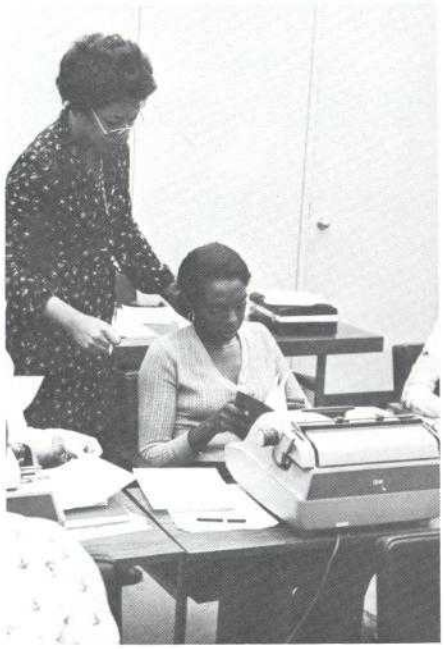
Anne Speare checks final mileage.

The results are posted.

Bill Windell presents trophies to winners, left to right, Norman Miller and Vanessa Pennington, Martin and Rose Kelinsky, and Paul Coelho and Vicki Harner.

First of Clerical Development courses completed

Ms. Marva Stevens of Procurement receives a Certificate of Achievement from Personnel's William Lockett as Brenda Lister, Training Administrator, looks on. Ms. Stevens was one of 11 COMSAT employees recently graduated from the shorthand course offered by the Office of EEO and Human Resources Development.



Instructor Laura Dawson, former COMSAT employee and a Program coordinator, provides assistance to Ms. Yvonne Stokes of Personnel Services. The Clerical Development Program includes clerical skills training and clerical job enrichment programs.

Ms. Becky Deedrick of ISD performs transcription drill during the 10-week Beginning Shorthand Course. Students are presented certificates following successful completion of the course and passing the COMSAT shorthand proficiency test.

COMSAT Labs hosts IEEE Meeting

COMSAT Labs recently served as host for a seminar on Multiple User Communications sponsored by the Information Theory Group of the Institute of Electrical and Electronics Engineers (IEEE). W. W. Wu of the Labs, present Chairman of the Washington Chapter of the Group, was primarily responsible for the organization of this seminar attended by more than 100 professionals representing various government and commercial organizations.

Following opening remarks by B. I. Edelson, Director of the Labs, eight papers were presented. J. Aein (Institute for Defense Analysis) began the seminar with a perspective survey of satellite communication developments, interrelating technology, systems, and theory. A. D. Wyner (Bell Telephone Labs) discussed the broadcast channel, giving the limits of its capacity. N. Abramson (University of Hawaii) presented a description of the ALOHA system as a practical example of Packet Broadcasting Computer Networks.

R. Gallager (MIT) discussed his most recent results on protocol in multiple user networks, considering some basic limitations on the amount of protocol information that must be transmitted in a data communications network to maintain a record of source and receiver addresses and the beginning and end of the messages. J. Savage (Brown University) presented performance results based on his error probability derivations for signal detection in the presence of multiple access noise.

D. Anderson (TRW) spoke on the theoretical modeling and computation of code-division multiple access system through a hard limiter. W. G. Schmidt (Computer Sciences Corporation) discussed the design philosophy of satellite-switched systems, and W. Wu (COMSAT) presented two coding algorithms for application to random multiple-access satellite systems. The seminar was concluded with remarks by P. Bargellini (COMSAT), who summarized the papers presented and also gave highlights of the INTELSAT Sys-

tem. A conducted tour of the Labs was also given.

The Information Theory Group is an organization within the framework of the IEEE. The professional interests of its members span the gamut of Information Theory, and include Shannon Theory, modern communications, coding theory, detection and estimation, pattern recognition, learning, hypothesis testing, and the applications of stochastic processes. The projects and publications of the Information Theory Group meet the highest standards of the IEEE.

Labs staffers present lecture series at Howard University

At the request of the Electrical Engineering Department of Howard University, representatives of the COMSAT Labs recently presented a series of lectures in the form of seminars to undergraduate and graduate students and faculty members.

Joachim Kaiser, Manager, Small Terminals Development Project, Transmission Systems Laboratory, spoke on the topics, *Introduction to Satellite Communications, Large versus Small Earth Stations,* and *Important Paramaters and Future Experiments.* Dr. Pier L. Bargellini, Laboratories Senior Scientist, lectured on *Modulation and Multiple Access Systems, Spectrum and Orbit Utilization.* R. W. Kreutel, Manager of the Antennas Department in the Microwave Laboratory, discussed *Antenna Technologies for Spacecraft and Earth Stations.*

According to Dr. Bargellini it is anticipated the program will be repeated and expanded next year to include a greater number of lecturers and to cover a broader spectrum of items.

