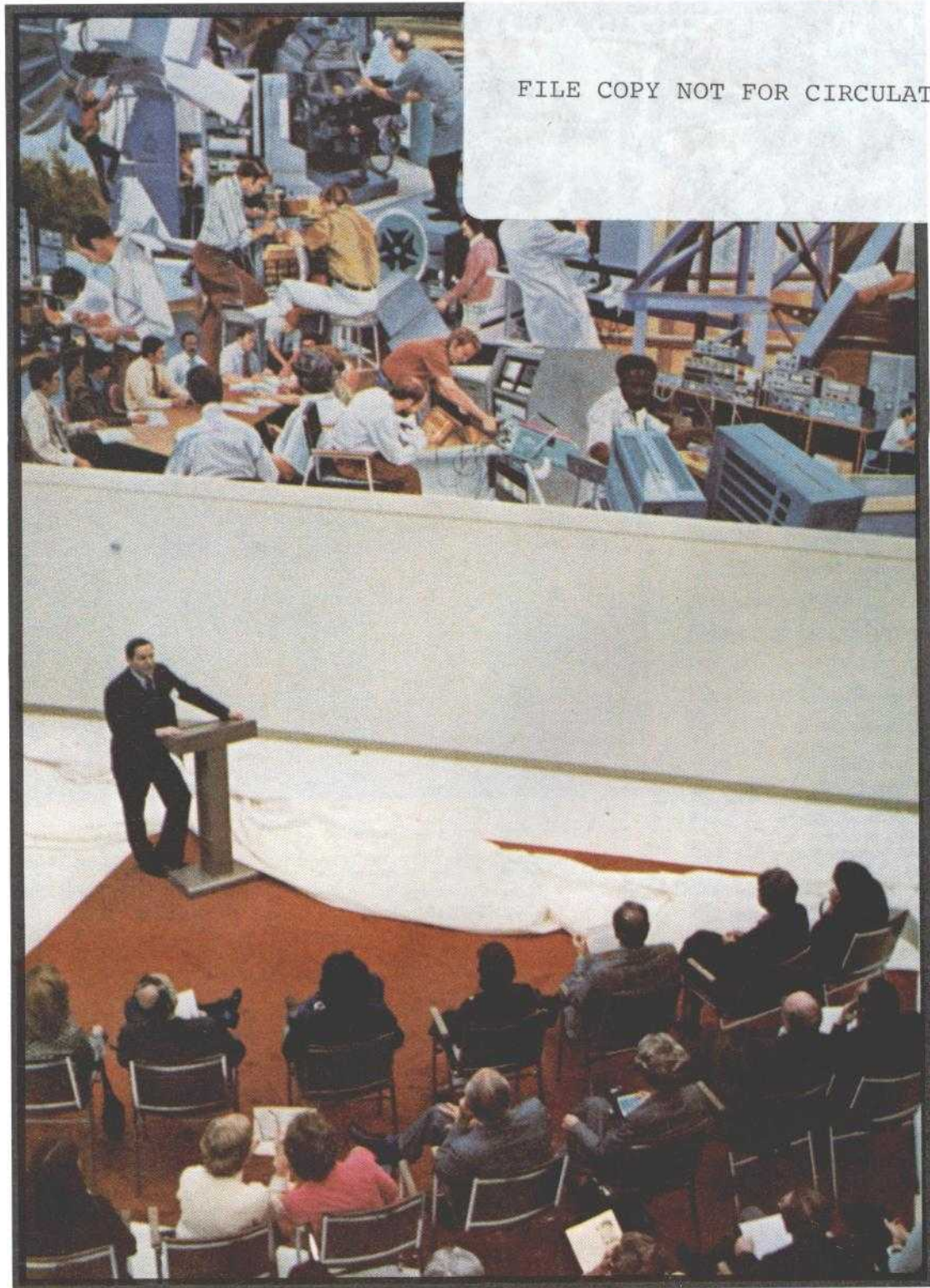


January-February 1978  
Volume 3 Number 1

# Pathways

SATELLITE

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# *Pathways* SATELLITE

January-February 1978  
Volume 3 Number 1

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CORPORATION 1978

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**Cover.** A new mural painted by Artist Terry Rodgers is unveiled during dedication ceremonies at COMSAT Labs. (Story on page 16.)

PHOTO BY BILL MEGNA

# Comsat at 15

The Communications Satellite Act was passed by Congress and signed into law by President John F. Kennedy in August 1962. The

February 1, 1963, to carry out this unique legislative mandate. The Corporation was capitalized at approximately \$200 million through

communications satellite system, and it acted as manager of the fledgling organization.

COMSAT introduced a new era in international communications when Early Bird, the world's first commercial communications satellite, was positioned over the Atlantic Ocean in April 1965 to link earth stations in North America and Europe. Coverage was extended to more than two-thirds of the world in January 1967 when satellites in the INTEL-SAT II series were positioned over both the Atlantic and Pacific Oceans.

The global satellite system envisioned by the Congress in the Communications Satellite Act became a reality in July 1969 when a satellite in the INTEL-SAT III series began to provide service in the Indian Ocean region as well. In that same month the newly created global system enabled one out of every seven people on earth to view man's landing on the moon "Live Via Satellite."

COMSAT Laboratories moved into their present facilities in Clarksburg, Maryland, in September 1969. The Labs were formed about two years earlier to continue the advancement of satellite communications technology.



*The Communications Satellite Act of 1962 became law when President John F. Kennedy signed it in a White House ceremony attended by sponsors and supporters of the legislation.*

new legislation called for the creation of a private corporation to establish, in cooperation with entities of other countries, a commercial communications satellite system on a global scale.

COMSAT was incorporated on

the sale of 10 million shares of common stock in 1964.

COMSAT was designated as the U.S. representative in INTEL-SAT, the international joint venture formed in August 1964 to establish a single global communi-

# 1963 to 1978

The INTELSAT IV satellites were introduced into the global system between 1971 and 1975, and the even more advanced IN-TELSAT IV-A satellites began to provide service in the Atlantic Ocean region in 1976. To work with the IV-A satellites, second antennas were placed in operation in November 1975 at the Etam, West Virginia, earth station, and in December at the Andover, Maine, earth station, two of the seven U.S. earth stations in the global system. The satellites in the INTELSAT IV-A series are scheduled to be succeeded beginning in 1979 by the higher capacity INTELSAT V satellites.

COMSAT GENERAL Corporation was incorporated in 1973 as a wholly owned subsidiary.

In June 1976, the first of COMSAT GENERAL'S COMSTAR satellites, whose capacity had been leased to AT&T for domestic communications, was used to provide long-distance message telephone service for the first time in the U.S.

In January 1977, satellites of the MARISAT System initiated three-ocean service to the U.S. Navy, thereby providing maritime satellite service for the first time on a global basis. The MARISAT System is owned 86.29 percent by

COMSAT GENERAL.

In February 1977, the FCC authorized Satellite Business Systems (SBS), in which COMSAT GENERAL is a partner, to proceed with construction of facilities to provide their proposed all-digital


able to all countries of the world. Today satellites are used throughout the globe for international, domestic and maritime communications. The global satellite system now has 558 satellite pathways providing direct lines

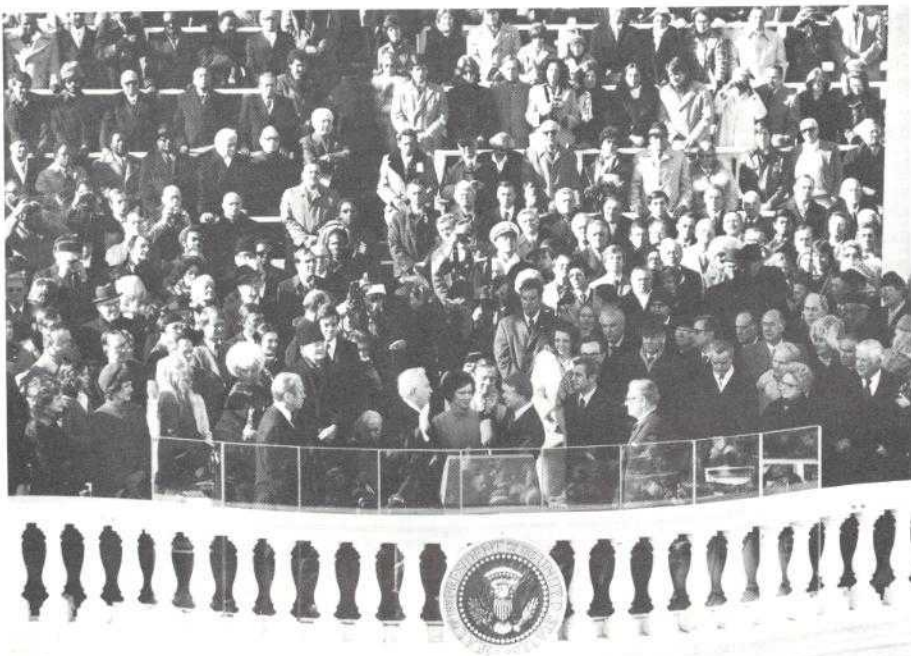


*COMSAT President Joseph V. Charyk, left, and Secretary of State William P. Rogers sign the agreements for definitive arrangements for INTELSAT on behalf of the United States.*

domestic satellite services subject to various terms and conditions. The SBS system is scheduled to begin operations in January 1981.

Fifteen years ago COMSAT was given the mission of making satellite communications avail-

able to all countries of the world. Today satellites are used throughout the globe for international, domestic and maritime communications. The global satellite system now has 558 satellite pathways providing direct lines of communications among more than 85 countries. Through earth stations or through terrestrial connections, some 122 countries, territories and possessions use the services of the global system full-time. 

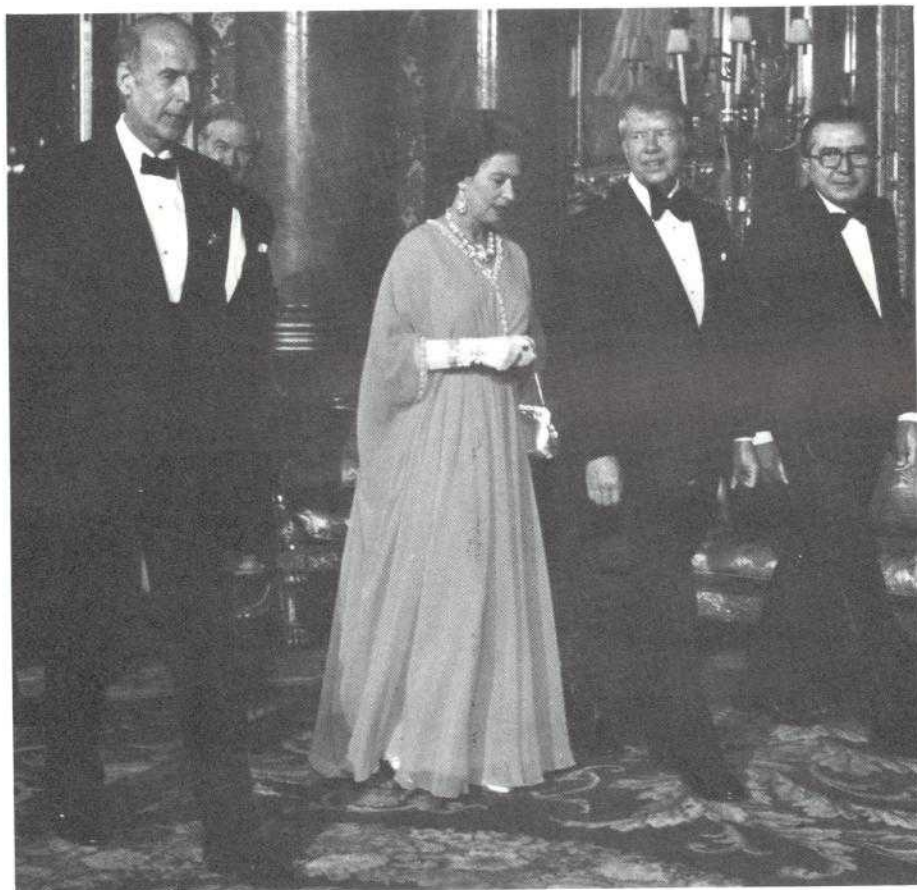


*The inauguration of Jimmy Carter as the thirty-ninth President of the United States and his meetings with the heads of state during the year were viewed widely on satellite television.*

1977

IN

FOCUS



COMSAT's operations continued to expand in 1977.

Full-time services to the carriers through the global system increased substantially; MARISAT service to the U.S. Navy was extended into the Indian Ocean region to provide the Navy with worldwide maritime satel-

lite communications coverage; and Satellite Business Systems, in which COMSAT GENERAL holds a partnership interest, is approaching the second phase of a Pre-Operational Program leading to the provision of its unique, all-digital domestic satellite service by 1981.

**Global System Services.** At the end of 1977, COMSAT was leasing 5,315 half-circuits, including 958 half-circuits between the U.S. mainland and Puerto Rico, to the international carriers for telephone, message, data and facsimile communications. This was 19 percent more than the total leased at the end of 1976.

It is expected that the mainland-Puerto Rico traffic will be transferred to a domestic satellite system in mid-1978, pursuant to the FCC policy under which the mainland-Alaska and mainland-Hawaii traffic was transferred to domestic systems in 1973 and 1976, respectively.

COMSAT also provides satellite channels for television transmissions, and half-circuits for temporary services to meet peak holiday and special events requirements and to restore communications service when there are undersea cable breaks or outages.

COMSAT's television services in 1977 totaled 1,665 half-channel hours, 101 more than in 1976. President Carter's trips to other countries and the Sadat-Begin Middle East peace negotiations, which could have been viewed by more than one out of every four persons on earth, dominated international news in 1977.

COMSAT's temporary services in 1977 totaled 9,298 half-circuit days, 1,728 fewer than in 1976, but more than half of the temporary services provided by COMSAT in 1977 were to restore service interrupted during cable breaks.

**Digital Communications Services.** COMSAT's digital communications services expanded at an annual rate of 35 percent in 1977.

At year-end, the U.S. and more than 30 countries in the Atlantic Ocean region were operating with the SPADE system, an all-digital, demand-assignment telephony service introduced in 1973. This high-speed digital data service initiated in 1971 now links the U.S. with nearly a dozen countries in the Atlantic and Pacific Ocean regions. And DIGISAT, COMSAT's low/medium-speed digital data service which was previously available only between the U.S. mainland and Hawaii, was approved by the FCC for use also in the Atlantic Ocean region.

The unique broadband transmission capability of the satellite offers significant service economies, particularly to data users requiring digital communications networks capable of transferring increasingly larg-

er volumes of information at higher transmission speeds.

**Space Segment.** In 1977 the third of the 6,000-circuit INTELSAT IV-A satellites was placed in service in the Atlantic Ocean region where the demand for satellite service is the greatest.

After the successful launch of the first three satellites in this series, the fourth was lost in September 1977 because of a malfunction of the launch vehicle. This satellite was to be the first of two IV-As intended for service in the Indian Ocean region where the demand for satellite service is growing most rapidly.

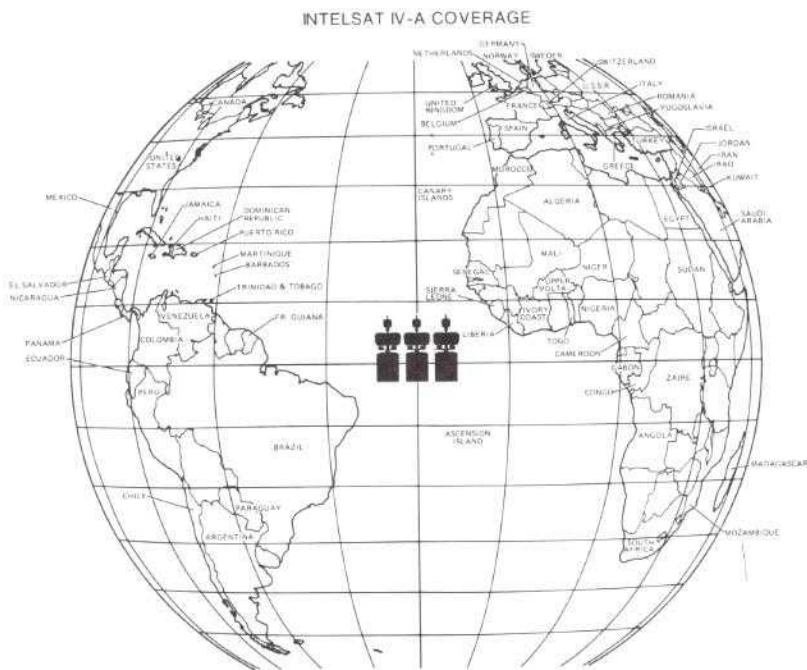
On January 6, 1978, the first of the Indian Ocean IV-As was launched successfully; it is planned for service beginning in July. The second Indian Ocean IV-A is scheduled for launch no later than April.

A 4,000-circuit INTELSAT IV satellite continues to provide service in the Pacific Ocean region where the growth in satellite service is not as rapid as in the Atlantic and Indian Ocean regions.

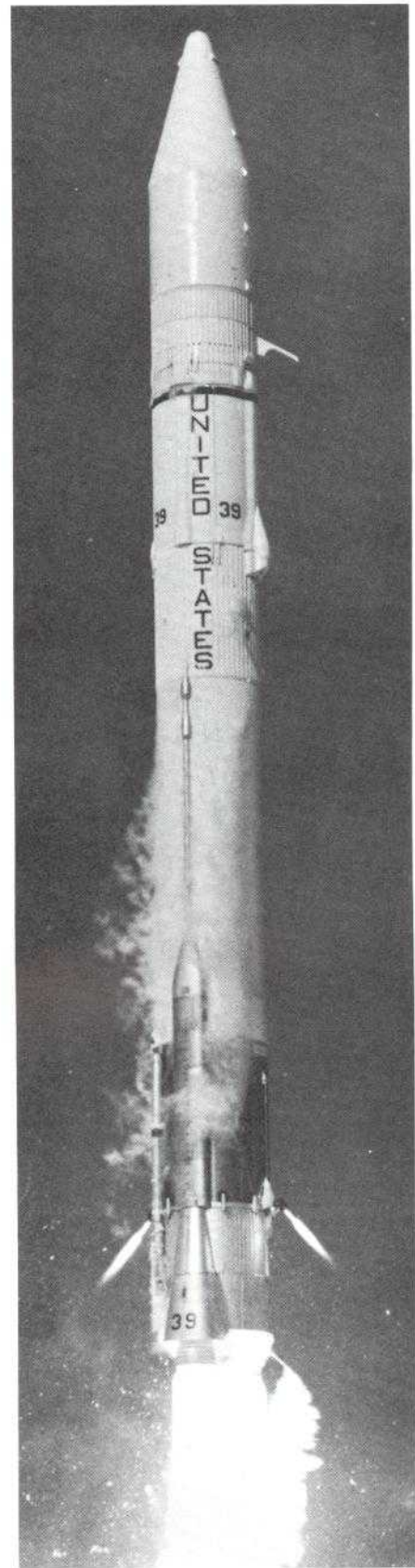
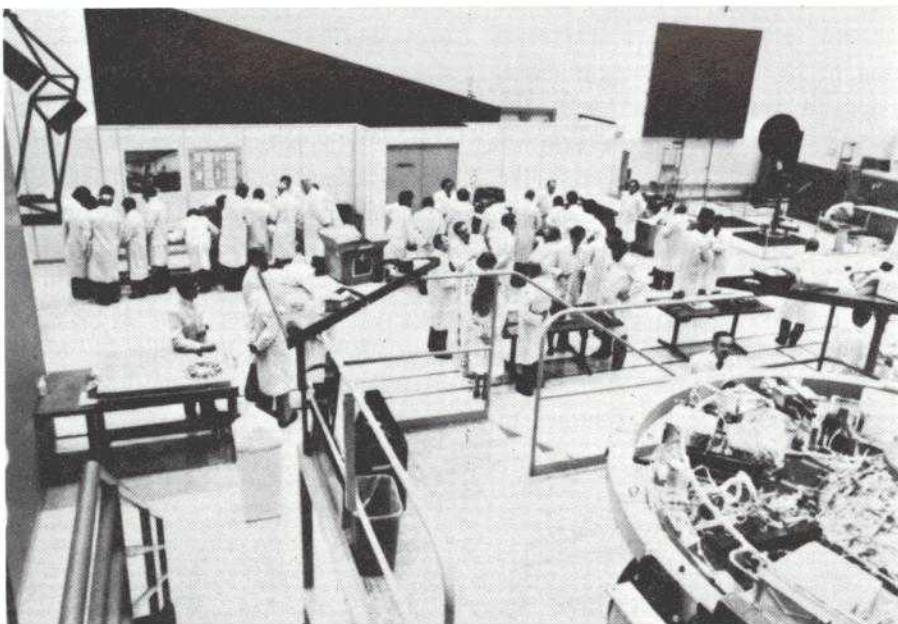
Construction of the new 12,000-circuit INTELSAT V satellites was begun in 1977 by the Ford Aerospace & Communications Corporation with the first of the seven satellites in the series scheduled for launch during the latter part of 1979.