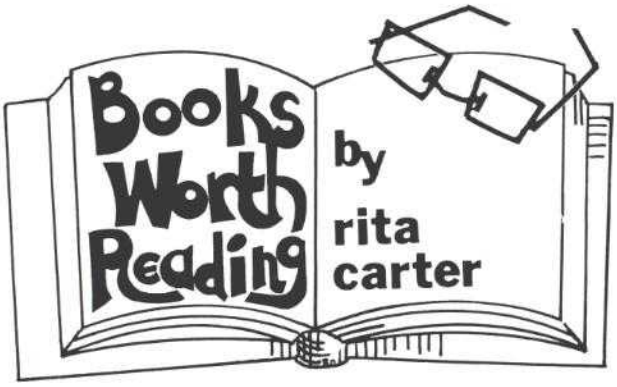
Meet our new librarian

Rita Carter is a graduate of the College of St. Teresa in Winona, Minnesota. She and her husband are both originally from Minnesota and have lived in the Washington area for two years. Rita has previously been employed as a librarian at the Mayo Clinic in Rochester, Minn., where she specialized in bibliotherapy. More recently, she was a document librarian in research and development for the firm of Ketron, Inc., in Arlington, Virginia. Rita and her husband, a Department of Defense Employee, reside in Alexandria.

Patent incentive awards presented

James B. Potts, Director, Earth Station Engineering Division, second from left, presents patent incentive awards to three members of his division. Receiving awards were, left to right: L. V. Smith, "Steerable Feed for Toroidal Antennas;" Potts; E. Wilkinson, "Satellite Antenna Autotrack System Permitting Error Signals to Appear at the Earth Station;" and J. Beyer, "Compensated Zoned Dielectric Lens Antenna."

PHOTO BY ALLAN GALFUND



New Books

REFERENCE

Broadcasting Yearbook 1975

CATV Television Factbook 1974-1975, Stations and Services Volumes

1975 Electronics Buyers Guide

Dun & Bradstreet Million Dollar Directory and *Middle Market Directory 1975*

National Trade & Professional Associations of the United States & Canada & Labor Unions (NTPA) 1975

1974 National Zip Code Directory

1974-1975 Directory of Science, Technology, and Manufacturing for Metropolitan Washington

Scientific, Technical, and Engineering Societies Publications in Print 1974-1975

1975 U.S. Fact Book, American Almanac, and Statistical Abstract of the U.S.

Proceedings

IEEE Canadian Communications and Power Conference 7-8 November 1974

Proceedings of the Seventh Hawaii International Conference on System Sciences, 1974, with Computer Nets Supplement, IEEE

Proceedings of the IEEE, 1965-1973 on microfilm

Books

American Institute of Certified Public Accountants. *Selected Studies in Modern Accounting, 1974*

Bach, George. *Economics, An Introduction to Analysis and Policy,* 8th ed.

Bishop, Jerry. *"I think I'm Having a Heart Attack."*

Brigham, E. Oran. *The Fast Fourier Transform*

Caplan, Edwin. *Management Accounting and Behavioral Science*

Davis, Keith. *Human Behavior at Work: Human Relations & Organizational Behavior*

Ficchi, Rocco F., ed. *Practical Design for Electromagnetic Compatibility*

General Radio Co. *Handbook of Noise Measurement,* 7th ed.

Johnson, Robert W. *Financial Management,* 4th ed.

Kahn, Alfred. *The Economics of Regulation: Principles and Institutions,* Vol. I & II

Klapper, Jacob, ed. *Selected Papers on Frequency Modulation*

Raby, William L. *The Income Tax and Business Decisions,* 3rd ed.

Rappaport, Louis H. *SEC Accounting Practice and Procedure*

Wernette, John Philip. *Government and Business*

The Income Tax and Business Decisions 3rd edition, WILLIAM L. RABY.

This book is an overview of the federal income tax provisions that have impact on business and investment decisions. Part I investigates various concepts of income. Chapters include the following subject areas: tax experts, (the taxpayer and the Government), as well as tax, income and accounting concepts. Part II develops income tax history in both large and small business corporations, partnerships, individual income, and fiduciary income tax. A closer look at income tax details is observed in Part III. Examples of areas explored are capital gains, income timing, minimum and maximum tax, depreciation, investment credit, depletion and the cost of oration and development, inventory, taxation of employee organizations, investors, estate taxes, and foreign tax matters. Tax practices and consequences are viewed in Part IV, giving the reader an understanding of the United States system of tax determination and collection.

The Income Tax and Business Decisions generally presents the broad rules of income taxation. The reader can become familiar with tax procedures and develop an understanding of the complexities involved in the income tax pattern. Intended as a text together with the Prentice-Hall *Federal Tax Handbook,* this new edition is updated with current procedures featuring specific concentrations for the business manager. Major understanding of tax planning is described through a logical progression from simple corporate financial statements into the tax aspects of those same financial statements later in the text. Court case excerpts emphasizing the reality of tax administration appear at the end of each chapter. Supplementing the text also are questions and answers broadening the reader's outlook with research in specialized areas of interest.