*(Continued on page 6)*

# Third INTELSAT IV-A launched successfully



**INTELSAT Board of Governors  
visits Ford Aerospace, prime  
contractor for INTELSAT V**



*(Continued from page 4)*

**E**arth Segment. The worldwide network of earth stations was expanded in 1977 by the addition of 44 antennas and 37 earth station sites, and by the addition of six countries. This increase in station facilities exceeds the previous record of growth for a single year established in 1976. At the end of 1977, there were 201 antennas at 163 station sites in 88 countries. Of these numbers, 147 antennas at 115 station sites in 87 countries were being used to provide international communications services. The remaining station facilities are being used by countries for domestic or specialized services through capacity leased in global system satellites.

At the end of 1977 there were 558 satellite pathways providing direct lines of communication among countries with earth stations, 64 more than a year ago. Since satellite services are extended through terrestrial connections to countries which do not have earth stations, 122 countries, territories and possessions were using satellite services full-time. COMSAT's services were putting the U.S. in touch with 96 of them through seven U.S. earth stations for international communications.

To prepare for operation with the INTELSAT V satellites, planned as the primary means of satellite communications in the Atlantic Ocean region in the 1980s, COMSAT has asked the FCC for authority to construct 56-foot diameter antennas capable of operating in the higher, 11- and 14-gigahertz frequencies, at Etam and at Lenox, West Virginia, approximately 22 miles northwest of the primary

site at Etam. The higher transmission frequencies, to be available in the INTELSAT VS, require the availability of alternate antenna sites to minimize the interference effect of heavy rains which are frequent in the Eastern U.S.

**M**arisat Services. The MARISAT System, developed and operated by COMSAT GENERAL, provides high-quality satellite communications services to the U.S. Navy and to the commercial shipping and offshore industries.

The MARISAT System achieved three-ocean coverage in December 1976 when the third satellite in this series was made available for service over the Indian Ocean to accompany satellites placed in service over the Atlantic and Pacific Oceans earlier in 1976. The Navy provides its own mobile and fixed terminals to operate with the satellites; COMSAT GENERAL sells or leases mobile terminals for commercial use.

All three satellites of the MARISAT System are providing service to the Navy. In July 1977 the Navy agreed to extend its use of the satellites to a period of five years ending in 1981. Service to the Navy through the MARISAT System began in the Atlantic region in March 1976, in the Pacific region in June 1976 and in the Indian Ocean region in January 1977.

The MARISAT System also has been providing service to commercial customers in the Atlantic and Pacific Ocean regions since the summer of

1976. An agreement was reached in 1977 with Kokusai Denshin Denwa Company, Ltd. (KDD), a Japanese telecommunications carrier, to extend MARISAT service to commercial customers in the Indian Ocean region beginning in mid-1978. The MARISAT joint venture will provide capacity in the MARISAT satellites to KDD which will construct and operate a communications earth station in Japan.

COMSAT GENERAL's wide range of commercial MARISAT services includes telephone, telex, facsimile and data communications. More than 90 commercial ships and offshore oil drilling facilities of 13 countries are now equipped with COMSAT GENERAL's terminals, three times the service being provided a year ago.

The MARISAT satellites have a five-year design life. Thus, COMSAT is exploring various alternatives to provide for a continuation of service beyond 1981.

**C**OMSTAR Services. Two of the three COMSTAR satellites, the entire capacity of which COMSAT GENERAL has leased to AT&T, are providing U.S. domestic communications services through four earth stations operated by AT&T and through three earth stations operated by GTE Corporation under a subleasing arrangement with AT&T. The two operating COMSTAR satellites have been in service since mid-1976. The third satellite is scheduled for launch in June 1978. A fourth satellite has been contracted for as an on-the-ground spare.

*(Continued on page 8)*

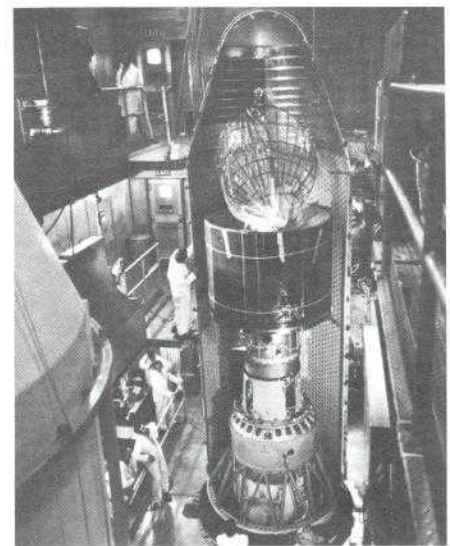
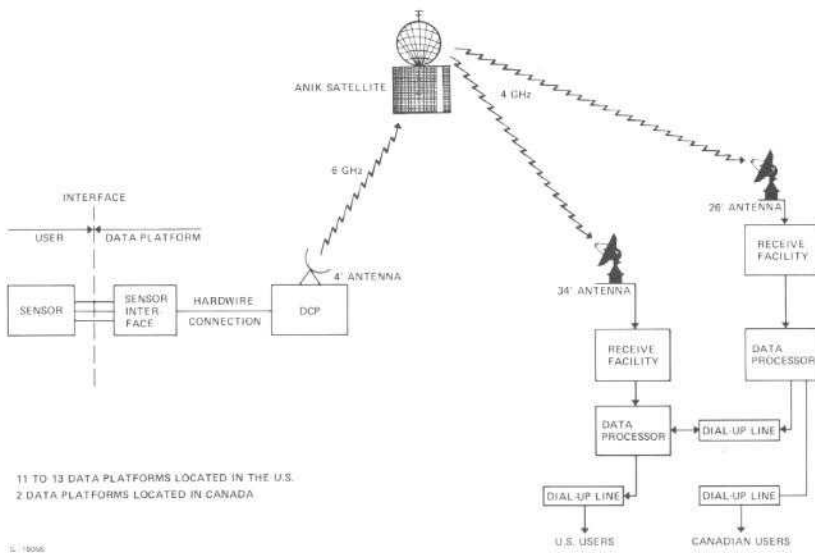




*A small antenna transmits hydrological data by satellite to receive points in the United States and Canada.*

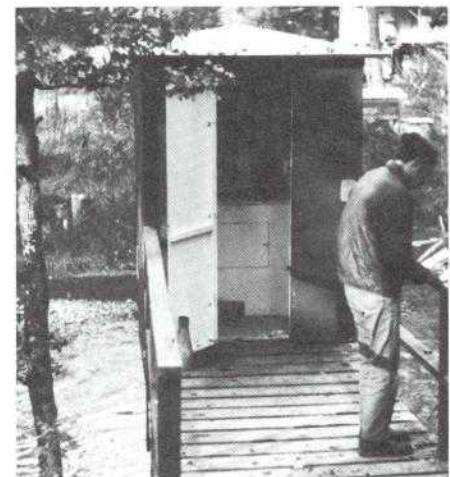
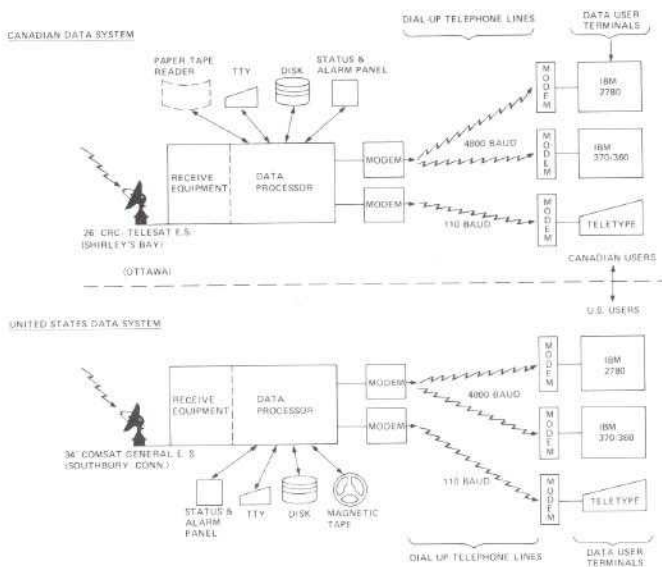
# COMSAT, Telesat and USGS explore satellite usage for monitoring environmental resources

## SYSTEM CONFIGURATION



*Telesat Canada's Anik (Eskimo for "brother") satellite carries hydrological data from data collection platforms (DCPs) to central receive and distribution points (top photo). A typical stream gauge station is shown below.)*

## TYPICAL DATA FLOW CONFIGURATION



(Continued from page 6)

The COMSTAR satellites perform two unique functions: they are the first and only domestic satellites to provide nationwide message telephone toll services and they are the only commercial satellites to carry the equipment required to investigate the possibilities of transmitting communications at frequencies as high as 19 and 28 gigahertz.

**Satellite Business Systems.** Satellite Business Systems (SBS) was formed in 1975 by subsidiaries of COMSAT GENERAL, Aetna Life & Casualty and IBM Corporation to provide a unique, all-digital domestic service, principally to businesses and government agencies with large communications requirements. Using satellites operating at 12- and 14-gigahertz frequencies with small ground antennas, the SBS system, planned for commercial operation beginning in 1981, will enable customers with widely dispersed locations to combine voice, data and image communications into a single, integrated, all-digital, private-line, switched network.

In February 1977 the FCC authorized SBS to proceed with construction of facilities to provide its proposed services subject to various terms and conditions. Subsequently the three partners notified each other and the FCC that they would proceed under the terms of the FCC authorization and their initial agreement as one-third partners, and increased their commitment from \$55 million each to \$75 million each, or a total initial investment of \$225 million.

Pursuant to the FCC authorization, SBS began the first phase of a two-

phase Pre-Operational Program, using communications capacity in an existing domestic satellite operating at the 4- and 6-gigahertz frequencies, although the ultimate system will operate in the 12- and 14-gigahertz frequencies. Under Phase I of the program, SBS has been conducting traffic tests between its small earth stations at Poughkeepsie, New York, and Los Gatos, California.

Under Phase II of the Pre-Operational Program, scheduled to begin in the spring of 1978, SBS will provide common carrier communications services to IBM, under tariffs filed with the FCC, among the stations at Poughkeepsie, Los Gatos and the recently-constructed earth station at Research Triangle Park near Raleigh, North Carolina. Phase II of the Pre-Operational Program will continue until the SBS system becomes operational.

During the latter part of 1977 and early 1978, SBS coordinated an experiment, *Project Prelude*, to demonstrate the benefits of combining satellite communications in the 12- and 14-gigahertz bands and advanced business equipment for meeting intracompany communications requirements of the future. Two small transportable earth stations, built by COMSAT Laboratories, were used in conjunction with the Communications Technology Satellite, operated by NASA and the Canadian government, to link pairs of facilities owned by Rockwell International, Texaco and Montgomery Ward.

In December 1977 SBS awarded a \$63 million contract, including full performance incentives, to Hughes Aircraft Company for three satellites to operate in the 12- and 14-gigahertz frequencies: two operational and one as a spare, SBS plans to

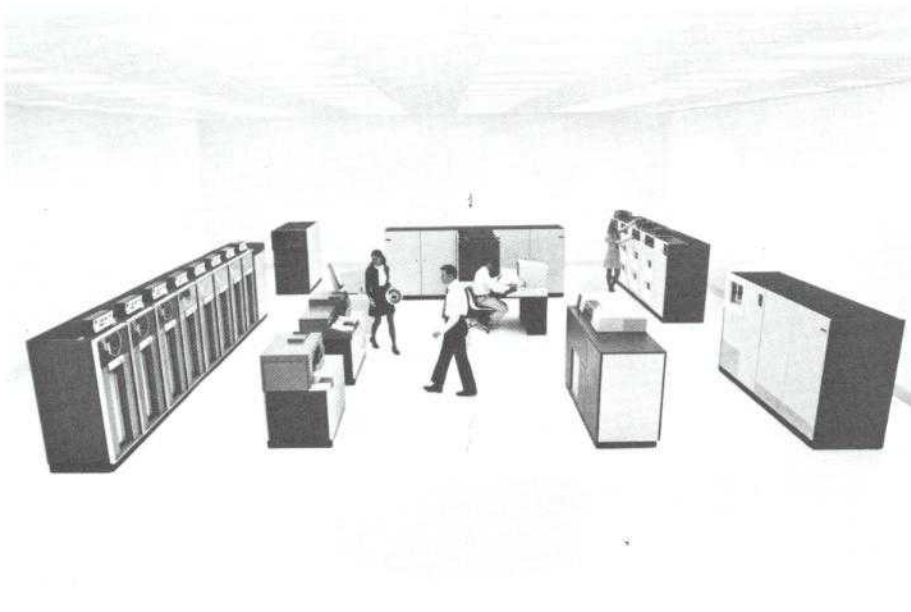
launch the first of these satellites in 1980 and to begin commercial operation in 1981.

**Other Activities.** COMSAT GENERAL provides worldwide technical and operational services which encompass a broad range of management and engineering activities in many phases of telecommunications planning, construction and operation. Forty of the current 88 countries with earth stations have used these services. During 1977 technical services were provided to 13 countries under ongoing contracts, and new contracts were negotiated with two countries, Upper Volta and Ireland.

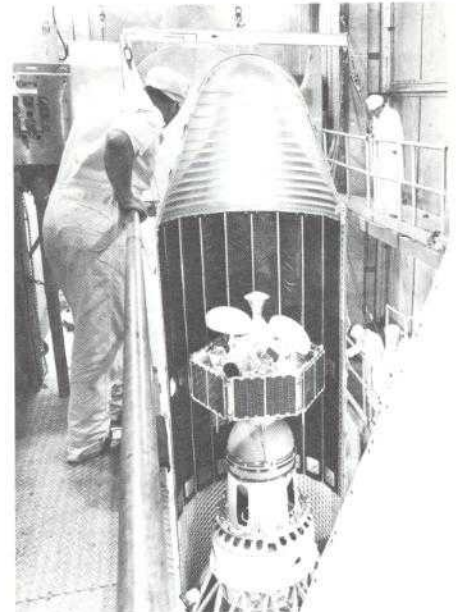
COMSAT GENERAL in 1977 continued to provide technical services to and to hold minority interests in companies operating earth stations in Nicaragua and Panama.

COMSAT GENERAL in October 1977 began participating with the U.S. Geological Survey (USGS) and TELESAT Canada in a six-month developmental program to demonstrate the monitoring capability of satellites and small, unattended earth stations for the collection of water resources data from remote areas of the U.S. and Canada. From COMSAT GENERAL's small antennas placed adjacent to USGS monitoring sites, data is transmitted via a TELESAT satellite to COMSAT GENERAL's Southbury, Connecticut, earth station where it is distributed terrestrially to USGS offices. This joint developmental program is the first use of commercial satellite facilities for the everyday collection of environmental data from remote locations.





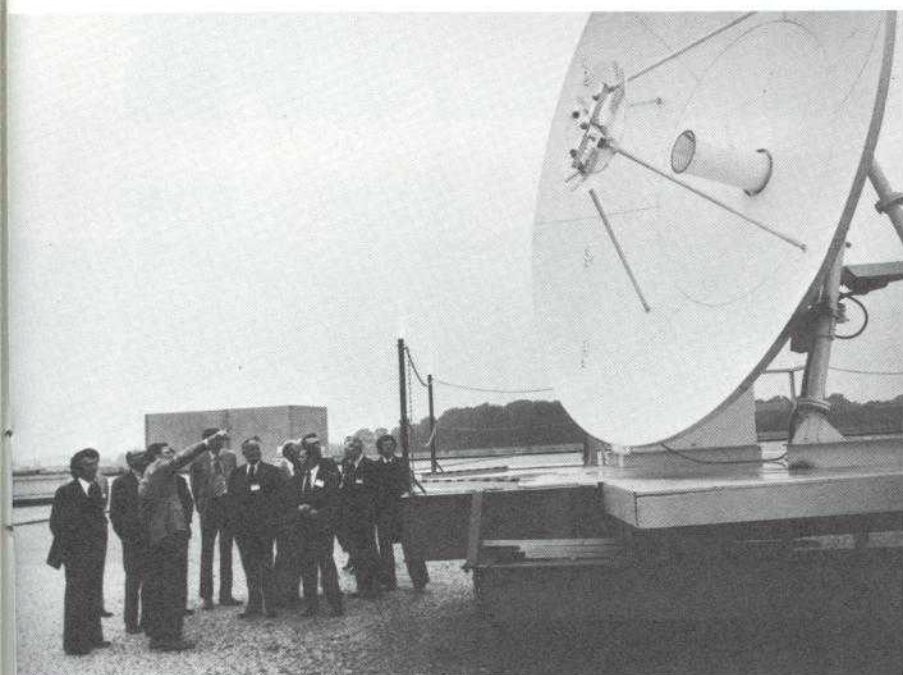
*The IBM 370/158 Computer*



*The Symphonie Satellite*

## Experiment for computers

*COMSAT's Kim Kaiser, pointing, describes five-meter antenna mounted on the roof of the IBM Building in Gaithersburg, Maryland, to communications officials visiting the site. The antenna is being used in a joint COMSAT/IBM digital data experiment between the United States and Europe using the French Symphonie satellite. Shown at the right is the LaGarde Terminal in France.*



**People's Republic of  
China accedes to  
INTELSAT Agreement**

*Mr. Chi-Mei Hsieh signs the INTELSAT Operating Agreement on behalf of the People's Republic of China as INTELSAT Director General Santiago Astrain looks on.*

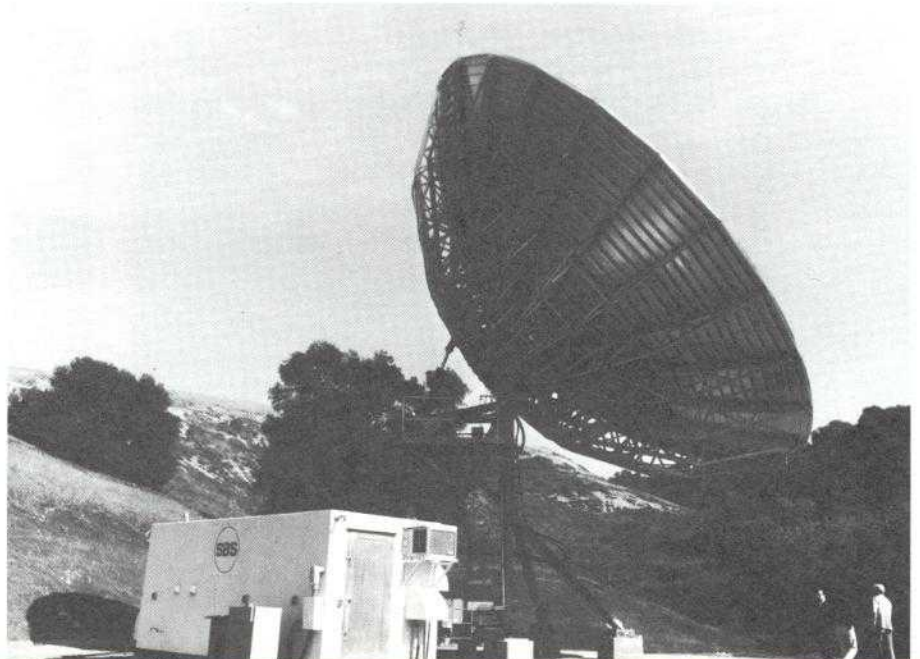


**Noted author visits Labs**

*Mr. Clarke is one of the world's leading science-fiction writers and authorities on space and underwater exploration. He is credited with originating the concept of using satellites for global communications. In 1945 he described with remarkable accuracy how three satellites placed in synchronous orbit could provide communications coverage worldwide.*