In summary, *The Income Tax and Business Decisions* is an introductory book on federal taxes aimed primarily for accountants and business managers. It serves as a guide for tax practice and helps managers make practical decisions and plan effective tax programs.

Labs Closeup

Betty Mowen, R.N.

By Shirley Taylor

One of the busiest people at the Labs, and one of the best known, is Betty H. Mowen, or "Nurse Betty" as she is often called. Off-duty, Betty is married to Robert Mowen, an educator, and the couple lives in Boyds, Maryland. She is the mother of one married son, Bill, now 23.

Betty came to Comsat Laboratories from a long career in nursing, beginning 25 years ago with graduation from the Jefferson School of Nursing in Roanoke, Virginia. She became a Registered Nurse after passing the State examination. At first she nursed in hospitals, then in Doctors' Offices; later she was a Public Health Nurse for 9 years. In 1964-65 she created and operated a School for Practical Nurses in Martinsville, Va. She began industrial nursing in 1966 and opened the Labs Medical Facility in September 1969.

Betty does a lot of things besides apply Bandaids and dispense aspirin to ailing Labs personnel. In the course of daily routine, she does a surprising amount of one-to-one counseling as part of her job, encompassing physical and mental health. In addition, she has developed and presented a number of educational programs, begun in 1970, with strong emphasis on preventive medicine. Most well known among these are the cancer and heart disease awareness programs.

Dr. Healy and Nurse Mowen review medical charts. PHOTOS BY BILL MEGNA

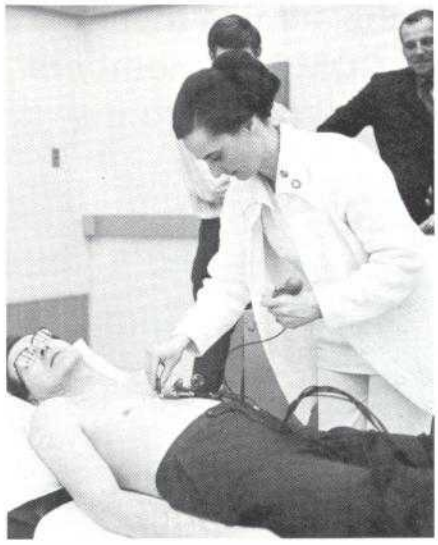
In connection with the cancer program, an Army Nurse from Walter Reed Hospital came and gave demonstrations to women on self inspection for breast cancer. Another volunteer from the American Cancer Society spoke at an open meeting on the need for early detection. This gentleman had had his larynx removed three years previously and spoke by means of sudden expulsions of air. He was a most effective witness to the ravages of cancer. Earlier, a Stop Smoking Clinic was conducted after working hours with the aid of the Washington Adventist Hospital. Twenty-three smokers participated in this program in 1972 and seven are still non-smokers as a result. Betty would like to start another such clinic but needs 50 people to do so.

With the Heart Disease program, a cardiologist spoke to employees and their spouses, and later a nutrition expert from the Heart Association gave advice on meals and food preparation. The Labs Cafeteria cooperated with this effort and prepared special lunches marked with a red flag.

Another outgrowth of such special programs was an exercise-diet workshop which has been especially popular with women employees. Betty initiated the workshop with the help of the Montgomery County Recreation Department, and it has continued on a volunteer basis at lunchtime. No record is available as to the number of pounds and inches lost, but enthusiasts of the program testify that it is sizable!

Everyone knows about the blood bank, which is a yearly function in conjunction with the American Red Cross. There have never been less that 73 pints donated per year, and 23 employees have donated every year since its inception in 1970. About 80 percent of the donors at the Labs are "repeaters".

Mrs. Taylor is in the Senior Scientist's Office at the Labs



Nurse Mowen connects equipment to Labs employee J. Kaiser to take Electrocardiogram.

Betty has made numerous safeguard-type services available such as flu shots, glaucoma tests, and regular chest X-rays. This spring she arranged a special test of the level of cholesterol in the blood in cooperation with a program at NIH. Just completed is the newest and probably the most far-reaching test—electrocardiograms, all taken by Betty, for all employees who expressed a desire to have such test made beginning with those over 40 years of age.

These tests resulted in consultation where necessary with Dr. Michael Healy, who acts as the Director of the Medical Facility. Betty and Dr. Healy work closely together in all her "special programs."

A regular part of Betty's activities, as covered previously in Comsat News, is her training and implementation of a First Aid Crew. They stand ready at any time to assist her in dealing with emergencies or to cover for her when she leaves the Labs.