**SBS stations begin tests**

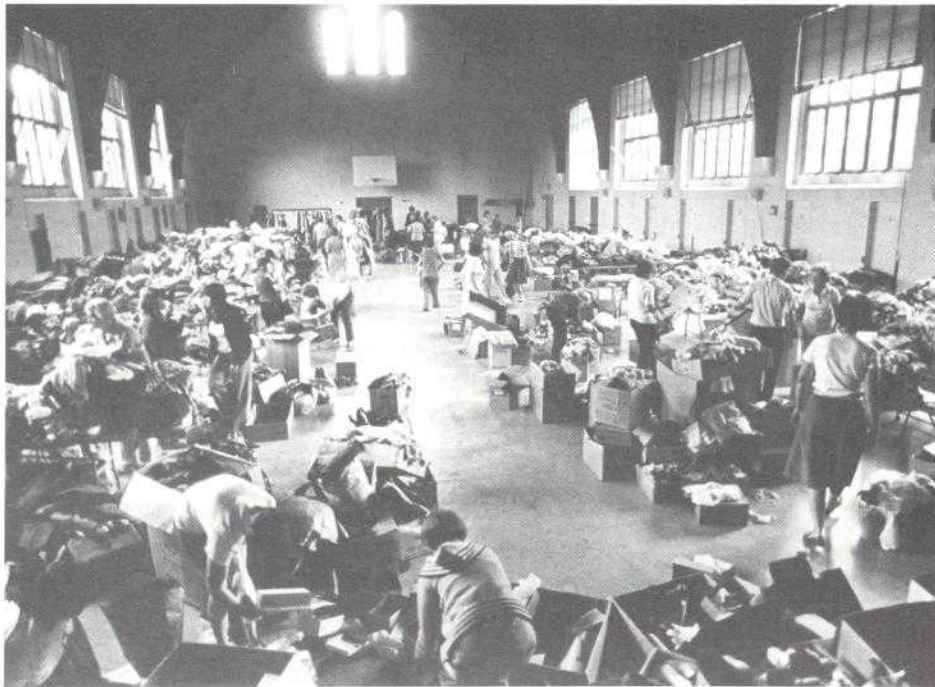
*SBS began preoperational program traffic tests in 1977 using two small earth stations located at Poughkeepsie, New York, and Los Gatos, California. The preoperational program is being conducted in the 6- and 4-GHz frequencies, unlike the SBS operational system which will operate in the higher 14- and 12- GHz frequencies.*





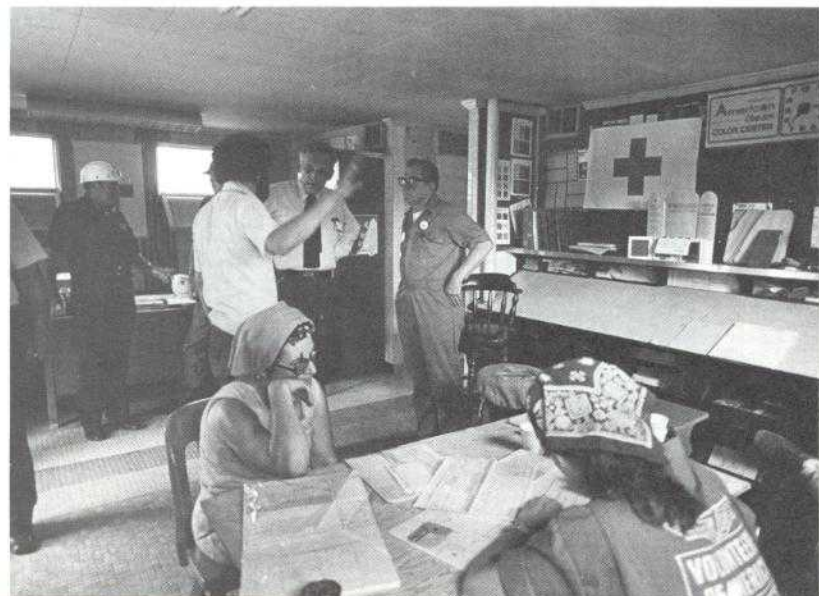
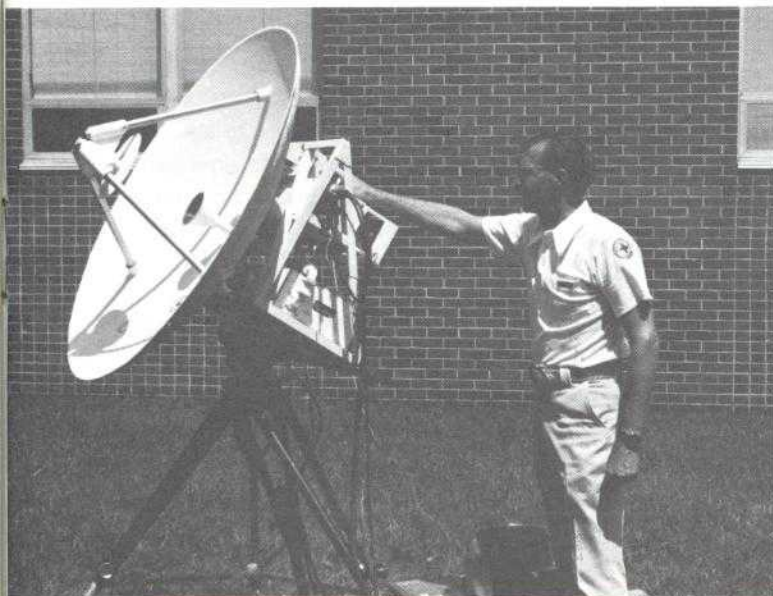
**FLOOD '77**  
Friday, August 19, 1977  
Section III Pages 33 to 48

# Satellite fills gap at Johnstown



*COMSAT's Kim Kaiser adjusts terminal in Johnstown.*

*The Red Cross Operations Center in Johnstown.*



## R&D program advances satellite technology

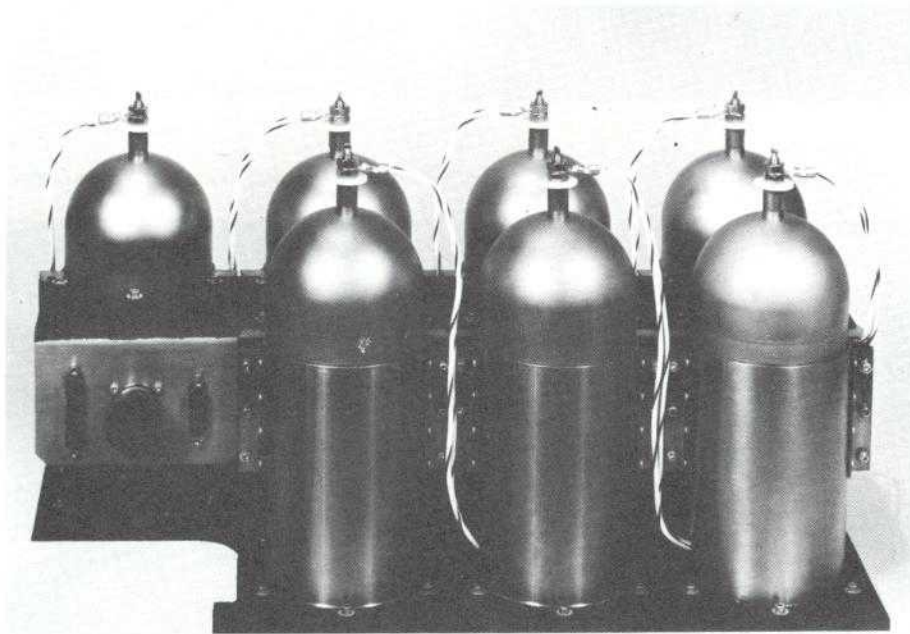
COMSAT continues to make significant contributions to the advancement of satellite communications technology through the research and development programs of COMSAT Laboratories, the engineering support provided to current satellite systems and the development of satellite systems of the future.

COMSAT's research and engineering programs are directed essentially toward the development of more powerful and longer-life multiple-beamed satellites operating with smaller earth stations in the higher communications frequencies. These

programs are leading to a more efficient use of the frequency spectrum allocated for satellite communications through techniques that permit the simultaneous, multiple use of the same frequency bands, and the transmission of all types of communications (voice, video and data) in high-speed digital rather than conventional analog forms. A summary of the major research and engineering achievements of 1977 follows:

- The nickel-hydrogen batteries developed by the Laboratories, under INTELSAT sponsorship, are performing satisfactorily on the U.S. Navy Nav-

*The Nickel-hydrogen battery developed by COMSAT Laboratories under INTELSAT R&D sponsorship represents an advance in secondary power sources for communications satellites.*



igation Technology Satellite (NTS-2) launched in mid-1977. These batteries, used to power satellites during launch and solar eclipse periods, are much lighter and are demonstrating a longer design life than the seven-year life of the nickel-cadmium batteries now being used.

- The data being collected from the Labs-built 13- and 18-gigahertz transponders aboard the ATS-6 satellite and the 19- and 28-gigahertz beacons aboard the COMSTAR satellites are providing the information needed to overcome the rain interference problem encountered in these parts of the frequency spectrum. In addition a computerized program is defining interference expectations for various frequencies and earth station site locations, and it is predicting year-to-year weather variations as a basis for operations planning in the higher frequency bands.

- A simulator is performing the communications functions expected of the INTELSAT V satellites planned for use in the global system in the 1980s. These satellites will employ various frequency reuse techniques, and they will also operate in the higher 11- and 14-gigahertz frequencies. The simulator permits the early identification of problems inherent in introducing such advanced transmission techniques, and the establishment of operational plans that take advantage of the unique characteristics and capabilities of these high capacity satellites. Another simulator is enabling COMSAT GENERAL to monitor constantly the efficiency of MARISAT system operations, and to evaluate new maritime satellite communications services without interrupting or disturbing the operational system.

- New communications processing equipment which converts conventional analog signals into digital signals and vice versa was developed and successfully tested under operating conditions. This equipment provides an efficient and economical means for interconnecting present analog systems with developing dig-

ital systems.

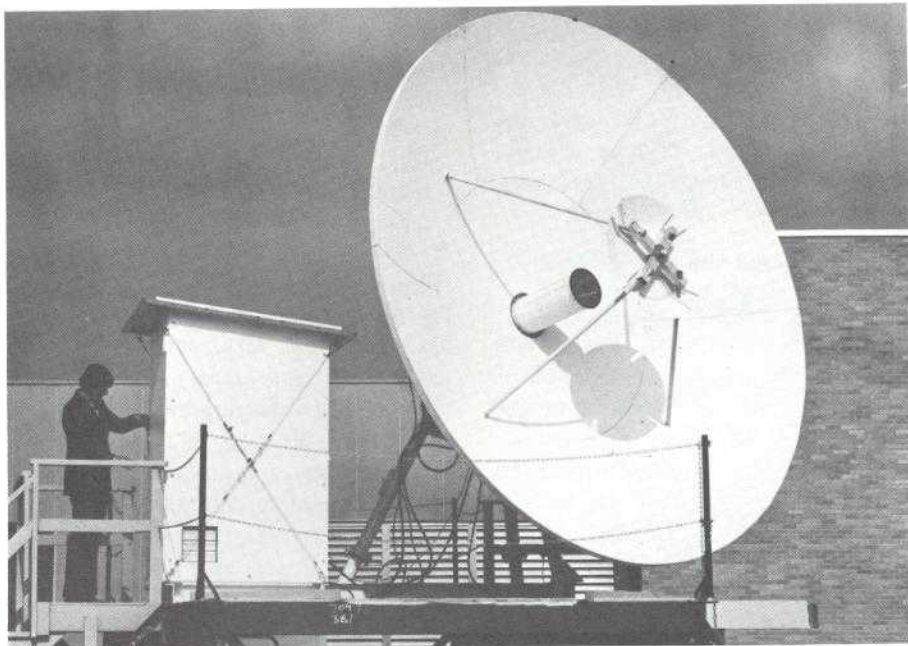
- The automatic satellite-switching of digital communications transmitted over different spot beams, but on the same frequencies, was carried out successfully in an operating environment. Satellite switching promises significant economies and more efficient use of the frequency spectrum when operating with satellites using large numbers of spot beams.

- Small earth stations located in Gaithersburg, Maryland, and La Gaude, France, linked computers via satellite to transmit large volumes of business data virtually error-free at a rate of 1,500,000 bits of information per second. This demonstrated for the first time the feasibility of interconnecting distant computer information storage centers without having to go through conventional low-speed input-output devices.

- Satellite links established between small terminals located at COMSAT Laboratories and a roving NASA mobile van successfully relayed analog voice, video and data communications in digital form at a rate of 43,000,000 bits of information per second and at a lower error-rate than ever before achieved at such a high rate of transmission.

- Small Labs-built-and-designed transportable earth stations were used by Satellite Business Systems in a series of highly successful communications experiments in the 12- and 14-gigahertz frequencies between pairs of corporate locations. These experiments demonstrated the potential benefits of combining satellite communications and advanced business equipment to meet intra-company communications requirements of the future.


- An extensive study by Bell Labs comparing the quality of telephone calls made over satellite circuits equipped with echo cancellers developed by the Laboratories and calls made over terrestrial circuits equipped with conventional echo suppressors revealed that the quality of calls via satellite was as good as, or better than, those made via terrestrial



*A rooftop antenna erected on the IBM Building in Gaithersburg, Maryland, by COMSAT Labs, is used in a computer-to-computer experiment between the United States and IBM's LaGaude Research Center in France.*

circuits.

- Rapid progress continues to be made in the development of microwave integrated circuits for use in satellite, earth station and communications processing components. Al-

though this technology presents demanding design challenges, it makes possible significant reductions in component size, weight and cost and increases in reproducibility and reliability. 

*NASA's portable earth terminal used in the Digitally Implemented Communications Experiment (DICE) conducted jointly by COMSAT Laboratories and the NASA-Lewis Research Center to demonstrate the flexibility and efficiency of digital transmission of television video and audio, telephone voice and high-bit-rate data.*



The Thirtieth Meeting of the INTELSAT Board of Governors was held in December 1977. With the accessions of Upper Volta and the People's Republic of the Congo, INTELSAT now has 101 members. Among its actions the Board:

#### **Organizational and Administrative Matters**

- Approved a structure, staffing and grades for the Operations Division of the Operations and Development Directorate, and for the Administration Directorate, and approved the addition of four positions to the Finance Directorate.

- Authorized the Director General to search for a suitable site in Washington, D.C. for the construction of a building to meet INTELSAT's long-term space requirements.

#### **Technical and Operational Matters**

- Requested the Director General to develop an improved operational plan for the period beginning January 1979, with particular attention to the need to maintain diversity on major traffic streams between multiple-antenna users and the interactions of the Atlantic and Indian Ocean Regions; to develop an operational plan for the INTELSAT V based upon the earth station antennas which are expected to be available by the end of 1979; and to convene a workshop of interested Atlantic and Indian Ocean Region Operations Representatives in the second half of February 1978, to discuss the development of these plans. The Board also requested the Advisory Committee on Technical Matters to review INTELSAT IV-A transmission planning with the objective of increasing available transponder capacity.

- Decided to re-examine all aspects of operational planning at its June 1978 meeting and requested the Director General to develop for that meeting a set of earth station implementation guidelines which would assist earth station owners in the realization of their service needs in a manner consistent with the best use of space segment resources.

## **INTELSAT Board cuts full-time charge for eighth year in a row**

- Decided to keep the Atlas-Centaur, Ariane and STS/SSUS-A launch services possibilities open as long as practicable consistent with operational requirements, satisfactory progress in the respective development programs and reasonable cost to INTELSAT for each program, and authorized the Director General to commit the sum of \$4,743,000 to NASA for the SSUS-A program. The Board also requested the Director General to negotiate with NASA the possible restoration to NASA's program of an early SSUS-A demonstration flight.

- Noted that the Director General will continue negotiations with ESA, EACC and NASA toward the definition of launch services contracts and requested the Director General to take all necessary measures to define the program for INTELSAT V compatibility with Ariane by February.

- Decided that the Atlantic Major Path 2 satellite have an operational location of 342° E. Longitude, and authorized the Director General to apply the appropriate ITU processes leading to new registration of INTELSAT satellites at eight new locations in the Atlantic and Indian Ocean Regions.

- Approved the establishment of an Integrated Traffic Data Base, consolidating the five-year Traffic Data Base and new long-term forecasts; and approved system-wide collection of long-term forecasts once every two years.

- Expressed in the form of a recommendation its finding that the planned Canadian domestic Telesat B-1 and C-1 and C-2 networks, with the specified television procedures and technical and operational parameters, are compatible with the use of the radio frequency spectrum and orbital space by the existing or planned INTELSAT space segment.

- Adopted full and fractional trans-

ponder definitions and operating constraints recommended by the Advisory Committee on Technical Matters as guidelines to be used with systems operating with leased hemispheric transponders in INTELSAT IV-A satellites.

- Approved, in principle, the allotment of one-half transponder of spare space segment capacity to Saudi Arabia on a preemptible basis for domestic public telecommunication services.

- Extended approval until January 1979 for the U.S. unattended earth terminal to access Atlantic Ocean Region satellites for experiments and demonstrations; until June 30, 1978, approval for the Lario (Italian) antenna to access the space segment for depolarization experiments; and until May 31, 1978, approval for the Isfjord (Norwegian) antenna to establish quantitative measurement of propagation conditions. The Board also approved eleven Saudi Arabian non-standard stations for access under Saudi Arabia's leased capacity, subject to certain conditions.

#### **Legal and Financial Matters**

- Approved the 1978 INTELSAT Budget, comprising \$154.4 million in capital expenses, \$175.1 million in revenues, \$35.2 million for Executive Organ and Management Services Contractor operating expenses and \$73.5 million for depreciation. The Board granted a 6.9 percent cost of living increase effective January 1, 1978, to the salary structure of the Executive Organ in recognition of the estimated increase in the Washington Consumer Price Index, and requested the Director General to study the continuing appropriateness of current salary structure policy in the light of experience in the application of this policy and of present circum-





**INTELSAT IV-A launched**

*A fourth INTELSAT IV-A was successfully launched from Cape Canaveral, Florida, at 7:15 p.m., EST, Friday, January 6. The new, high-capacity communications satellite will replace a smaller-capacity INTELSAT IV that has provided service in the Indian Ocean Region since mid-1975 and which will subsequently be transferred to provide service in the Pacific Ocean Region. The INTELSAT IV-A will be positioned over the coast of Africa at 63° E. Longitude.*

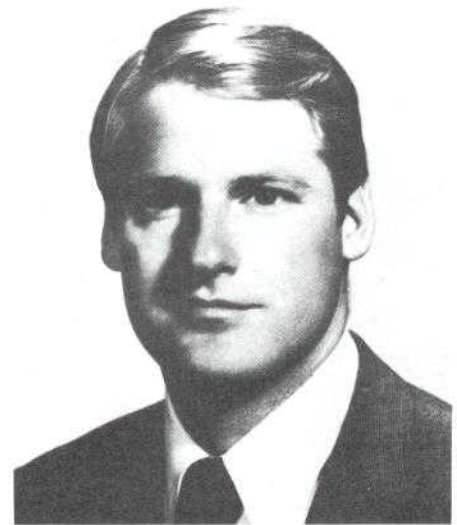
## **Bodman elected Senior VP, Finance/Corporate Development**

Richard S. Bodman has been elected Senior Vice President, Finance and Corporate Development, by the Board of Directors of COMSAT effective February 1, 1978.