Future possibilities are a mental health clinic, a men's physical fitness program, and perhaps series on drug abuse and alcholism. Whatever plans come into fruition, you can believe that "Nurse Betty" will be busy brewing some new ideas for maintaining the health and vigor of her co-workers and friends. Labs employees are most fortunate that she is so imaginative and dedicated, and are grateful they have her to look out for their welfare.

Scholarships awarded sons of COMSAT members

Present at the National Merit Scholarship Awards ceremony were (left to right) Lt. Col. and Mrs. Douglas Binney, award winner Bruce Binney, Dr. Charyk, honorary award winning Chris Charyk, award winner Peter Karasik and Daniel D. Karasik.

National Merit Scholarship Awards were presented recently to the sons of COMSAT President Joseph V. Charyk and Daniel D. Karasik, Manager, Customer Relations, Service Development.

Christopher E. Charyk, the original COMSAT Merit Scholarship winner, declined the scholarship and was named "Honorary Merit Scholar" as authorized by the National Merit Scholarship Program. Runner-up Peter Karasik was then awarded a special scholarship.

Bruce C. Binney of Alexandria, Virginia, although not the son of a COMSAT employee, was also the recipient of a four-year scholarship in accordance with the Agreement of the National Merit Scholarship Corporation. Under this agreement NMSC is empowered to award the $1,000 scholarship on an unrestricted, one-time basis to a non-employee child finalist in the annual Merit Scholarship Program.

Chris Charyk, a graduate of Landon School in Bethesda, Md., plans to enter Pre-Law at Brown University. Peter Karasik, a graduate of Sidwell Friends School in Washington, D.C., will enter Yale University to study Physics or Chemistry. Bruce Binney, a graduate of Fort Hunt School in Alexandria, plans to study Electrical Engineering at Rensselaer Polytechnic Institute, Troy, N.Y.

Young Binney was the subject of a recent feature article in the Washington Post. The story, which described at some length the curricular and extra-curricular activities of Bruce in the physical sciences, noted that he had competed against 14,000 finalists across the country in winning one of the coveted scholarships. He is the son of Lt. Col. Douglas and Margaret Binney of Alexandria.

Pollack gets Sigma Xi full membership

Louis Pollack, Assistant Director—Technical, COMSAT Laboratories, has been initiated into full membership in the Society of the Sigma Xi.

Sigma Xi, an honorary society for men and women in the natural sciences, has 200,000 Associate and Full members. Full membership is achieved through outstanding achievement in research. The society emphasizes encouragement of excellence in research through award of research grants, publication of American Scientist magazine, its lecture program, and national meetings.

Mr. Pollack joined COMSAT in 1967 after 23 years at ITT Federal Laboratories. He received his B.E.E. degree from the College of the City of New York, and is a Fellow of the IEEE, an associate member of the National Society of Professional Engineers, and a member of the AIAA.

Fighting the high cost of living

PHOTO BY ALLAN GALFUND

Members of COMSAT's Transportation and Mail Room decide to strike a blow at the high cost of living and share a single sandwich for lunch. Prepared for the first bite are, left to right, John Newman, Ronnie Davis, Gregory Jefferson and Vincent Jordan. Waiting their turn at the "Hoagie" are, left to right, John Lawrence, James Randolph, Henry Palmer, Gary Hunt, Robert Brighthaupt and Jack Curtis.

COMSAT's Satellites begin with a win

The CEA sponsored Women's Softball Team, the COMSAT Satellites, which got off to a soaring start with an 18-7 victory over GSA in May, plays regularly every Thursday evening on the fields adjacent to the Lincoln Memorial at 23rd and Constitution Avenue.

Coaching the team this year is Harriett Biddle of COMSAT's EDP Information Systems Department assisted by Wayne Brown of Office Services, backed up by Ralph Lorenzo and Bill McGraph who volunteered their services from GSI, a Washington D.C. firm employing three of our star players, Claudia Toy, Karen Heygi and Laurel Bryan. Marion Timmons of Legal is the team Manager.

This is the fifth consecutive year of play for the women's softball enthusiasts. Charter players are Ruth Adams and Kitty Harbin of COMSAT. Pitching for the team and also acting as Team Captain is COMSAT's Computer-oriented Mabel Vandergriff. Other COMSAT veterans are Evelyn Smith, Linda Kortbawi and Gail Ricci. New to the team this year are COMSAT's Hillis LaRose, Brenda Williams, Coletta Firlow, Beatrice Wilborn and Katherine Pyles. Players from Gallaudet Model Secondary School for the Deaf are Carolyn Jones and Dianne Adams.

COMSAT employees are urged to turn out in support of the Satellites.