Mr. Bodman has been associated with E. I. duPont de Nemours & Company, Inc., since 1973 and has been Assistant Comptroller and Director of the Corporate Accounting Division since November 1977. He was Regional Marketing Manager of the Textile Fibers Department from 1976 to November 1977, Product Manager of Textile Fibers from 1975 to 1976, and Assistant Treasurer and Assistant Manager of the Foreign and Banking Division from 1973 to 1975.

Before joining duPont, Mr. Bodman served from 1971 to 1973 as Assistant Secretary for Management and Budget of the U.S. Department of Interior. From 1961 to 1967 he was a member, and from 1967 to 1971 a General Partner, of the public accounting firm of Touche Ross & Company.

Mr. Bodman attended Princeton



University, receiving a Bachelor of Science degree in Engineering in 1959, and the Alfred P. Sloan School of the Massachusetts Institute of Technology, receiving a Master of Science degree in Industrial Management in 1961. He became a Certified Public Accountant in 1963.

A native of Detroit, Mr. Bodman is married to the former Helene Kempton Dunn of New Canaan, Connecticut. They have five children.

stances.

- Approved a research and development program for 1978 of \$5,620,000 comprising \$1,420,000 for exploratory research and studies, \$2,095,000 for in-house expenditures on development projects, and \$2,105,000 for new contracts.
- Decided to reduce the full-time space segment charge from \$7,380 to \$6,840 per annum (\$570 per month) and the SPADE charge from nine cents to eight cents per minute, effective January 1, 1978, and to maintain occasional use charges at existing levels.
- Decided to maintain the rate of compensation for use of Signatories' capital at 14 percent per annum.
- Authorized the Director General to enter into overdraft arrangements pursuant to Article 10(a) of the Operating Agreement, with a limit

of \$10,000,000 U.S.

- Decided that the original Ivory Coast proposal to the Second Assembly of Parties, regarding the establishment of a solidarity fund, which was referred to the Board in order that a recommendation could be provided to the Third Assembly of Parties, is inconsistent with the provisions of the INTELSAT Agreements and absent modification of these Agreements could not be implemented. The Board noted that it would consider at a future meeting any revised or new contributions with the aim of determining whether the legal, financial and administrative aspects of such proposals could lead to a sound recommendation for further action.
- Approved the loan of the INTELSAT MESIC ion thruster to Xerox Electro-Optical System and the loan of the

INTELSAT double-gimballed momentum wheel and associated equipment to TRW Systems.

- Authorized the Director General to conclude a licensing agreement with Eagle-Picher, Inc., for nickel-hydrogen technology and to conclude licensing agreements with other prospective licensees for this technology in accordance with established policy and basic terms and conditions.
- Endorsed several contracts, containing modifications to standard INTELSAT contract articles, and decided to consider at a subsequent meeting the policy to be followed with respect to the manner in which it addresses requests for deviations from standard INTELSAT contract terms and conditions.

The Thirty-first Meeting of the Board was scheduled to be held in February 1978.

## Contribution of Labs personnel to communications satellite research depicted in mural



*COMSAT President Charyk, Artist Terry Rodgers and Labs Director B. I. Edelson (left to right) in front of Rodgers' mural following dedication ceremonies.*

Terry Rodgers' *People and Technology*, a 13 x 30-foot mural in the COMSAT Laboratories lobby, was unveiled at a dedication ceremony on January 5, 1978. Edwina Charyk, wife of COMSAT President Joseph V. Charyk, dedicated the mural.

The mural shows Labs personnel involved in various tasks, giving viewers a wonderful capsule description of the many aspects of satellite communications research. The 38 people shown in the work are all Labs employees. Rodgers said the subject for the mural was chosen by the Labs Art Committee.

*People and Technology* is the third mural Rodgers has done for the Labs. One shows the INTELSAT IV-A satellite shortly after launch and the other is of the various instrumentations at the Labs.

Approximately 100 people attended the dedication ceremony and the reception which followed.



*In the photo at left, Mrs. Edwina Charyk, wife of COMSAT's President, unveils Rodgers' mural at the dedication.*

*Artist Rodgers at work on his *People and Technology* mural in the Labs lobby prior to its dedication in January.*



## Satellite hook-up brings Sadat appearance to U.S.

Egypt's President Anwar Sadat's appearance before the Israeli Parliament was heralded by most nations as a major step forward in Middle-East peace efforts. To most people it meant a lessening of worldwide tensions. But to those whose job it was to bring the historic event to television viewers here in the United States it meant hours of feverish and complex activity into the early morning prior to President Sadat's address.

The events leading to his address had already put heavy demands on Atlantic Ocean satellites and additional capacity was required to bring his Sunday morning telecast into the living rooms of American viewers. Previous commitments for other events had already been scheduled over the four television channels of the Atlantic region.

"Late Saturday night," said Lawrence Covert, COMSAT's Operations Center Manager, "we knew bringing the Sadat speech live to the U.S. was going to be a problem for the networks because the event was going to be transmitted from Israel to the satellite in a European television format." According to Covert, "the U.S. networks would have to convert the European television standards to U.S. standards before it could be brought into the American home as an intelligible picture. Unfortunately, such television conversion equipment was not available in the U.S."

## COMSAT Board of Directors declares quarterly dividend

The Board of Directors of COMSAT has declared a quarterly dividend at the increased rate of 50 cents per share, payable on March 13, 1978, to all shareholders of record as of the close of business on February 10, 1978.

The 50-cent per share dividend

*Editor's Note: American TV uses 525 horizontal lines of light for each picture, or "frame"—Europe uses 625. The color coding is different in the two systems and, because Europe uses 50-cycle electric current and America uses 60-cycle, the number of frames shown per second is different. To change all of these factors during the transmission and produce a picture which will appear the same to a viewer using the other system takes a small room full of sophisticated (and expensive) equipment.*

It was finally agreed that the United Kingdom and Germany would make the necessary conversion facilities available at their station since they were scheduled to receive the Sadat telecast via satellite from Israel and distribute it throughout Europe. After many telephone calls and post-midnight negotiations between Washington and Europe, two additional satellite television channels were made available by reconfiguring a satellite. Antennas at Etam and Andover were pointed over to the reconfigured Atlantic satellite and COMSAT engineers began line-up tests with the European staff at the British Post Office in the United Kingdom and the Deutsche Bundespost in Germany.

The first telecast was scheduled to begin at 8:10 a.m. (EST) from Israel. Alignment and video tests between earth stations in Europe and the U.S. continued as airtime approached, and, at precisely 8:10 a.m., network broadcasters began to receive live coverage of President Sadat's address to the Israeli Parliament.

represents an increase of 15 cents from the previous quarterly dividend of 35 cents per share. Part of the increase relates to a reduction in the number of shares outstanding, resulting from COMSAT's recent purchase pursuant to a tender offer of 2,000,000 of the 10,000,014 shares that had been outstanding, and the remaining part represents an increase by the Board in the total quarterly dividend payout.

## Charyk receives AIAA award

COMSAT President Joseph V. Charyk has been awarded the 1978 Goddard Astronautics Award by the American Institute of Aeronautics and Astronautics.

The award is given annually "for the most notable achievement in the entire field of astronautics, honoring Robert H. Goddard, rocket visionary, pioneer, bold experimentalist, and superb engineer, whose early liquid rocket engine launches opened up the world of astronautics."

Dr. Charyk was presented a medal and certificate with the following citation: "...for his outstanding contribution to the development of satellite communication systems, and his leadership in their operational application to international, domestic, and maritime service."

The award was presented at the traditional Honors Night Banquet held in conjunction with the AIAA's 14th Annual Meeting and Technical Display at the Sheraton-Park Hotel in Washington, D.C.

## Stock certificate presented



COMSAT President Joseph V. Charyk, left, receives a stock certificate for two million shares of COMSAT stock purchased by the Corporation from Robert J. Vondrasek, Vice President of Continental Illinois National Bank and Trust Company of Chicago. Continental Bank acted as the Depository for COMSAT's tender offer.



# NOTES FROM PERSONNEL

## Tax Tips

*Editor's note. The following information is reprinted from material distributed by the Public Affairs Division of the Internal Revenue Service.*

Some people like changes; others prefer things the way they are. But no matter which side of the fence you're on, one thing is certain: when you fill out your 1977 tax return, you won't be able to avoid the many changes in the tax law brought about through recent legislation.

### Standard Deduction Replaced

You have probably heard that the standard deduction has been replaced by a zero bracket amount, which is a flat \$2,200 for singles and \$3,200 for marrieds, filing jointly. And there has been quite a bit of publicity about the new tax tables with the zero bracket amount, personal exemptions, and general tax credit built right in.

These changes affect most taxpayers, but don't require you to plan ahead. Because some of the new provisions however, do relate to preplanning, it makes sense to start gathering your records together and examining the tax consequences of some of your actions.

For instance, if you own capital assets, such as stock, bonds or real property that you intend to sell this year, are you aware that in order to qualify for long term capital gain or loss treatment, you must have owned that asset for more than nine months? The holding period in prior years was more than six months.

### Capital Loss Amount Increased

Do you also know that the amount of a capital loss you can use to offset your taxable income has been increased from \$1,000 to \$2,000?

Both of these changes can make a significant difference in your tax bill for 1977. Suppose, for example, that you never heard of the new nine month holding period, and you dispose of a capital asset after seven months, thinking that you will have to pay tax on only one-half of your profit. When you fill out your 1977 tax return you might be surprised at the amount of tax you owe.

If you have moved, or plan a move, in 1977, several changes in the tax law affect you. The distance requirement of 50 miles in order to claim moving expenses has been reduced to 35 miles.

In addition, the maximum deduction for pre-move househunting and temporary living expenses has been increased from \$1,000 to \$1,500. The deduction for expenses related to buying, selling, or renting a home has been increased by \$500 to \$3,000. Make sure you have records handy to remind you of all the expenses.

### Alimony and Child Support

Other changes that could mean a difference in your tax liability are in the areas of alimony, child support, and child care expenses.

Alimony, previously an itemized deduction, is now an adjustment to income, which means that an ex-spouse can claim on his or her tax return the amount of alimony he or she paid during the year without having to itemize.

If you make child support payments to a former spouse, you may have to pay more money now in order to claim your children as dependents on your tax return. In prior years, if the tax exemptions were not allocated in the divorce decree, and you were the noncustodial

parent, you had to contribute \$1,200 or more for the support of one or more children in order to take the dependency exemptions. That amount has now increased to \$1,200 for each child.

Expenses you pay for work-related child care may now be claimed as a tax credit. The credit is 20% of the amount you pay during the year for child care. The maximum amount of the credit allowed is \$400 for one child and \$800 for two or more children. Again, you should have complete records so you can take full advantage of any breaks coming to you.

### Older Americans Selling Homes

Older Americans who sell their homes in 1977 will be glad to learn that there has been a sizable change in the tax break available to them. Previously, anyone age 65 or over who sold his or her home did not have to pay any tax on the gain if the adjusted sales price of the house was \$20,000 or less.

The exclusion amount has now been increased so that you pay no tax on the gain from the sale if the adjusted sales price is \$35,000 or less. If the adjusted sales price is over \$35,000, the tax break is prorated.

Remember, the adjusted sales price of your home is the amount you receive after paying selling commissions and certain allowable fixing up expenses, such as painting part of the interior of your home.

### Assemble Records Early

Because of so many changes in the tax laws, it's important for taxpayers to begin gathering their records together now, the Internal Revenue Service said.

Since records are especially important for taxpayers who itemize, the IRS suggested that taxpayers locate all records pertaining to itemized deductions and sort them into categories as they appear on Schedule A of Form 1040. Records also can alert taxpayers to deductions or tax credits which they might have overlooked.

*Continued on next page*

### COMSAT General film receives award

COMSAT GENERAL's feature-length film "Via MARISAT" has received a national CINE Golden Eagle Award. The award, presented at recent awards ceremonies in Washington, makes the film eligible for entry in international film festivals.

The 15-minute, 16mm color film traces the history of maritime communications from the introduction of the wireless at the turn of the century to the present era of modern com-

munications via satellite between shore, ships at sea and offshore facilities. Included in the film are interviews with industry spokesmen explaining the use of MARISAT by their companies for high seas communications.

In the past six months the film has been distributed to organizations in more than 20 countries, to numerous shipping companies and offshore operators both in the United States and abroad, to governmental and educational institutions and to news outlets.

### CEA Christmas dance an outstanding success

Almost 400 CEA members and guests attended the 1977 Annual Labs and Plaza CEA Christmas Dinner Dance held at the Sheraton-Silver Spring Hotel in December.

The evening's festivities included pre-dinner refreshments in the Fiesta Room, dinner in the Maryland Room,

featuring Filet of Beef Wellington, and entertainment. Music was provided by the New Sensations. The highlight of the evening was the performance of the South Sea Islanders, an exotic dance troupe, during which representative dances of Hawaii, New Zealand, Samoa and Tahiti, in native costumes, were presented. According to Martin Kelinsky, CEA President, the program was an unqualified success.

### Russell appointed Director of Administration at Labs



Lyn Russell, formerly Manager, Staffing and Personnel Services at Headquarters, has returned to the Labs as Director of Administration. Prior to his Headquarters assignment, Russell had been Personnel Manager at the Labs.

In the newly-created position, Russell will be responsible to Labs Director B. I. Edelson for Labs interface with Personnel and for administrative and office services including work processing, technical publications and library services.

If any records appear to be missing, the IRS said, taxpayers still have time to look for them or to request copies of bills or statements from banks, hospitals, or other sources.

Taxpayers who sold capital assets during the year, such as stocks or real property, should locate records indicating the date and price of the purchase.

Some areas where the law has changed and where affected taxpayers will require records include moving expenses and sale of a residence by those age 65 or over.

Taxpayers with questions about how long to retain records or what types of records are necessary to substantiate deductions should check with their local IRS office.

### Completing Forms Easier

Taxpayers who complained last year about tax forms and tables will be glad to learn that Federal taxes will be simpler to figure this year,

according to the Internal Revenue Service.

Probably the biggest change for 1977 involves the new tax tables. Last year, you had to make several computations before going to the tax tables to find your tax. This year, those extra calculations will be eliminated for 96 percent of all taxpayers.

The new zero bracket amount (\$2,200 for singles and \$3,200 for married filing jointly), personal exemptions, and the general tax credit have all been built right into the tax tables. This means that after entering your adjusted gross income on your tax form, you can go straight to the tables to find your tax.

Those of you who itemize your deductions will be required to make one computation before you can go to the tax tables. You will have to subtract from your income the amount by which your itemized deductions exceed the zero bracket

amount. Persons whose income exceeds the tax table amounts and those with more exemptions than the number listed will be among those also required to make additional calculations.

One thing to keep in mind with the new zero bracket amount is that it's a flat amount as opposed to the old percentage method. This change will result in lower taxes for most people.

Because several computations have been eliminated, tax forms will be simpler to prepare this year. A minimum number of entries will be required on Form 1040A before you go to the tax tables. And if the taxpayer requests, the IRS will compute his or her tax. The tax instructions contain details.

Form 1040A will be a single sheet printed only on one side, instead of the old half-sheet printed on both sides. The type will be larger, making the form easier to read.

## Network Bits

### Field Correspondents

#### Andover

*Joanne Witas*

#### Brewster

*Dorothy Buckingham*

#### Cayey

*John Gonzalez*

#### Etam

*Bev Conner*

#### Jamesburg

*C.B. Marshall*

#### Labs

*Norma Broughman*

*Joan Prince*

*Blaine Shatzer*

#### M & S Center

*Darleen Jones*

#### New York

*Stephen Keller*

#### Paumalu

*Bob Kumasaka*

#### Plaza

*Gloria Lipfert*

#### Santa Paula

*Pat Hogan*

#### Southbury

*Eileen Jacobsen*

*Editor's note. Without the effort of the Field Correspondent, it would be next to impossible to keep informed on happenings throughout the Corporation. We would like to take the opportunity in this issue to recognize those who regularly provide Pathways with news about their stations and activities.*

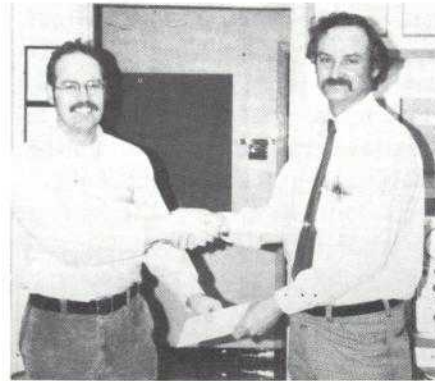
**ANDOVER.** Andrea Conner, wife of Senior Technician Jack Conner, was Chairperson for the COMSAT WIVES booth at the Annual Rumford Community Hospital Fair. Through the efforts of the volunteers a check for



*Andover Correspondent  
Joanne Witas*

more than \$20,000 was presented to the Hospital Auxiliary.

Safety Awards were presented by Shaun Arness to Dan Grenier, Senior Technician (at left in first photo), and Al Briggs, Senior Mechanic (at left in second photo), for their award-winning suggestions.



Jack Conner and Ralph Summerton finished in ninth position (U.S.) in the multi-operator, single transmitter category of the CQ World Wide Single Sideband DX Contest while operating from Station WA1VCV (for this operation, located in Ralph's basement).

Late one Sunday evening, early in January, the rains came and kept right on coming through Monday. Our area got four inches of rain and the temperature rose into the low 50s. Snow melted, roads washed out and home-owners were busy with buckets bailing out their cellars. Route 108, the major road between Rumford and the Lewiston-Auburn area, was ice-jammed until late Wednesday evening. The "Notch" road between Rumford and Andover was flooded in spots due to streams overflowing their banks.

There was no rail service into Rumford and the Boise-Cascade Paper Group, which produces almost 1,000 tons of paper daily, was stock-piling paper and their supply of raw material was running low. Train service was resumed Thursday morning along with normal operations. At the time of this writing (mid-January), the situation was normal—freezing temperatures with plenty of ice and snow.

Our best wishes go to Senior Technician Phil Morales and family on his transfer to Headquarters. The CEAA Christmas Party was held at the Silvertone Restaurant in Rumford, featuring a smorgasbord. A Christmas luncheon, compliments of the CEAA, was also held on the station site (see photo below). Finger tip rolls of ham and chicken salad were served along with other delicacies. —Joanne Witas



**BREWSTER.** Our skiers are happy—we have snow. It's the first time in two years that the area ski slopes have been open for skiing.

Receiving 10-year awards during 1977 were Melvyn Tate, Donald Briggs, Dewey Martin, Harvey Andersen, Darold Browning, Pete Vaughn and Walter Cheeseman.

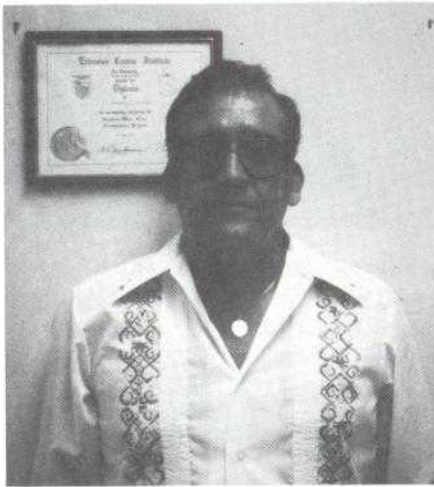
Facilities Supervisor Jim Harding retired and a retirement party was held at the Elk's Club in Omak for Jim and Maudie. William Reece came from Headquarters to fill the position. Bill and wife Tula are making their home in Malott. Robert Sanderson, Station Engineer, and Cheryl Stone were married recently



*Brewster Correspondent  
Dorothy Buckingham*

and purchased a home in Pateros. **William Glandon** has joined the station staff as Utilityman. He and his family moved to the area from Arlington, Washington.