Network Bits

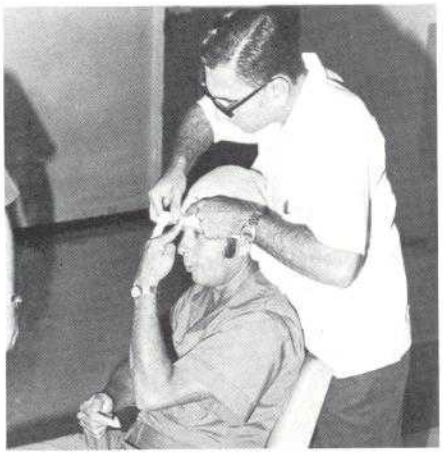
CAYEY. The Civil Air Patrol, which bears an enviable lifesaving record, recently found its Puerto Rico Wing on the receiving end of being rescued with COMSAT doing the rescuing.

The Wing, which provides the Coast Guard with resources in search and rescue operations inland as well as over water to the U.S. Virgin Islands and some of the British Islands, likes to boast its personnel are the best but had to admit recently that even the best can run into a bind, and they did.

Three Cessna 172's, employed in inland and coastal searches, and a twin-engine Cessna 310 provided by the Air Force constitute the Patrol's air power, the latter being used for "long haul" searches. The problem with the Cessna 310 was that it was a 1954 model and its communication and navigation radios were obsolete, even obtaining a replacement tube was a chore.

COMSAT's **John J. Gonzalez,** a Captain in the C.A.P. and Wing Senior Member Training Officer, together with the other members of the Wing, assessed the cost for replacement equipment. A local airline would obtain the equipment at "cost price" which would cut the cost almost in half and would perform removal and installation free of charge. With everyone chipping in, the Wing was still $500 short. A letter to the COMSAT Contributions Committee resulted in the additional money becoming available. Equipment installation is scheduled to begin soon and the Puerto Rico Wing of the Civil Air

COMSAT's John J. Gonzalez with the Puerto Rico Wing's Cessna 310 to receive new communication and radio equipment as the result of a COMSAT grant. The Cessna is one of the Wing's four aircraft used to assist the Coast Guard in search and rescue operations.



During Red Cross conducted First Aid training at Cayey Luis Medina applies a head bandage to Paul McGranaham.

Cayey Station Manager L. R. Rodriguez presents COMSAT's check for $500 to Civil Air Patrol Wing Commander Col. R. Criscuolo as John J. Gonzalez looks on.

"Injured" Juan Sierra is placed on a stretcher by, left to right, Frank Falmar, Luis Medina and Paul McGranaham as Red Cross Instructor Ernesto Cortes observes.

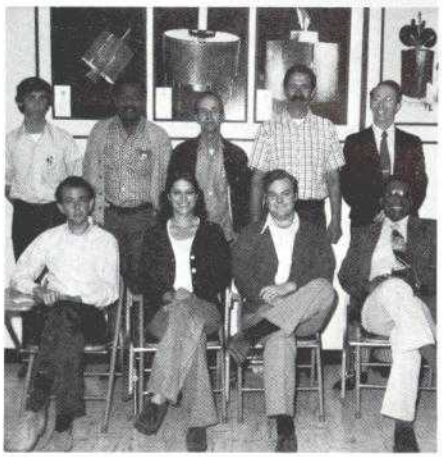
It's Paul again, this time getting special attention from Instructor Cortes.

Patrol extends its appreciation to COMSAT for coming to its rescue.

Incidentally, **Capt. Gonzalez** (your correspondent) has completed ECI-CAP Officer Course and Squadron Officer School, has 1,700 hours flying time and holds FAA flight instructor status with commercial, multi-engine and instruments ratings.

Cayey Station personnel recently went through a Red Cross First Aid Training Course conducted on station by Ernesto Cortes, sub-director of the Civil Defense Department from Aibonito. **—John J. Gonzalez**

JAMESBURG. A Microwave Measurements Seminar conducted by Cliff Jones of Hewlett Packard was completed recently with **Earl Jones, Larry Cisneros, Stan Nubin, Mark Seaman, Gay Powers, Marco Treganza, Loren Asmus, Ralph Blank, Tom Allen** and **George Hannah** attending. The seminar was similar to the earlier one conducted last year.



Microwave Measurement Seminar attendees with instructor Cliff Jones seated at right.

George Furford received his five-year pin from Station Manager **John P. Scroggs.** JCEA picnic plans are in the mill. Arrangements have been made for the use of the California Water Company Filter Plant area which is conveniently located not too far from the station.