—Dorothy Buckingham



*Cayey Correspondent  
John Gonzalez*

**CAYEY.** The big event here since the last issue of *Pathways* was the Employee Association's Christmas Party



which was well-attended and included a "Puertorican kitchen," offering the traditional roasted pig with all the seasonal trimmings. As you can probably guess, the wives were very active in the preparation of the Christmas dinner. —**John J. Gonzalez**



**ETAM.** **Marvin Miller** was the only successful deer hunter this past season, bagging a six-point buck. The ECEA purchased Christmas gifts for all members' children under the age of 12. A chili and corn chip Christmas luncheon was sponsored by Nippon Electric employees at the site.



*Etam Correspondent  
Bev Conner*

**Bill Bell** is back at work after a leg operation. **Rupe Hobbs** has been discharged from the hospital in Parsons and should be back to work soon. **Phyllis Loughrie**, Advance Industrial Security Guard, left for Florida at a most opportune time, right before the heaviest snowfall of the season.

Etam CEA members elected **Mike O'Hara** Chairman for the 1978 term. Representatives chosen were: **John Formella**, **Paul Helfgott**, **Rupe Hobbs**

and **Bill Mayes** from COMSAT; **Bob DeNigris** of ITT; and **Fred Rockwood** of AT&T.

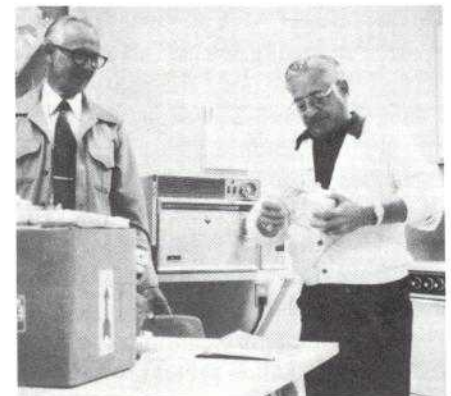
—Bev Conner



*Jamesburg Correspondent  
C. B. Marshall*

**JAMESBURG.** The big news this issue is the station's first retirement—**Warren Neu**, Station Administrator. **Warren** retired in November, completing almost 10 years of service with COMSAT. He was one of the "first hands on board" when Jamesburg went into operation and has seen the station through its many changes and all of its epochal participations: the '68 Olympics, the moon walks, President Nixon's trip to China, and other history-making events.

In the photo below, **Warren**, at right, receives congratulatory messages from the COMSAT staff and retirement gifts presented by Station Manager **John Scroggs**.



**Warren** participated in the trimming of the station's manning from a robust 41 persons to a lean, taut

team of 22. He has saved many dollars for COMSAT with his ability to cut through red tape and in procuring needed items on a timely basis. **Warren** will be missed here at Jamesburg. However, he and his wife **Thelma** will continue to reside in the Jamesburg area and will always be considered members of the Jamesburg team.

Taking over the helm as Administrator from **Warren** is **Wilfred S. Nubin**. "**Stan**" has been with Jamesburg since 1968 and has worked as an Electronic Technician, Maintenance Shop Repairman and as Shift Supervisor. **Stan** and his wife **Mammie** live in Carmel Valley Village and have a married daughter, **Cora**.



"Stan" Nubin

Recently joining our staff was **Peter S. Rasher**, formerly with the U.S. Military Service working in microwave systems. **Peter** and wife, **Kathy Norene**, have two sons, **Steven** and **Paul**. They live in Salinas.

—C. B. Marshall

**LABS.** **Jewel McCaa** is back at the Word Processing Center after an extended period of illness. **Wayne Chang** and **Nat Morell** have moved into their new homes in Gaithersburg. Our thanks to **Rosa Liu** and **Ann Speare** for hosting the annual Christmas party. **Terry Lowe** and wife **Carol** are the proud parents of twin boys, **Brendon** and **Bradley**.

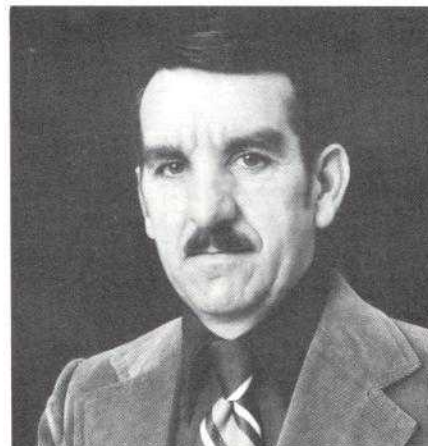
At the time this column was submitted **Bill Holloway** and wife were anticipating a new addition to the family. **Paulette Luper** entered the hospital for surgery. **JoAnn Wagner** has recovered from minor surgery.



Labs Correspondent  
Norma Broughman



Labs Correspondent  
Joan Prince



Labs Correspondent  
Blaine Shatzer

**Edith Ford** has a 10-pound grandson, born to Kirby and Judy Brant. **Karen Crook** and children spent Christmas visiting her father in Florida. **Hien Nguyen** is in his new townhouse in Germantown.

In the last issue we reported that **INTELSAT** Nominee **Kevin Hodson** and wife were expecting an addition to their family. We can now report that the Hodsons have a son, **Thomas Edward**. Kevin flew to England to bring his family back to the states. **Mark Wilson** attended a Digital Troubleshooting seminar in Michigan. **Ralph Burall** recently underwent a tonsillectomy.

Labs Director **Edelson** presented **Ed Wright** with the Honorary Member-COMSAT Laboratories Award "in recognition of his excellent technical, management and administrative contributions and his friendly and constructive spirit for a decade of assistance and support." (Photo Below).



Patent Incentive Awards were given to **F. Assal, A. Atia, A. Ber- man, W. Childs, J. Dunlop, O. Horna, C. Mahle, A. Meulenberg, D. Perlmutter, A. Ramos, R. Rid- ings, P. Schrantz, R. Stegens, J. Stockel, G. Van Ommering, G. Welti** and **A. Williams**.

Receiving ten-year awards were **P. Avruch, S. Chou, R. Cooperman, B. Edelson, H. Fliieger, A. Ramos, J. Rubin** and **A. Standing**. Five-year-award recipients included **R. Bowen, J. Carter, C. Harp, G. Van Ommering** and **P. Ackerman**. Safety awards were presented to **C. Harp** and **R. Wathen**.

Labs transfers include **W. Surber** and **C. Daganhardt**; **D. Lehman, K. Natarajan, B. Reader, J. Steinhorn** and **R. Edy** are among the departures; while the new faces seen around the Labs are **W. Bruce, M. Redman, P. Karmel, V. Christiansen,**



A. Goldstein, H. Morens, L. Veenstra, S. Taylor, L. Lee and F. Lee.

Nurse **Betty Mowen** accepted the Red Cross Certificate of Appreciation from **Dr. Edelson** (photo below). The



certificate cited the Labs "for outstanding cooperation with the Red Cross Blood Program." Among Labs blood donors were **P. Ackerman, J. Creamer, B. Free, W. Gaunt, M. Ginsberg, M. Hutchens, G. Hyde, K. Pease, J. Rubin, P. Schrantz** and **K. Updike**. —B.P.S.

**M & S CENTER.** Our annual Christmas Party, hosted by the **George Robertsons**, featured a "pot luck" dinner and was well attended. The **Vito Visaggios** have moved into their new home in Montgomery Village in Gaithersburg.



*M&S Correspondent*  
**Darleen Jones**

**Lee** and **Angus Bolinger** announced the forthcoming June marriage of their daughter **Janice** to **Mike Yuzzo**. **Jim** and **Jean Silvius** had a full house

for the holidays. Son **Tim**, who completed basic Navy training and is reporting to San Diego, spent the holiday at home together with brother **Dennis**, a member of Washington's "Old Guards," and sister **Beth**, a senior at Western Maryland.

Calibration Team members **Don Rounsaville** and **Charles Andersen** have departed for Cayey, Puerto Rico, and Managua, Nicaragua. Holiday vacationers included **Erma** and **Bud Kennedy** to Orlando; **Betty** and **Turk Hall** to West Virginia; and **Pat** and **Bill Ross** who spent their vacation at home entertaining family members and relatives from Florida, New Jersey and Virginia.

—Darleen Jones



*New York Correspondent*  
**Stephen Keller**

**NEW YORK.** 1977 was a year of business expansion for COMSAT GENERAL's office in the center of the maritime industry. Our proximity to the earth station at Southbury enabled us to conduct visits to the station by seagoing and shoreside representatives of the shipping industry and to arrange visits by the station staff to MARISAT-equipped vessels such as the *Lash Turkiye*, *Queen Elizabeth 2*, and *Rotterdam*. Hardly a week goes by that a MARISAT-equipped vessel does not call at the Port of New York. This presents us with opportunities to bring prospective customers aboard to see MARISAT in action.

In April, **Ed Dooley** and **Steve Keller** demonstrated our services at the Navigation Aid and Communications Conference in New York, where Charles Dorian of our Headquarters office was a speaker. Following a MARISAT installation aboard the Greek passenger vessel, *Navarino*, **Steve Keller** and **Mary Ward** joined our Chairman, **John Johnson**, and **Dave King**, Manager of International Sales, at a press conference at the Karageorgis office in New York. At the same time, **Ed Dooley** was in Brazil, assisting with our exhibit at RIOMAR.

Major MARISAT commitments during 1977 included fleet-wide installations by Seatrain Lines, Inc. and the Liquified natural gas (LNG) tankers of the Energy Transportation Corporation and the El Paso Natural Gas Company. The passenger ship *Rotterdam* and the hotel ship *Margarita L* were also equipped, following signing of contracts in New York.

One of the advantages of our location is our view of the Rockefeller Center Christmas Tree, which was lighted on December 5 with nationwide television coverage. The trees have ranged in height from 55 to 90 feet, and in weight from three to ten tons, with the lights using six miles of wiring.

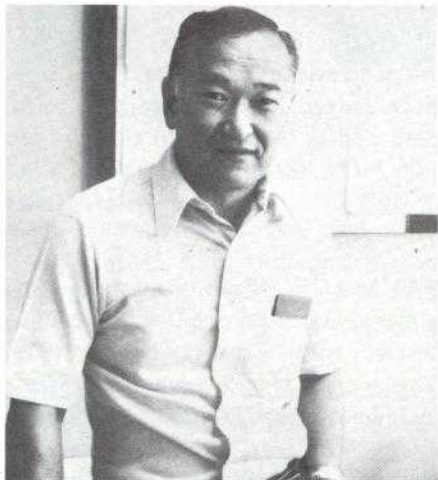
—Steve Keller

**PAUMALU.** Five Paumalu employees will be completing 10 years of service with COMSAT during 1978. This year's service award recipients include: Senior Technicians **Paul A. Koike**, **William D. Osborn**, and **Kent Hunter**; Operations Supervisor **Richard I. Senones**; and **Glenn M. Vinquist**, Station Manager. By year-end 1978, 25 of the 35 full-time employees at the station will have completed 10 or more years of service with COMSAT. Represented in this group are 11 who were with the original contingent when Paumalu began operations in 1966.

All station members and their families enjoyed a safe and healthy holiday season. While people in many

parts of the country experienced extremely cold weather during the holiday season just past, Hawaii residents were blessed with unseasonably warm weather. With station activity at a minimum during the year-end period, many employees spent the holidays on vacation.

The new year brought with it a flurry of activities on station. **Bela Banyasz's** arrival with a Navy representative in early January to inspect and perform an operational readiness checkout of the MARISAT terminal signalled an increase of activities. Senior Technician **Tom Ota** of the Electronics Maintenance Shop provided assistance to the COMSAT GENERAL project. Next to arrive was the seven-member, In-Orbit Test Team led by **John Melville**, to perform post-launch acceptance tests of the INTELSAT IV-A (F-3) spacecraft. Assistance was provided by various station personnel during the team's three-week stay. **Ken Yamashita**, Station Engineer, coordinated the support provided by station personnel.



*Paumalu Correspondent  
Bob Kumasaka*

During the latter stages of spacecraft testing, **Dan Difonzo** and **Warren Trachtman** of the Labs arrived on site to conduct the cross polarization experiment on the new spacecraft. In the midst of these activities, **Don Fifield**, Director, U.S. Facilities, made his familiarization visit to Paumalu. Late in January, 70 students from a nearby school paid a

visit to the station. And so the tranquil scene, which prevailed at the station during most of the year-end period, came to an abrupt halt, which could portend a busy year ahead for the Paumalu station.

Senior Technician **Leslie M. Goya**, on temporary assignment to SBS, returned home for the holidays to spend time with his family and friends, but most of all to enjoy the Hawaiian sunshine. The frigid weather conditions in the areas he has been assigned during the past weeks has not dampened his enthusiasm about the SBS project. **Les** is scheduled to return to Paumalu in early March.

**Tim Kolb**, Senior Technician in our TTC&M Station, is one of five Amateur Radio Club enthusiasts at Paumalu. **Tim** was recently re-elected to his seventh term as a member of the Board of Directors of the Emergency Amateur Radio Club of Honolulu. This club provides additional communications support to the State Civil Defense Agency during any natural disaster. **Tim's** interest in amateur radio dates back to 1961 when he got his first license. Other Paumalu station employees who are amateur radio enthusiasts include **Jack Vollrath**, **Don Stribling**, **Rick Senones**, and **Norman Murakami**.

—**Bob Kumasaka**

**PLAZA.** Five new directors were elected to the CEA Board, joining the four members who have one year remaining to serve. The new members, whose terms of office will expire March 31, 1980, are **Ann Younger** and **Ernst Steinbrecher** of the Plaza, and **Anne Speare**, **Charles Barrett** and **George Huson** of the Labs.

**Betty Glazer** reports that she and her husband spent a very enjoyable four months in Jerusalem as guests of the Hebrew University. **Betty's** husband, a faculty member at American University, was in Israel to do research on trade relations between Israel and Japan.

COMSAT gained a winner with **Ethel Saltz's** return to the Corporation to work for **Al Yenyu**. However,



*Plaza Correspondent  
Gloria Lipfert*

**Elizabeth Martin** left us to go with her husband to his new assignment in Philadelphia.

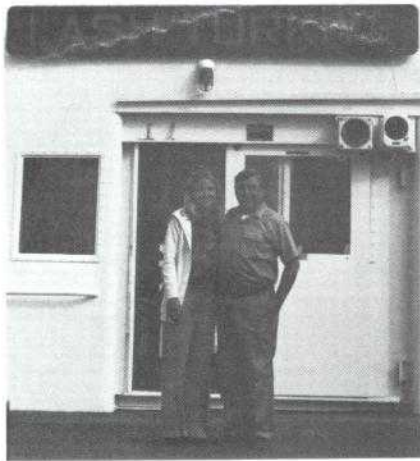
Since 1971, the employees of the Accounting Department have elected to contribute to the Children's Hospital in lieu of exchanging Christmas cards. This year we were pleased to have the employees of the Auditing and Administrative Systems join with us in this worthy cause. As the result, we broke the record of previous years, collecting \$186. A check was sent to **Hardin and Weaver** of Radio Station WMAL and appropriate recognition was given our donation early in January.

—**Gloria Lipfert**

**SOUTHBURY.** Christmas was quite an event at Southbury for the MARISAT Operators. They received a beautiful floral Christmas bouquet and chocolates from the Tuna Fleet



*Southbury Correspondent  
Eileen Jacobsen*



*MARISAT Operator Cindy Bachrycz and Captain H. C. Parker aboard the Presidential Line's Lash Turkiye in New York.*

Management representing the ships *King Oscar*, *Granada*, *Portobello* and *Chiriqui*. The Operators also individually received bouquets of red carnations and boxes of candy from the ship *Al Hasa*, a hotel ship, situated off the coast of Saudi Arabia.

Your correspondent wants to thank the Headquarters CEA for making smoke detectors available. One morning around 2 a.m., ours at home went off to awaken the family and we discovered the entire downstairs filled with smoke. A woodburning stove had ignited the wood stacked near it. Because of the immediate alarm no damage was done. The smoke was vented and the family was back asleep shortly thereafter. (The woodpile has been moved away from the stove and another smoke alarm purchased for downstairs.)

**Scott Ackland**, Communications Technician, recently enjoyed a vacation in Michigan visiting the Henry Ford Museum and many of his friends living there. **Per Bigseth**, Research Engineer, Standard Telephone and Cable (STK), Oslo, Norway, visited the station for a tour and discussions of design criteria for the Norwegian MARISAT Shore Station. **J. V. Friel**, former Director of Personnel for COMSAT, and now a resident in neighboring Newtown, Connecticut, visited the station. He is

The Southbury Earth Station received holiday greetings from King Hussein I from his ship *Swordfish*. The following is the message as it was received.

To our good friends with MARISAT from Jordan the Holy Land

To Annabelle, Cindy and Connie,  
To Dolores and Rosemarie too,  
To all our friends with MARISAT  
Our Christmas wish to you.

May God Bless you and everyone  
Who is close and dear to you,  
With everlasting happiness  
May all your dreams come true.

May peace and true contentment  
Be there for all to share,  
And may the sun shine warmly  
And may the winds be fair,  
And may the stars shine brightly  
For all to sail in harmony  
Through all of a good New Year.

"With our deepest appreciation for your thoughtful message and your many kindnesses, and in friendship—"

Signed *Hussein I*

"And on behalf of your many friends in Jordan—"

*Swordfish*



*Radio Officer Reiner Fritsch of the hotel ship Al Hasa visited the Southbury station recently and was guest of honor at a dinner sponsored by the MARISAT Operators. Shown in the above photo, from left to right, are Annabelle Lyle, Rose Marie Eureka, Radio Officer Fritsch, Cindy Bachrycz, Dolores Raneri and Connie Sarles.*

retired from the Corporation and contributing his talents and expertise to Western Connecticut State College in Danbury. —Eileen Jacobsen

### Labs Sickel expires

John Sickel, Experimental Machinist at the Labs, died on Christmas Day. He had been employed at the Labs since May 1968. Funeral services were held at the Bethel Lutheran Church in Manassas, Virginia, with burial near Philadelphia, Pennsylvania.

### Service awards

The following COMSAT and COMSAT GENERAL employees have celebrated service anniversaries during the months of January and February.

Completing 10 years service were **Matthew P. Cobert**, **Willie J. Davis**, **Gordon L. Johnson**, **Joseph A. Kearns**, **Carmen L. Vazquez**, **Jack L. Dicks**, **Dixie D. Joye**, **Henry E. Carlson**, **Clarence B. Crane**, **Eugene P. McCarthy**, **Robert A. Dahlgren**, **Alice D. Bullie**, **Sookhi (Suzy) Ro**, **Leonard E. Bonneau**, **Martin W. Earl**, **Jimmie L. Payne**, **Roderick W. White**, **David L. White**, **Lidia C. Oliva**, **Andrew Meulenberg**, **Henry B. Williams**, **Lee A. Terry**, **Edward R. Slack**, **Barbara Swaylick**, and **Lawrence J. O'Hara**.

Completing five years service were **Joseph A. Jankowski, Jr.**, **James A. Castellan**, **Chris V. Simpson**, **William J. Hixon**, **John L. Talbot, Jr.**, and **H. Anne Speare**.



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For more information, write for a copy of our anniversary booklet, COMSAT AT 15.