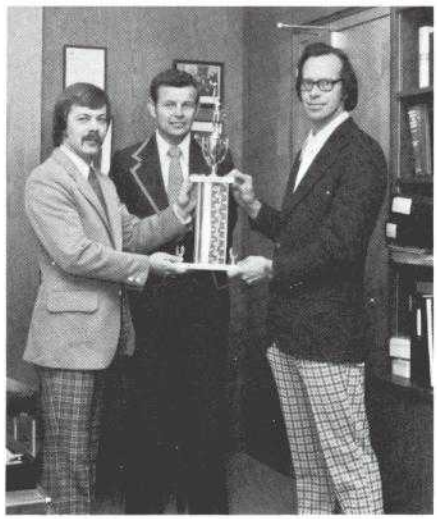
With good weather, horseshoe pitchers surround the pits at lunch time and the challengers are many. **Jim Vinneau** displays considerable improvement (on occasions), but it's **Larry Cisneros** whose pitching determines whether or not it's tournment time. **—W.E. Neu**

LABS. Had difficulty making the deadline this issue, having been somewhat preoccupied since May 31—on that day I changed my name to **Mrs. William C. Van Der Weele**. During May my son and I took a "last fling" and went off to Lake Buena Vista, home of Disney World. After a week of camping in the Disney World Wilderness Camp grounds it was nice to get back home and relax (?).

Labs and Plaza friends of the former **Marie Curtis** extend their congratulations to Marie who became **Mrs. John B. Allnutt** on May 2. To those of us who thought Marie was in California on vacation, it was quite a surprise to come into the Labs and find our friendly cashier, **Betty Linthicum,** happily tacking up congratulations all over the building.

The COMSAT Labs Mixed League Bowling Banquet was held the end of May at the Hyattstown Fire Hall. The food was fantastic with music provided by the Saints and Sinners. Team trophies were awarded for first, second and third place. The first place trophy went to the team captained by **Hank Mueller** and members **Marie Allnut,** your columnist, **Bert Collins** and **Dick Musser**. High average trophies were presented to **Bud Kennedy** and **Patty Woodruff.**

During the last weekend of May, the Labs Slo-Pitch Softball Team hosted the second annual slo-pitch tournament. It was evident that, after many months of work, the 270 Corridor had produced eight very polished teams including our own. After two fast-paced days of ball, the tournament had narrowed the field to two teams—Lawson Motors and Vitro. Although the Lawson "Nine" came out on top, Vitro's Peter Roth was named Tournament Most Valuable Player.



Left to right, Van Der Weele, Reisenweber and Carlton.

William C. Van Der Weele of Gaithersburg's Department of Parks and Recreation recently presented Labs Director **B. I. Edelson** the Monday Night B League Basketball trophy. It was the second year in a row the Labs team won the league and further sweetened the victory by winning the 1975 championship playoff by defeating the teams of Bechtel, Bish Thompsons, FDA, AEC and Comress. Coach-Managers for the Labs "Five" were **Peter Carlton** and **John Reisenweber. George Meadows** was high scorer for the year.

—Carol Van Der Weele

PLAZA. Wayne Brown has been designated Facilities Coordinator reporting to **Gene Christensen,** Manager of Facilities and Office Services. **Wayne,** a graduate of Brown University and a former employee of Western Electric, will be responsible for COMSAT telephone coordination and related matters.

The CEA has reserved a volleyball court for each Tuesday between 6:00 and 8:30 p.m., located near the Lincoln Memorial. Arrangements for their use may be made by contacting **Ed Mikus** at 6860, **Mike Jeffries** at 6858 or **John McManus** at 6536.

Lou Early is in receipt of a "Thank you" letter from Mrs. Betty Casper, Director of Social Services at the National Lutheran Home for the Aged, in appreciation for stamps contributed by COMSAT employees. According to Mrs. Casper, "These stamps mean much to the residents. Working with them, preparing them for sale, and their ultimate sale help our residents of limited ability feel like useful citizens. Keep them coming."

To **Ted Gottry** from his many friends within the corporation, our best wishes on his retirement to Florida June 30. Since joining COMSAT in 1967, Ted has been actively involved in COMSAT Credit Union affairs. From the many home-boat-car buyers, borrowers and investors, who

have had occasion to call on Ted's financial expertise through the years, our wishes for many years of lazy "basking" in the Florida sunshine for him and his wife.

As proof that age is strictly a state of mind, **Gus Rauschenbach,** Congressional and Government Relations, recently dropped off a news clipping from the Bergen Evening Record in New Jersey containing a feature entitled, "Elderly step out in style." The story dealt with a fashion show at which the residents of the Allendale Nursing Home modeled spring fashions for the other residents. Among the models was the mother of Gus, **Josephine Rauschenbach,** age 95.

Twenty-five years ago Mr. and Mrs. **Henry Whitehead** were married by the Pastor and Founder of the Bible Way Church in Northwest Washington, Bishop Smallwood E. Williams. To celebrate their Silver Anniversary, their son and daughter gave them a surprise party at Blackie's House of Beef with more than 20 guests present. A cake, gifts and the singing of "Happy Anniversary" were included in the festivities.

Henry and Tessie Whitehead

"**Tessie**," as she is affectionately known throughout COMSAT, when asked to what she attributed the success of their 25-year marriage replied, "A good Christian life, love, understanding, and, above all, togetherness."

Ed. Note. *The Comsat News has need for a PLAZA reporter. Anyone interested in writing a column of PLAZA activities for inclusion in Network Bits should contact the Editor, John Peterson, at 6104 or 6105.* **—JJP**

SINGAPORE. The Asia Office had two visitors from COMSAT GENERAL in April. **John Keyes** was in Singapore to conclude an agreement with a local agent for installation and maintenance of MARISAT terminals. Following this visit he went on to Hong Kong and Japan on similar missions. **Miles Merians,** who accompanied Keyes to Japan, returned to the Asia Office with **R. J. Matthews** from COMSAT GENERAL in Washington. **Matthews'** visit was for the purpose of finalizing arrangements for installation in Singapore of the first MARISAT antenna to be put on a ship outside of the U.S.A. the *Esso Wilhelmshaven,* a 285,000-ton, Very Large Crude Carrier (VLCC).

When the installation was finished, in mid-May, Mr. **Merians** climbed the six-story-high steel mast to get pictures of the antenna. His only comment, "it was an experience". Even from that height, he said, "The ship seemed to stretch interminably before finally quitting at the bow." As he said, "285,000 tons is a lot of steel (and oil) to push around the oceans."

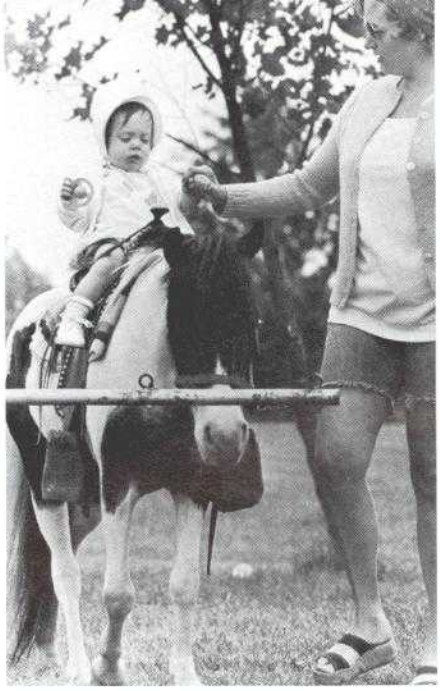
May is also the time when the sun beats down most intensely on Singapore, which lies almost on the Equator. Despite being a tropical island, Singapore unfortunately has no really beautiful white and deserted beaches such as one might expect. But there are plenty of these in Malaysia and **Pat Chen,** the AO Secretary, best describes a vacation there. **Pat** went to a quiet sunny island, Pulau Tioman, off the coast of Malaysia. Although there is a first class hotel, the island is completely cut off from the outside world—no telephone, no newspaper, no TV, no radio. It takes a two-hour boat ride to reach it from the mainland, but the cool sparkling waters and beach of fine white sand backed by willowy coconut palms, make it worthwhile. **Pat** returned so enchanted with the spot that she vows to go there again at the first opportunity.

Miles Merians, Assistant Director of the Asia Office, climbs the mast of the *Esso Wilhelmshaven* to photograph the first MARISAT "above-decks" antenna.

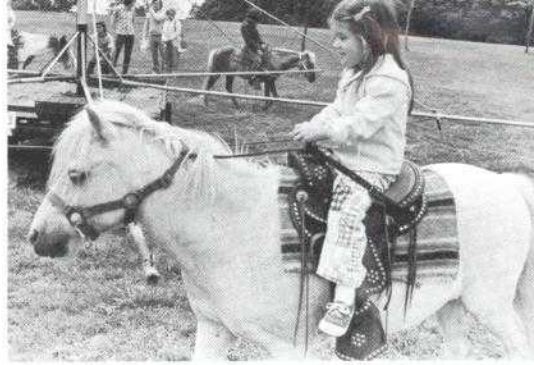
A portion of the MARISAT antenna, left, overlooks the length of the supertanker at its berth in Singapore.

Roman Ulans returned in late April from a trip to West Asia during which he met **Mats C. Nilson** and **Helmo Raag** of the European Office and visited Iran, Lebanon, Kuwait and Oman. Once the backlog of action items which had accumulated during his absence was cleared, **Roman** also opted for a few days vacation, choosing to go to Rawa Island. To get there, you take a ferry from Mersing, on the east coast of Malaysia and about a two hour drive from Singapore. The accommodation at Rawa is, perhaps, best characterized as "rustic," with modern conveniences consisting of a mosquito bar around the bed! The atmosphere, however, was so quiet that the **Ulans, Roman** and **Morwenna,** found it a real chance "to get away from it all." **—Lucy Kwok**