**COMSAT**

COMMUNICATIONS SATELLITE CORPORATION  
COMSAT GENERAL CORPORATION

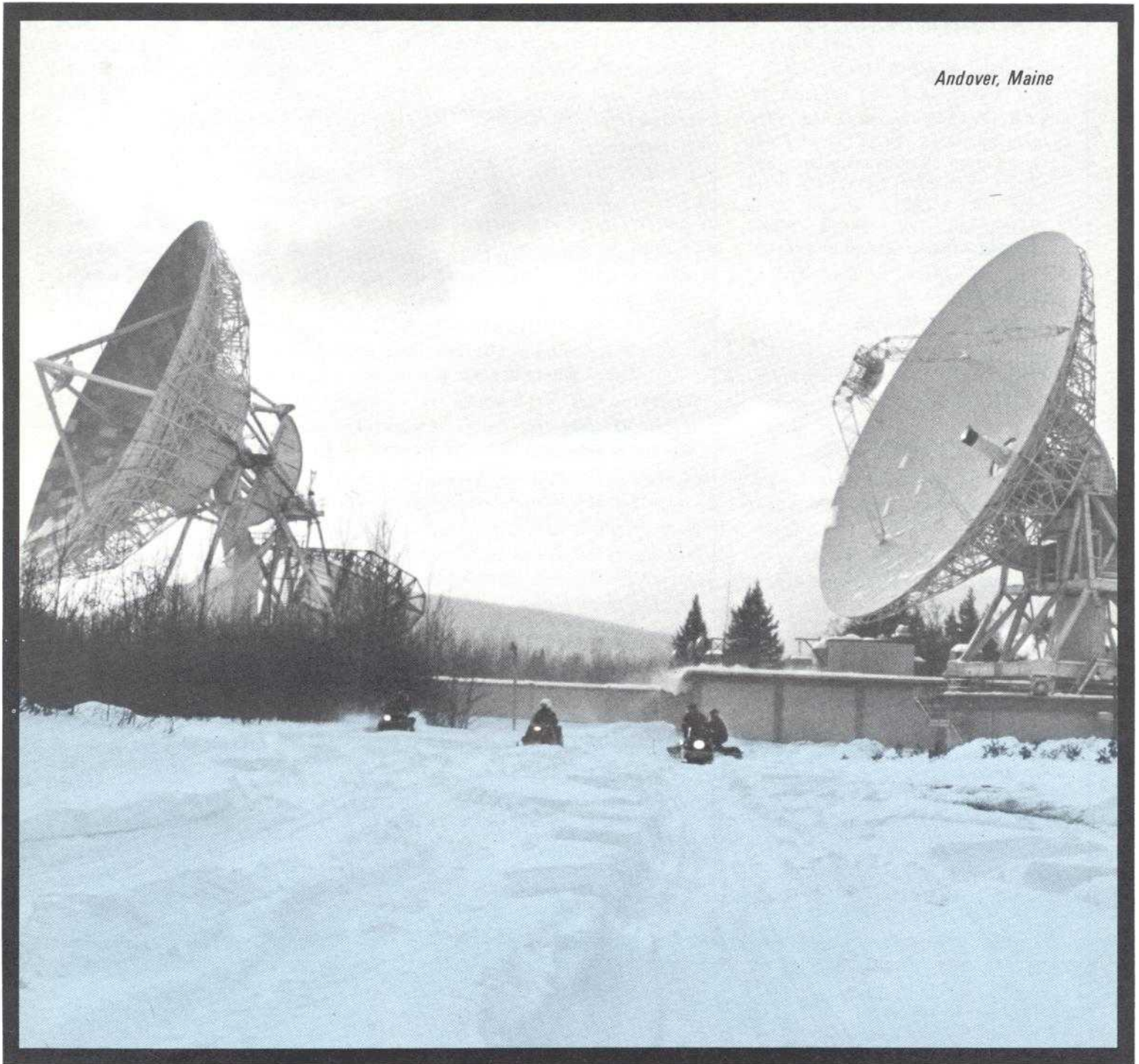
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# Pathways

SATELLITE

March-April 1978  
Volume 3 Number 2

*Andover, Maine*



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Cover Photo By J. T. McKenna

## an impressive record of communications pioneering in space

**T**HE EARTH STATION complex at Andover occupies a unique position in the development of modern satellite communications.

From this wooded site in western Maine, the first full-time commercial communications satellite pathway was established between North America and Europe on June 28, 1965. Since then, Andover has been modified to operate with four successively advanced generations of satellites, the latest being the new INTELSAT IV-A series.

Well before the commercial era, however, the Andover station had accumulated an impressive record of communications pioneering in space through its original "horn" antenna. It was built by American Telephone and Telegraph Company (AT&T) in 1962 for experimental purposes. Dramatic successes were achieved with Bell System's TELSTAR satellites in 1962 and 1963, including the first transatlantic TV transmission between Andover and stations in England and France. The Andover facility was

also used in experiments with the RELAY and SYNCOM satellites, the latter a direct predecessor of Early Bird (INTELSAT 1), the world's first commercial communications satellite. The Andover station was purchased by COMSAT from AT&T in August 1965.

Today the Andover station, with its two giant dish antennas, is a key facility in the worldwide network of earth stations which, at the end of 1977, was composed of some 200 antennas at 160-plus station sites in nearly 90 countries operating with the INTELSAT system of satellites positioned over the Atlantic, Pacific and Indian Oceans.

In addition to the international communications services it provides, the Andover station also serves as one of six international satellite control centers.

The earth station complex at Andover is located in Oxford County, about 90 miles northwest of Portland. The site is located in a quiet "radio valley" which provides natural shielding from many sources of radio

# The Andover Chronology

interference. A second east coast earth station complex is located at Etam, West Virginia, about 40 miles southeast of Morgantown.

The second antennas, constructed at Andover and Etam in 1975, provide each station with great flexibility in operations with the Atlantic region and INTELSAT IV-A satellites. Andover and Etam also provide backup for each other in the event of a major outage at either station.

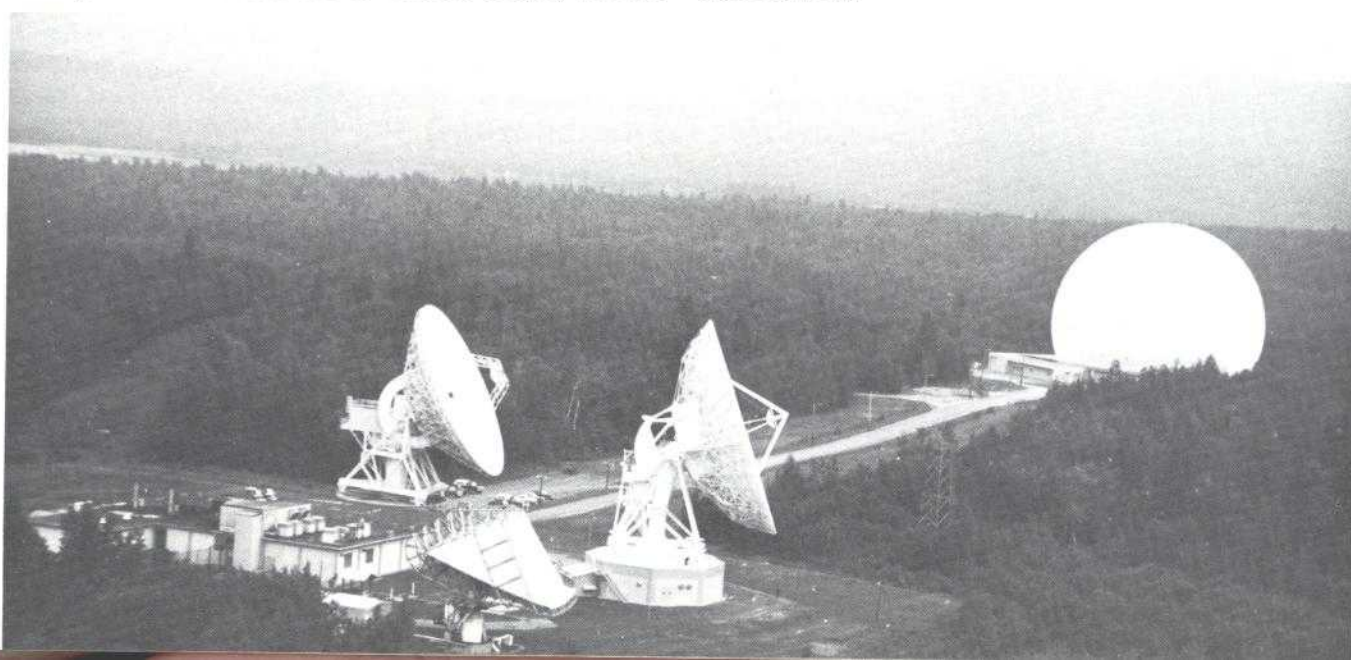
The Andover station serves as a U.S. doorway to the INTELSAT system. It has the capability of linking the United States directly with many countries in Latin America, Europe, Africa and the Middle East. All forms of commercial overseas communications, including thousands of high-quality telephone calls, teletypewriter messages, pictures, high-speed data and television programs are processed through the station.

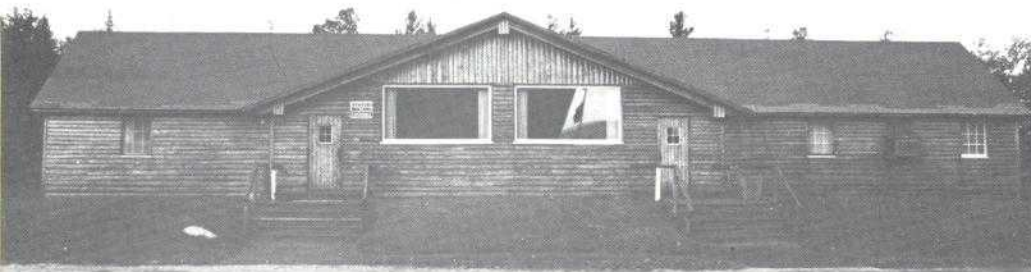
Extensive modifications have been made at Andover to update the sta-

*(Continued on next page)*

*The Earth Station at Andover, Maine. In the background is the radome-covered original "horn" antenna. It was from this wooded site in western Maine, that the*

*first full-time commercial communications satellite pathway was established between North America and Europe on June 28, 1965.*





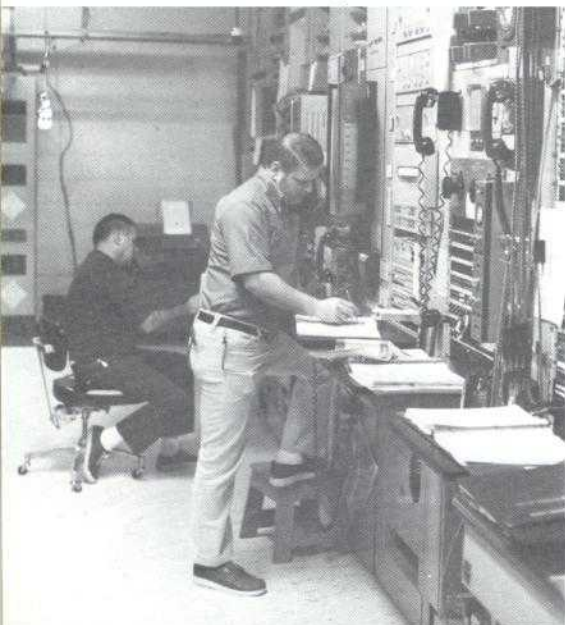
*The Visitors' Center at the Andover Station provides a history of the station and the Intelsat system. In 1977 it accommodated approximately 15,000 visitors.*

## Early New England character carried over into 20th century Andover

tion and equip it to perform its demanding commercial tasks with reliability, 24 hours a day. The latest innovation is the new antenna capable of working with the family of INTELSAT IV-A satellites which introduce a new concept in satellite communications, frequency reuse through beam separation. This technique permits the same frequency to be used twice, thereby substantially increasing the capacity of the satellite.

Adjacent to the control building are the two dish-shaped antennas which stand taller than 10-story buildings. Despite their massive dimensions, the entire structures can be rotated in azimuth and elevation

*The station Control Building houses a maze of sophisticated equipment for centralized operation of the station. Here skilled technicians test and monitor performance of the station, control the antennas and coordinate operations with other stations in the Atlantic Ocean Region.*



to keep them accurately pointed at a satellite with a precision measured in thousandths of a degree.

Communications are transmitted and received at the same time through each of the antennas at microwave frequencies. Signals are transmitted to the satellite in the six gigahertz band (six billion cycles per second), and received in the four gigahertz band.

COMSAT shares ownership of the Andover earth station with other U.S. international carriers. In an interim ruling in 1966, the Federal Communications Commission set the following ownership quotas for the Andover station: COMSAT, 50 percent; American Telephone and Telegraph Company, 28.5 percent; RCA Global Communications, Inc., 10.5 percent; ITT World Communications Inc., seven percent and Western Union International, Inc., four percent.

The Andover complex is actually a "two-station" facility. Adjacent to the control building is a transportable earth station equipped with a 42-foot "sugar scoop" antenna which was installed in 1966. This facility is used to perform specialized duties associated with the launching, positioning and performance monitoring of the satellites. The Andover site is but one of six such facilities spaced around the globe to provide satellite tracking, telemetry, command and monitoring (TTC&M) services. The other facilities are located at Tangua,

*(Continued on page 22)*

**Editor's Note.** *This is the fifth in the series of feature stories on COMSAT and COMSAT General's Earth Stations. Prior issues of PATHWAYS contain features on earth stations at Brewster, Washington; Etam, West Virginia; Jamesburg, California; and Southbury, Connecticut. Future issues will carry similar stories on the earth stations at Paumalu, Hawaii, and Santa Paula, California. Those interested in obtaining copies of the foregoing features should write to the Editor of PATHWAYS.*

*We express our appreciation to Oxford County Commissioner Stuart F. Martin for his review of the material and suggestions. Mr. Martin is a descendant of one of Rumford's original proprietors. Born in 1907 he has served on the School Board and City Council, as County Treasurer and Mexico Town Manager, and is presently a County Commissioner. In business life he is a Real Estate Broker-Auctioneer. Mr. Martin's hobby is local history and genealogy. He is President of the Rumford Historical Society and is completing a book entitled New Pennacook Folks to be published soon.*



## STORY AND PHOTOGRAPHY

BY JOHN J. PETERSON

**O**XFORD COUNTY, the site of COMSAT's Andover Earth Station, lies almost at the north-easterly tip of the United States. Its western perimeter forms most of the boundary between the State of Maine and that of New Hampshire, its neighbor. To its north, the county shares a border with the Canadian Province of Quebec.

Andover is situated within a dozen miles of the New Hampshire line while, less than an hour's drive to the north, paved roads end before reaching the Canadian border. Yet, not a hundred miles southeast of Andover lies Maine's largest city and one of the eastern seaboard's most attractive ports, Portland.

Andover traces its beginning back into the late 1700s. The following is extracted from an article entitled *History of Andover, Maine*, contained in the booklet *Heritage Days of Andover*, a souvenir publication printed by the Andover Bicentennial Committee in 1975.

One hundred and sixty-seven years ago a body of citizens, mostly of the parish of North Andover, Massachusetts, sent forth in 1787 two of their members to find for them a territory in which to establish themselves and

their families. The explorers, as they were to examine a vast wilderness, went on foot. On their way home through "Sudbury Canada," now Bethel, they met "Col." John York. He advised them, before making a final decision, to visit the lands now included in the town of Andover. Under the guidance of "Col." York, the explorers turned back and were so charmed with what they saw that they at once determined to recommend to their associates the purchase of the township which included such highly praised lands. A contract for the purchase of the township was made.

At a meeting of the proprietors, held September 4, 1788, it was voted to raise one pound sixteen shillings to each sixtieth part of the township, for the purpose of completing payment for the township; also have a committee to view the streams of the town in order to obtain the best site for a saw mill and a grist mill. At the same meeting, a committee was appointed to lay a road from New Penacook (now Rumford) as far as a clearing for a settlement in the town had been made. Most of the early settlers of Andover made their selection of lots, making clearings upon them, erecting buildings and moving to them, several years before they were confirmed to them by a vote of the proprietors.

The leading spirit in the enterprise was Ezekiel Merrill. Mr. Merrill and his family, with whatever could be provided for them, set sail in May in 1789, the fleet consisting of seven canoes, managed by Pequaket In-

dians. The fleet proceeded down the Androscoggin River to the mouth of the Ellis River, and then up this river to where the east and west branches meet, a spot famed for its beauty, and well known as "The Meeting of the Waters." Mr. Merrill and his family, among this band, moved up the river to the spot where the Merrill House now stands. They were thirty miles by water from any neighbors but Indians, and sixty miles from a meeting house, schoolhouse or a doctor. The Indians were quite numerous in and about Andover, were very friendly, and brought in great quantities of food.

Andover was incorporated as a town June 22, 1804, the article concludes. At the first town meeting, \$30 was voted to defray the annual expenses of the town, \$200 for the construction of roads and \$60 for the maintenance of schools. It was voted to allow sixpence per hour (less than 10¢) for work done on the roads.

Andover today is a town of approximately 700 people with a government of Selectmen which adheres to the Town Meeting concept so characteristic of the early New England political process. Its principal industry is wood products much of which is supplied to the Ethan Allen furniture chain. Timber cutting and logging provides employment for many of those in the area.

*(Continued on page 6)*

*Mr. Peterson is Editor  
Of Pathways.*

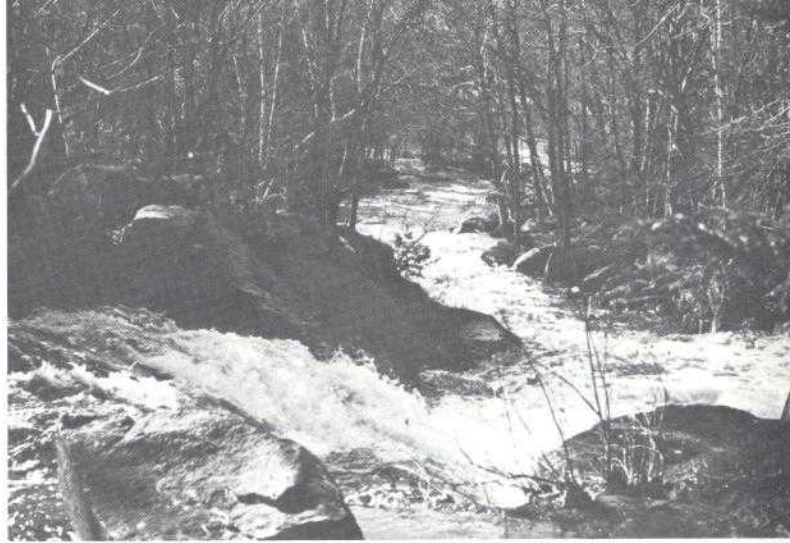
*Ken Dixon, Andover Operations Supervisor, in front of Andover's Town Hall, still used for conducting "Town Meetings" which, Ken admits, sometimes get "stormy." (Photo at left.)*

*The Post Office in Andover is typical of the thousands of small-town post offices serving the less-populated communities throughout the country. (Photo below.)*

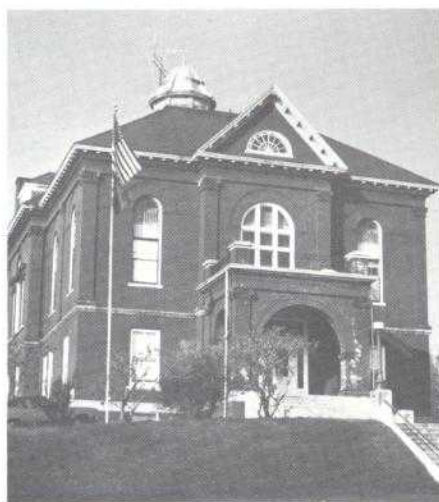




Covered bridges such as the Lovejoy Covered Bridge in Andover built in 1868 still abound in the New England countryside. The bridge spans the Ellis River.