The food gets better every year

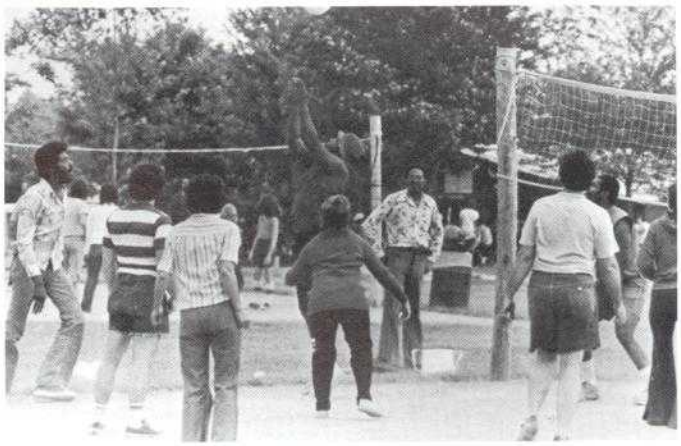


"Hope Mom doesn't let go. . ."



Giddi-up!

Some conserved energy and pitched horseshoes

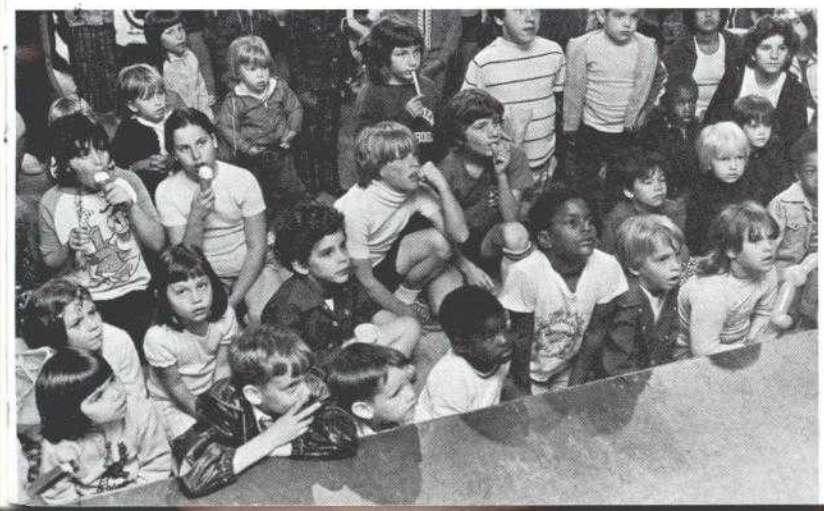


others played a fast game of volleyball

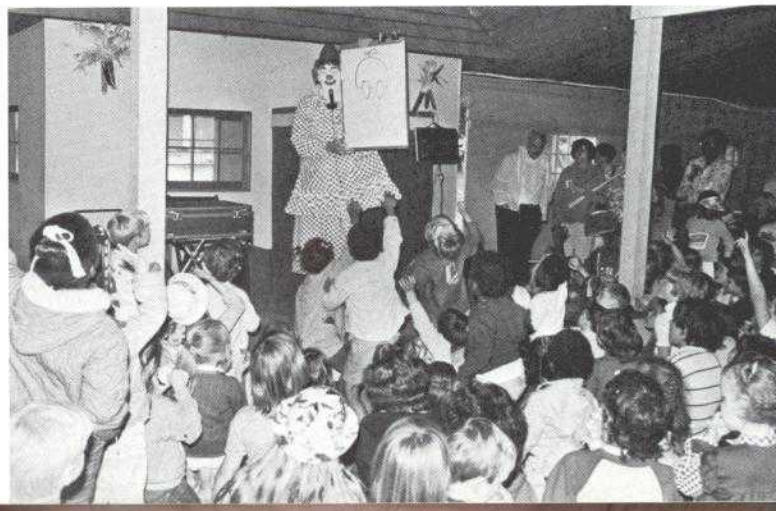
There's *just* enough room left

The CEA sponsored annual picnic for Corporate employees and their families was held in June at Smokey Glen Farm near Gaithersburg.

Who asked "is it worth all the work?"



No shortage of volunteers



Look what Early Bird started! Ten years ago, COMSAT began satellite service to Europe through that pioneering little satellite. Today, a vast COMSAT-managed system of large satellites serves the whole world.

When you place an overseas telephone call, chances are that COMSAT provides you service—via satellite. It now costs much less to call overseas than it did before Early Bird.

When you watch live overseas television, we provide you service—via satellite. Before Early Bird, there was no live overseas TV. And the only way you can see it now is via satellite.

If your business sends messages and data overseas, we probably are serving you too—via satellite.

Via satellite, we've put you in touch. But we're not resting on that. We're expanding our services, and we're adding new ones as well:

COMSTAR I satellites for American Telephone and Telegraph Co.

MARISAT service for the U.S. Navy and the maritime and offshore industries—via satellite.

We're working on other programs, too, in domestic and international communications including aeronautical communications—all via satellite.

What we're doing today is worlds apart from what we were doing ten years ago. For more information, give us a call (202/554-6000) or write us.

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