The view of the Androscoggin River cascading through a gorge paralleling Route 120 adjacent to the Andover Station changes with the season but never loses any of its natural beauty.



Situated in westernmost Maine, almost twice the size of Rhode Island, Oxford County includes the Andover Station within its boundaries. Shown above is the county courthouse in South Paris.



The grave of Molly Ockett. Said to be the last of the Pequawket Indian Tribe, she was constantly in demand by settlers as a midwife. She is buried in the Andover Cemetery.

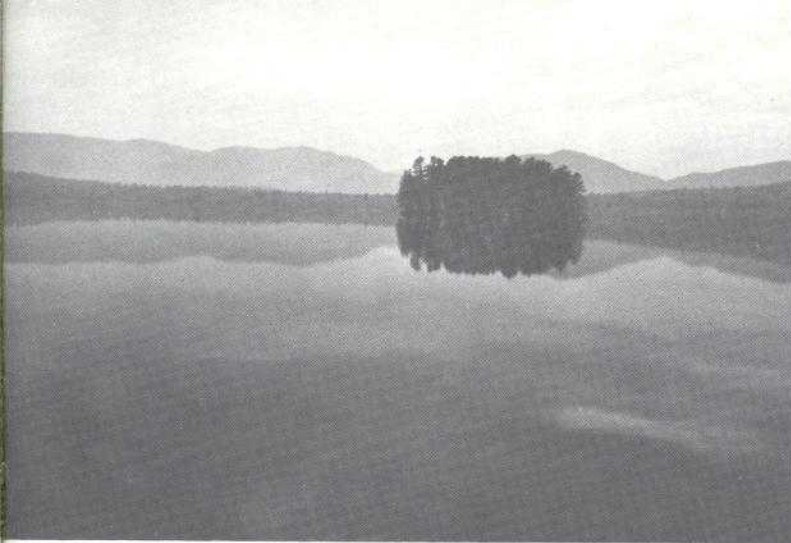


The Appalachian Trail enters Oxford County from New Hampshire, passing within five miles of Andover on its 279-mile course to Mount Katahdin, Maine's highest peak.

Paris, the County Seat, is divided into two major communities—South Paris and Paris Hill. Dominating Paris Hill is the birthplace of Hannibal Hamlin, Maine's twenty-third governor and Abraham Lincoln's first vice-president. It is considered one of Maine's most architecturally interesting and beautiful showplaces.

Hamlin Memorial Library in Courthouse Square on Paris Hill was, until 1895, the Oxford County Jail. Constructed in 1828 it still retains its original form with heavy iron door, grated windows and a solitary cell opened with a huge iron key, all lending credence to legends of early imprisonment and daring escape.

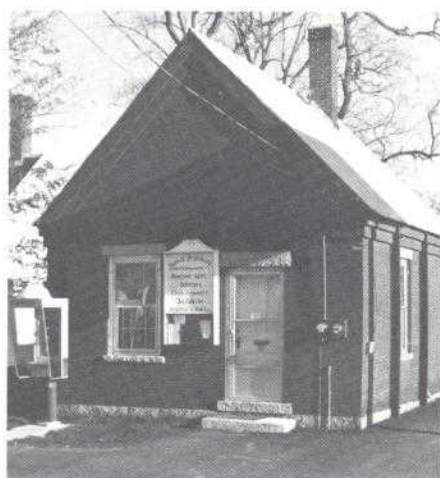




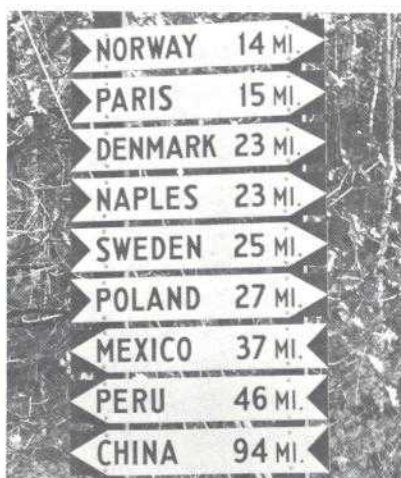
Deep in logging country a short drive east of Andover lies Ellis Pond, a recreation area which, even in the Fall of the year, presents a postcard view. It has a sandy beach and is noted for smallmouth bass fishing.



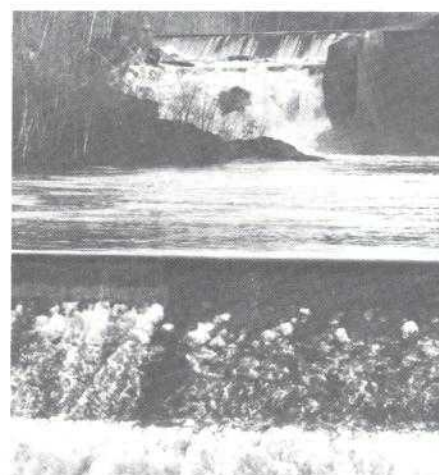
A half-hour's drive southeast of Andover is the Rumford-Mexico industrial complex. Dominating the industrial scene is the Boise Cascade paper mill, one of the largest of its kind in the world.



Government in New England doesn't seem to occupy too much space. The Municipal Building in Fryeburg houses the town's Selectmen, Clerk-Treasurer, Tax Collector and Registrar of Voters.

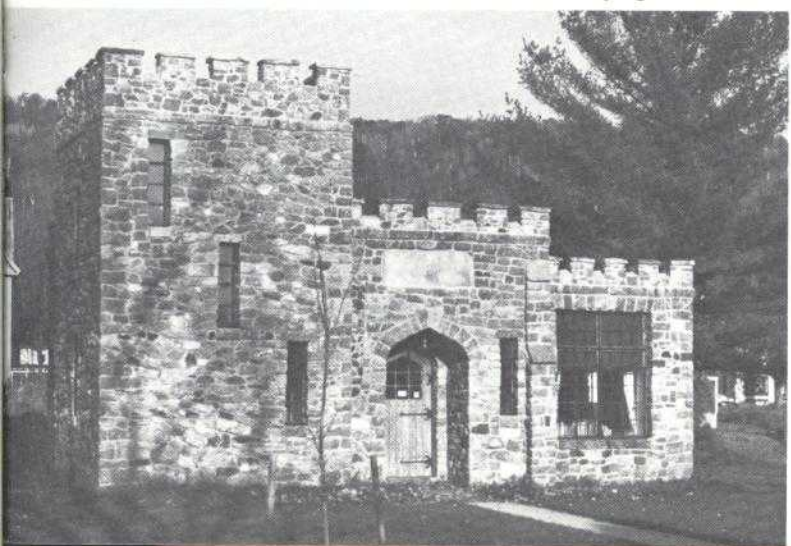


Lynchville, at the edge of the White Mountain National Forest, displays what is probably one of the most photographed landmarks in Maine, its "Believe-it-or-Not" Signpost.

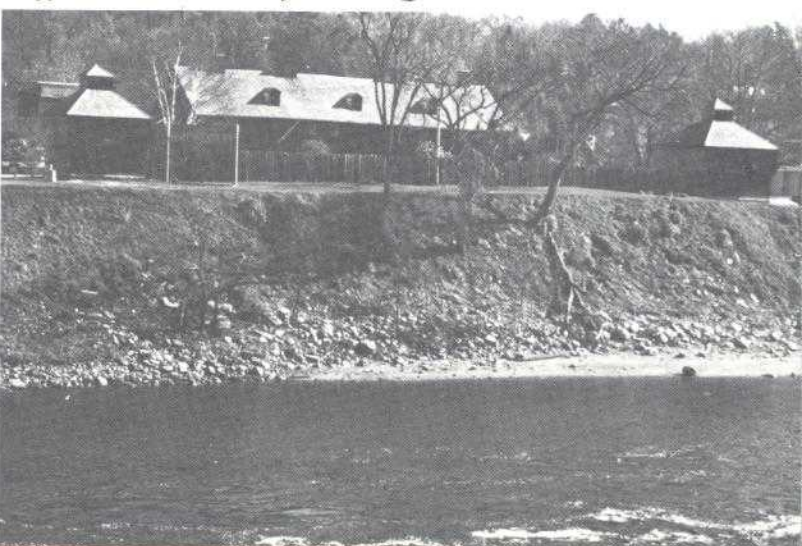


The Rumford Falls Power Company's generating plant (extreme right of photo) is dwarfed by the Androscoggin Falls which supplies the power for local industry.

The Village of West Paris sits among rolling hills. Its population of a little more than 1,000 residents includes many Finnish families. A point of interest is its one-room memorial library designed like a small castle. Local residents say it was built by a resident in honor of a brother who died at an early age.



Fort Western, on the banks of the Kennebec River in Maine's Capital of Augusta, was built in 1754. Although lying in adjoining Kennebec County, it is less than a two-hour drive from Andover to this historic spot where Benedict Arnold and his 1,100 men stopped in 1775 on their way to attack Quebec.



*(Continued from page 3)*

Elementary education is provided locally; high school students are bussed to nearby Bethel. Although law-enforcement is furnished by the county and state police, Andover does have a part-time deputy sheriff. A volunteer fire department serves the community. Approximately one-half of the station personnel live within the environs of Andover and participate in its activities.

Although "small town" in character, it is Andover's location that makes it an interesting and exciting "jumping off" place for the lover of nature, the outdoorsman and the history buff. Within easy reach of Andover lies the potential to satisfy the interests of each of the three.

For the nature lover there is the Appalachian Trail, a 2,000-mile-long footpath stretching from Georgia to Maine. The trail enters Maine from the White Mountains of New Hampshire through Oxford County and passes within a few miles of the Andover station in its course to its terminus at Mount Katahdin in Maine's Baxter State Park.

The outdoorsman or sportsman needs only to drive north for about 20 minutes to reach South Arm at the lower end of Richardson Lake. Here the surfaced road ends and further travel northward is by trail or boat. Deep in the woods on the south shore of Lower Richardson Lake, an extension of Mooselookmeguntic Lake, South Arm is the gateway to a wilderness of lakes, woods, streams and mountains, the annual favorite for thousands of fishermen, hunters and vacationers.

Just as historic sites abound throughout New England, so too are they in abundance in Oxford County and its neighboring counties. The student of history and the sightseer

pausing in Andover will find the grave of Mollocket (spelled in various ways depending on the source), "The Last of the Pequakets," in the town's cemetery and, within the town's limits, the Lovejoy Covered Bridge, built in 1868, spanning the Ellis River.

Generally paralleling the eastern perimeter of Oxford County lies the route taken by the Arnold Expedition on its march into Canada to attack Quebec. An hour's drive east of Paris, county seat of Oxford County, Fort Western sits on the edge of the Kennebec River where the river runs through Augusta, the Capital of Maine. It was from Fort Western that General Benedict Arnold and his force of 1,100 volunteers departed to follow the tempestuous Kennebec River into the highlands of Maine, then into Canada. The fort still stands and has been restored.

Grafton Notch State Park, west of Andover, is literally a scenic wonderland. There is direct access to the park from Andover for the hiker and camper using the Appalachian Trail which passes five miles west of Andover before entering New Hampshire by way of Grafton Notch. For the motorist the park has its beginning at Newry, approximately 20 miles southwest of Andover on Route 26, and continues for more than 20 miles to Upton, just inside the Maine State line. The drive offers spectacular views of Old Speck Mountain and Baldpate Mountain and scenic points such as Mother Walker Falls, Moose Cave and the famed Screw Auger Falls where the swirling waters of Bear River have worn holes up to 25 feet deep in the solid rock of the river bed.

Entering Oxford County from the southwest corner on Route 160 and

approaching Porter, the snow-capped peaks of the White Mountains in New Hampshire are visible. Once in Porter, and with the help of directions provided by the proprietor of a country store, the Old Town Meeting House dating back to 1818 and severely simplistic in design was located. Historians state that the church, formerly Bullock Church, "was initially constructed with no provision for heating as it was the old-time belief that the love of God shown in the fervor of the congregation was sufficient to raise the temperature to a comfortable point. . ."

Across the road from the Meeting House is the Old Town Pound, built in 1825, and still preserved in its original form; stone slabs, roofless and with a single entranceway. The Porter-Parsonfield Historical Society preserves these sites as well as the 100-year-old Parsonfield-Porter Covered Bridge.

Hiram, east of Porter, named for Hiram, King of Tyre, was settled in 1774 by General Peleg Wadsworth, grandfather of the poet Longfellow. His hilltop home, known today as "Wadsworth Hall," was the summer residence of Longfellow. A part of the house is retained in its original form. Descendants of the family occupy the rest.

Almost on the Maine-New Hampshire border is Fryeburg, Oxford County's oldest town. It lies in the Saco River Valley and has a population of approximately 2,000. Much of Maine's history can be found in Fryeburg. Settled in 1763, it was once the Indian village of Pequawket, the home of Nescambiou, the only Indian knighted by France. (The Indian name Pequawket has variations of spelling depending on the source.)

The old Registry of Deeds building  
*(Continued on page 20)*

# Project Prelude: an experiment in user-to-user satellite communications

by ROBERT S. JONES

A communications consultant was presented with three potential problems:

- Several regional vice presidents urgently needed to meet together with top corporate officials, but they didn't have the time to travel to a central location. What could they do?

- A distantly located division needed, as soon as possible, copies of certain documents held at the home office some 1,800 miles away and couldn't wait for ordinary mail service. How could the papers be obtained?

- A production manager required immediate access to information available only in a central data bank. How could he rapidly lay his hands on this data?

The consultant's solutions to these requirements today may not be easy or even possible. But in the 1980's problems such as these will be solved by innovative communications systems using intracompany satellite networks.

To reach that point, however, certain barriers must be overcome—new and compatible business and high-speed communications equipment must be developed and produced, techniques must be formulated and refined, and certain areas of technology must be tested and perfected.

While it is widely accepted that communications satellite technology promises important new benefits for communications users, the availability of the requisite satellite technology does not by itself result in improved communications being available in the 1980's to the end user. Certain questions must be asked:

What new communications applications are emerging to benefit both private and government users?

How do user organizations become aware of the possibilities these applications will offer?

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*Mr. Jones is a Special Assistant in the Public Affairs Office at SBS.*

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*A Project Prelude session takes place at the Executive Offices of Texaco, Inc., in Harrison, N.Y. The teleconference, involving SBS presenters and "players," linked by CTS satellite, was held between Texaco facilities at Harrison and Bellaire, Texas.*

What steps should users take to prepare their organizations to accept and apply the emerging concepts?

What requirements will users place on manufacturers for advanced business and communications equipment?

How can the need for new and developing technology, techniques and equipment be identified?

To explore these areas and others a unique experiment, PROJECT PRELUDE, was initiated and coordinated by Satellite Business Systems (SBS) in conjunction with COMSAT Laboratories.

SBS, a partnership of wholly owned subsidiaries of Aetna Life & Casualty, IBM and COMSAT GENERAL, recognized the potential of combining the capabilities of a satellite already in orbit with the availability and suitability of existing business and communications equipment.

The satellite was the Communications Technology Satellite (CTS) which had been placed in geosynchronous orbit as a joint project of the National Aeronautics and Space Administration (NASA) and the Canadian Government's Department of Communications. The objective of

the CTS program, as stated by NASA, was to advance the technology of both spacecraft-mounted and related ground-based components and systems applicable to higher power satellites in the 14/12 gigahertz (GHz) frequency bands. To achieve this objective, the CTS program was designed to demonstrate new technology applications and to conduct experiments on components and systems that would be applicable to future commercial communications satellites.

PROJECT PRELUDE, initially designed for a three-month period commencing in November 1977, was enthusiastically received by observers and participants numbering more than one thousand.

The idea for PROJECT PRELUDE was born some 18 months ago in SBS discussions with COMSAT Labs. It was to be a satellite communications experiment in transmission of voice, high-speed data, facsimile and teleconferencing directly between user premises.

PROJECT PRELUDE goals were defined as:

*(Continued on next page)*



*Project Prelude earth station sits in a snow-covered parking lot adjacent to Montgomery Ward Corporate Headquarters in Chicago during the experiment earlier this year.*

*(Continued from page 7)*

- Testing and evaluating satellite communications and manufacturers' equipment by assembling them together for the first time.

- Laying the groundwork for the development of new advances in high-speed, reliable and high-quality equipment for future communications systems.

- Identifying user requirements which would contribute to the efforts of manufacturers developing and producing the required equipment.

- Increasing user awareness of the communications applications that can be offered by new technology.

- Assessing the new applications and new opportunities for cost savings and increased operating efficiencies that satellite applications promise for the user community.

The main thrust of PROJECT PRELUDE, therefore, was to focus awareness of both the user level—the organizations which may benefit from the new technology—and the vendor community—the manufacturers upon whom much will depend as they provide new and innovative business equipment, particularly in the communications field.

Early in 1977 SBS, in coordination with COMSAT Labs, approached NASA with a proposal to utilize the CTS for an intracompany business experiment that would attempt to

evaluate the usefulness of satellite communications for direct user-to-user communications. A formal proposal for such an experiment was submitted to NASA after agreement was reached for COMSAT Labs to build two transportable earth stations which could be placed on the premises of various company locations around the country. Additionally, authorization was sought from the Federal Communications Commission (FCC) for the earth station operations.

In February 1977, formal NASA approval was granted for PROJECT PRELUDE. Fabrication of the earth stations began at COMSAT Labs and SBS began approaching manufacturers who expressed an interest in testing their equipment and concepts and in evaluating user requirements for communications services in the 1980's. Commitments were obtained from various business equipment manufacturers to supply computers, audio, video, facsimile and related equipment to be used.

Advent Corporation offered large-screen, color television projectors; Arvin/Echo television freeze-frame storage equipment; Dacom/Rapifax furnished high-speed, high-resolutions facsimile equipment and Harris Corporation high-speed, any data rate modems. The computer systems data processing network came from Hewlett-Packard; color television cameras from Ikegami Electronics (USA), Inc., and NEC America, Inc. provided the color freeze-frame picture transmission system.

User—or host—companies were sought for the sites upon which to

locate the transportable earth stations and to take part as participants. Prerequisites were that the companies have significant intracompany communications requirements which were geographically dispersed, and that they represent a cross-section of the user community, thus assuring that representative data would be collected.

Three companies meeting these requirements joined PROJECT PRELUDE and offered corporate facilities between which satellite communications could be established.

Rockwell International Corporation would use its sites in Pittsburgh, Pennsylvania, and Seal Beach, California; Texaco Inc., would link its Executive Offices in Harrison, New York, with its Southwestern Regional Office in Bellaire (near Houston), Texas; and Montgomery Ward & Co. Inc., would tie together Corporate Headquarters in Chicago with Northeastern Regional Headquarters in Catonsville (near Baltimore), Maryland. Later, Aetna Life & Casualty would participate.

During mid-1977, final arrangements were made, an evaluation plan was submitted to NASA, final approval was received from FCC, and CTS satellite time schedules were established.

#### **The PROJECT PRELUDE System**

Prior to PROJECT PRELUDE, COMSAT Labs had decided to build a larger 12/14 GHz earth station, utilizing R&D funds. Upon joining forces with SBS for PROJECT PRE-

*(Continued on page 10)*

*Equipment testing at COMSAT Labs during the design stage prior to the SBS-CTS experiment.*



## Imagination and Labs' know-how contribute to Project Prelude success

BY J. KAISER

PROJECT PRELUDE is the result of a lot of imaginative thinking evolving from the small-terminal experiment using the CTS and conducted by the Labs. Such thinking bore fruit when SBS expressed the desire to participate in a similar experiment for the transmission of digital communications.

The Labs constructed two completely self-contained, road-transportable earth terminals for the project. SBS contracted for one of these terminals, and the other was constructed for the Laboratories.

After several design concepts were proposed and discarded, we settled on a trailer-mounted antenna complete with an electronics shelter and AC power generator with a separate tow vehicle. This arrangement permitted the earth terminal to be an integral unit, with most of the interconnect cabling remaining connected during transit, and it allowed the tow vehicle to be used for local transportation for the station operators at each site. The design of the earth terminal electronics was based to a large extent on the experience obtained from the earlier small-terminal experiment with CTS.

The design goal was to have two completely self-contained terminals that could transmit and receive full color TV, three high fidelity program channels and, alternatively, transmit and receive digital data up to about 1.5 megabits per second (MBPS), as well as three voice channels. The terminals had to be easy to set up in the field, had to survive thousands of miles of road travel, and were supposed to operate in adverse weather conditions. Furthermore, both terminals were to be operational in a relatively short time frame. Since we really didn't get started until well into the Spring of 1977, the receipt

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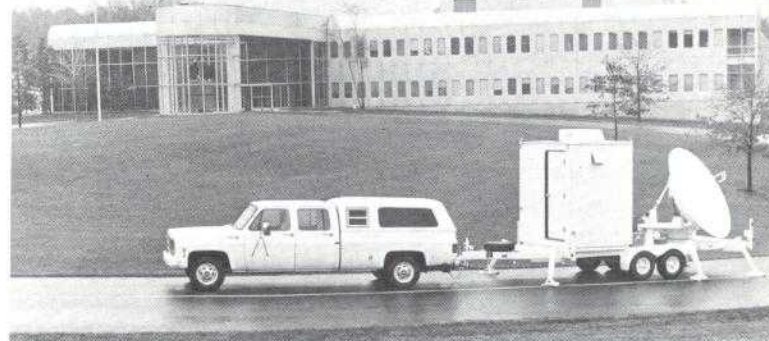
*Mr. Kaiser is Manager, Small Terminal Projects, COMSAT Laboratories, Clarksburg, Md.*

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of crucial components directly affecting our schedule became our most pressing problem.

After weeks of arduous work by engineers, technicians, draftsmen, shop and assembly personnel, some of whom literally worked around the clock, the first terminal was completed and on its way to California. The second terminal, destined for Pittsburgh, was ready for delivery the following morning when trouble hit—trouble in the form of a mechanical quirk that caused the electric trailer brakes to lock by themselves in a random fashion. At the Laboratories we are prepared for electronic problems, misbehaviors of microwave

*The Labs-designed, trailer-mounted antenna complete with electronics shelter, AC power generator and separate tow vehicle.*



modules, degradations of digital circuits and the like, but this mechanical anomaly seemed to defy solution, until painstaking probing resolved the problem—a slight misalignment of the backing plate on the axle. With the problem corrected the second terminal went on its way on schedule. Both terminals have since worked well.

The basic parameters of the terminals were as follows: Antenna diameter: 2.4 m; G/T: 20db/K; max transmit power: 28 watts at 14 GHz. The electronics package allowed transmission of either FM TV with three high fidelity audio channels, or digital data up to 1.5 MBPS with three single-channel-per-carrier FM audio channels. The changeover between these two operating modes was accomplished by a unique I.F. Configurator arrangement. The

electronics shelter housed all of the I.F. baseband and test equipment, as well as the Harris Corporation's digital modem. The complete trailer with its AC generator weighs 9,000 lbs.

In addition to the basic terminal we constructed two master control units (MCU), to be used in the demonstration conference rooms. These MCU's permitted the different digital equipments to be sequentially connected to the terminal by a simple switch selection. They also contained the signal conditioners for the 1,000 feet of cable between conference room and terminal. The conference room equipment also contained an echo control unit that made it possible to carry on interactive teleconferencing between the audiences in the two distant sites *via satellite*

without delay echo problems.

The terminals contain a number of unique features including a compact arrangement of the traveling wave tube (TWT) transmitter, based on the design concept used in the earlier CTS experiment; a unique low noise FET receiver, operating at the 12-GHz receive frequency, and an antenna feed system that incorporates band-pass transmit and receive filters and a transmit power monitor within the waveguide structure.

The author was the overall project manager for the Labs' effort, with Eric Ackermann responsible for the design of the antenna mount, trailer, and electronics shelter with assistance from the Antenna Lab and the Structures Group. Jeffrey Steinhorn designed the I.F. configurator, Lester Veenstra designed

*(Continued on page 18)*

## SBS PRELUDE

*(Continued from page 8)*

LUDE, COMSAT Labs commenced building two transportable earth stations, one of which would become the property of SBS. COMSAT Labs personnel were scheduled to man one earth station; experienced COMSAT GENERAL earth station operators, under contract to SBS, would man the other.

The satellite communications system put together was designed specifically for PROJECT PRELUDE to achieve the experiment's objectives. It was neither a prototype system, nor one which would be procured "off-the-shelf."

The system combined available business and communications equipment and utilized the capabilities of the CTS.

PROJECT PRELUDE had earth stations with eight-foot antennas, smaller than the 5-7 meter antennas of the SBS Operational System; it was not a TDMA (time division multiple access) nor a fully integrated, all-digital system. It could not operate at the higher data rates at which the SBS Operational System will be capable, nor did it contain burst modems.

### PROJECT PRELUDE Operations

Equipment, earth stations and personnel were brought together at COMSAT Labs in the early fall of 1977 for several weeks of testing and rehearsals. In late October, the mobile earth stations and vans loaded with the business equipment moved out to the first sites at Rockwell International facilities in Pittsburgh and Seal Beach.

During the next four months, from November 1977 through February 1978, PROJECT PRELUDE functioned as an experiment in innovative business communications that for the first time placed satellite communications and diversified business equipment into a joint test in a realistic business environment, with earth stations located on user prem-

ises, and actual business sessions conducted.

At each user site, conference room mock-ups arranged by the host company contained the advanced business, computer and communications hardware. This was linked by communication cables to the earth stations located in adjacent parking lots.

"Live" sessions were held several times daily on each of the two or three days a week that the CTS was available for PROJECT PRELUDE. Three types of scripted sessions were presented—a general overview employing all phases of the experiment (teleconferencing, data processing and document distribution) and specialized sessions devoted exclusively to either data processing or document distribution.

Presenters and teleconferencing "players" were SBS personnel. Freeze-frame transmission, employed extensively during each teleconference session, and full-motion, two-way color television were used.

The sessions illustrated the potential of intracompany teleconferences by satellite. The close parallel between an actual conference and a teleconference was apparent. Not only was eye contact possible in the teleconferences, but conferees were able to pass documents back and forth, use flip charts, and retrieve data from a "central" storage location for simultaneous displays at each site. Digital transmissions between the two sites of each host company were at a maximum data rate of 1.544 Mbps.

Pages of business material were sent via the satellite in 20 seconds, arriving as hard copy. Color freeze-frame pictures were transmitted via the CTS in half a second, compared to two and a half minutes required by normal telephone lines.

Console controls permitted either the full motion or freeze-frame mode, and camera selection. The SBS players showed how a business conferee of the future will act as his own director for a teleconference and conduct it

almost as easily as he operates a slide projector today.

Also available to the control consoles were pre-stored frames on video discs. By pushing a button, remote retrieval of this information permitted evaluation of how future commercial systems will permit stored information to be instantly identified, retrieved and transmitted, thereby making central files immediately available to anyone on the network.

The greatest number of periods, and perhaps the most interesting ones during PROJECT PRELUDE were "hands-on" sessions. Most companies and vendors took advantage of the PROJECT PRELUDE system to conduct "hands-on" satellite business meetings, teleconferences, and training programs, and for the rapid exchange of documents and other data between the two sites. One example involved the presentation and transmission to the other site of a briefing which earlier had been made locally at a corporate headquarters.

The teleconferences—in full-motion, freeze-frame, or a combination of both—were held to assess their potential as a cost-effective substitute for some business travel and a key enhancement of voice communications.

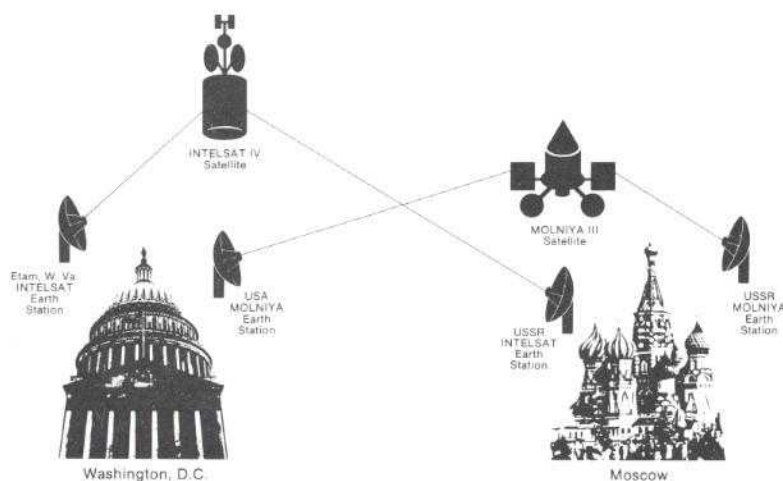
Specialized data sessions tested some of the benefits of high-speed data transmission via satellite. PROJECT PRELUDE's data rate of 1.544 megabits per second was thirty times faster than the typical 50 kilobit data transmission rate considered today to be high-speed.

Following the end of the original three-month period, PROJECT PRELUDE was extended to include a one-month experiment by Aetna Life & Casualty to test and evaluate teleconferencing techniques.

One earth station was at Aetna's home office in Hartford, Connecticut. The second, which had been used for the January segment at Montgomery Ward & Co., Inc., corporate headquarters in Chicago, remained

*(Continued on page 18)*





### Washington to Moscow (Hotline) Direct Communications Link

A new Washington-Moscow Hot Line using satellite communications entered operational service recently. The new satellite Hot Line, officially named the Direct Communications Link, or DCL, consists of two independent satellite systems that are expected to provide communications service of higher reliability than the existing cable and the recently discontinued high frequency radio systems.

The initial Hot Line has been in operation between Washington and Moscow since 1963 and provides a direct means of communication between the heads of state of the U.S. and U.S.S.R. It is designed for use during periods of increased international tension or emergency.

The DCL, like its predecessor system, and contrary to widespread public belief, is designed to exchange printed messages and not telephone calls. Printed messages have the advantage of overcoming language barriers, avoiding possible misunderstanding by translators, and providing a written record of the traffic which was sent.

Hot Line teletype messages from the U.S. to U.S.S.R. are transmitted in the English language using the Latin alphabet. All messages from the U.S.S.R. are transmitted to the U.S. in the Russian language using Russian (Cyrillic) characters. All

messages including test messages are automatically encoded upon transmission and decoded upon receipt. Circuits are tested hourly using a variety of sample messages. Normally, items such as non-political passages from magazine articles and books are used in the text of test messages.

#### The New System

The new satellite Hot Line incorporates many technological advances. Satellite communications are increasingly being used to supplement terrestrial systems for long distance communications. The DCL is less vulnerable than the present system since it depends to a lesser degree on extensive terrestrial microwave or cable relays and eliminates dependence on third country facilities. Further, the DCL is not susceptible to interruptions caused by atmospheric interference problems common to high frequency radio systems.

The two DCL satellite systems employ the Soviet MOLNIYA and the commercial INTELSAT satellites. Both the MOLNIYA and INTELSAT DCL systems operate simultaneously so that if one system fails, the other system continues to provide communications. In the MOLNIYA system, there are four satellites which operate in highly elliptical, inclined orbits. Each satellite is used for approximately six hours a day as the satellites sequen-

tially come within the view of both the U.S. and U.S.S.R. earth stations. On the other hand, in the INTELSAT system, coverage is obtained from a single satellite positioned in a geostationary orbit 22,300 miles over the mid-Atlantic Ocean at the equator.

Within the U.S., there are two satellite earth stations associated with the DCL. One of the earth stations, located at Fort Detrick, Maryland, is dedicated to the DCL and operates twin 60-foot satellite antennas for use with the MOLNIYA satellites. The new Moscow Hot Line is a major project accomplished by the U.S. Army Communications Command. The MOLNIYA Earth Station at Fort Detrick was constructed and installed by the Harris Corporation, under the direction of the U.S. Army Satellite Communications Agency. Current operations and maintenance at this station are performed by the Harris Corporation under contract to the U.S. Army Communications Command.

The second U.S. earth station is the COMSAT-operated station at Etam, West Virginia. ITT World Communications, Inc. which provides the initial Hot Line is also under contract to the U.S. Army and is responsible for providing and maintaining the DCL circuit that uses INTELSAT facilities. Another ITT subsidiary, ITT Space Communications Inc., designed and produced the satellite communications equipment for the terminal near the city of Lvov, in the USSR.

In the Soviet Union, two MOLNIYA earth stations serving the DCL are located near Moscow. Two INTELSAT earth stations, a primary and a back-up station for the DCL, are at Lvov and Moscow.

#### Hot Line History

The need for a Washington-Moscow Hot Line, as a means of reducing the risk of intentional or accidental nuclear confrontation, was first recognized in the late 1950's. In the fall of 1962 The Cuban Missile Crisis further underscored the critical need

*(Continued on next page)*

(Continued from page 11)

for a direct line of communication between the heads of the U.S. and U.S.S.R. At the height of the Cuban crisis, delays in communications between the two sides prevented a continual assessment of events as they developed. Misunderstandings caused by the lack of direct communications could have led to an actual nuclear confrontation.

After the missile crisis subsided, both the U.S. and U.S.S.R. moved toward the establishment of a Hot Line as a matter of urgent priority. The original Washington-Moscow Hot Line was subsequently activated August 30, 1963, and has been in continuous operation since that time.

During its more than 14 years of existence, the most notable use of the Hot Line occurred during the Arab-Israeli six-day war in 1967 when President Johnson advised the U.S.S.R. of U.S. ship and aircraft movements in the Mediterranean following an Israeli attack on the *USS Liberty*.

On rare occasions, inadvertent service interruptions have occurred which temporarily disrupted Hot Line communications. Most interruptions have occurred on only one of the two Hot Line paths, but a few interruptions have affected both primary and alternate circuits. Accidental outages have been caused by: a farmer in Finland cutting a Hot Line cable with his tractor; a manhole fire near Baltimore resulting in the loss of the primary circuit; and telephone workers in the U.S. inadvertently severing both Hot Line cables.

The new DCL configuration is a result of the first phase of the Strategic Arms Limitation Talks (SALT) between the United States and the Soviet Union. In September 1971, as part of the initial SALT negotiations, it was mutually agreed by the two countries to improve the reliability of the Hot Line configuration linking Washington and Moscow by using modern satellite communications technology.

## TTC&M negotiations authorized with COMSAT and other signatories

The Thirty-first Meeting of the INTELSAT Board of Governors was held at INTELSAT Headquarters in February 1978. Among its actions the Board:

### INTELSAT System Matters

- Authorized the Director General to negotiate with selected Signatories, including COMSAT as U.S. Signatory, for provision of TTC&M services for the period 1980 through 1984. COMSAT was selected for negotiation for TTC&M at Andover and Paumalu, and monitoring at Etam.

- Authorized the Director General to execute an amendment to the INTELSAT V spacecraft contract in the amount of \$290,000 to delay casting of the third and fourth apogee motor lots, and decided not to accept NASA's offer of a fifth Atlas Centaur to be used by November 1980.

- Requested the Director General to pursue study of options for the provision by INTELSAT of the space segment capacity for maritime satellite service either to its signatories and users or in a leased form to INMARSAT; authorized the Director General to establish contact with appropriate European entities as well as potential spacecraft suppliers in order to complete the study; and authorized submission of further documentation to Panels of the INMARSAT Preparatory Committee. The Board referred the practical, technical and operational factors involved in the inclusion of a maritime package on INTELSAT V, and the impact these factors could have on the INTELSAT V program, to the next meeting of the BG/T, and scheduled an additional BG/T meeting for May 17-24.

- Authorized launch of the INTELSAT IV-A (F-6) at the earliest possible time for service as the primary satellite in the Indian Ocean Region, at a nominal location of 63°E. Longi-

tude, and decided not to exercise the option for procurement of additional INTELSAT IV-A's.

- Approved agreements for the preemptible lease of one-half transponder to Saudi Arabia and one full transponder to Zaire, to meet their respective domestic telecommunications requirements. With this new agreement Saudi Arabia will lease a total of two and a quarter transponders for domestic service.

- Decided to tender advice to the Meeting of Signatories that the domestic service on mainland links in India's leased one-quarter transponder should be considered on the same basis as international services, pursuant to the INTELSAT agreement.

### Financial and Organizational Matters

- Requested the Director General to conduct an in-depth financial study and market evaluation of transponder leases, including the appropriateness of the present charges.

- Noted a report that pursuant to earlier authorizations the Director General had signed non-exclusive licensing agreements with Rixon, Inc., for echo canceller technology, with Eagle-Picher, Inc., for nickel-hydrogen technology, and with COMSAT GENERAL for certain computer software. The U.S. Signatory, pursuant to the Operating Agreement, had authorized each of these companies to obtain this data under appropriate agreements with INTELSAT.

- Approved establishment of four positions for the Office of Business Planning (a Business Planner, a Planning Assistant, two secretaries) and increased the 1978 Budget by \$98,000 to reflect the new staffing.

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*The preceding report was prepared by Ellen D. Hoff, INTELSAT Affairs, International Operations Division*

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## COMSAT announces agreement on proposed settlement of rate case

COMSAT has announced agreement between its management and representatives of the Chief of the Common Carrier Bureau and the Office of the General Counsel of the Federal Communications Commission (FCC) on the terms of a settlement of the extended COMSAT rate proceeding. (The proceeding relates only to COMSAT's rates for its international services through the INTELSAT global satellite system and does not relate to COMSAT's non-INTELSAT operations.)

The proposed settlement is the product of negotiations among counsel for principal parties to the rate proceeding. It would establish the basic principles governing COMSAT's rates for its international services through the INTELSAT system and would resolve questions raised by the FCC concerning the sufficiency of an escrow fund maintained by COMSAT since mid-1976 pending the outcome of judicial review of a December 1975 FCC rate decision.

The proposed settlement is subject to approval by the FCC after public notice and opportunity for comment.

Upon final FCC approval of the proposed settlement COMSAT would withdraw its petitions for further review of the December 1975 rate decision. Seven business days after final FCC approval of the proposed settlement COMSAT would file new tariffs with the FCC. As a result of the proposed settlement, together with increases in international satellite traffic and economies attributable to technological gains resulting in cost savings per unit of satellite capacity, the charges paid by COMSAT's customers in 1978 would be approximately 48 percent below what they would be if COMSAT's rates in 1975 had remained in effect.

The new tariffs would be in accordance with the December 1975 rate decision with the following modifications to reflect adjustments required by the U.S. Court of Appeals for the District of Columbia Circuit as well as other adjustments incorporated in the proposed settlement:

- a. COMSAT would include in its rate base 75 percent of its net investment in COMSAT Laboratories.
- b. With respect to INTELSAT construction projects COMSAT would include its capital contributions to INTELSAT in the COMSAT rate base in lieu of crediting income with interest during construction, and with respect to other construction projects relating to its global system operations COMSAT would continue to credit income with interest during construction and would compute it at nine percent.
- c. COMSAT's allowed rate of return on equity would be 12.2 percent.
- d. When COMSAT actually incurs debt equal to 45 percent of its rate base, its allowed rate of return on equity would be 13.2 percent to reflect the added risk of debt, and COMSAT's overall allowed rate of return for INTELSAT services would be 13.2 percent times 55 percent equity plus the prevailing interest rate for A-rated public utility bonds at the time COMSAT actually acquires debt times 45 percent debt (with an additional one percent in rate of return for efficiency as provided for in the 1975 rate decision).
- e. Until The Corporation incurs debt equal to 45 percent of its rate base, its overall allowed rate of return would be 11.48 percent to reflect the gradual imputation of 45 percent debt over a five-year period beginning January 1, 1979 (with an additional one percent in rate of return for efficiency as provided for in the 1975 rate decision).

Under the FCC's 1975 rate decision,

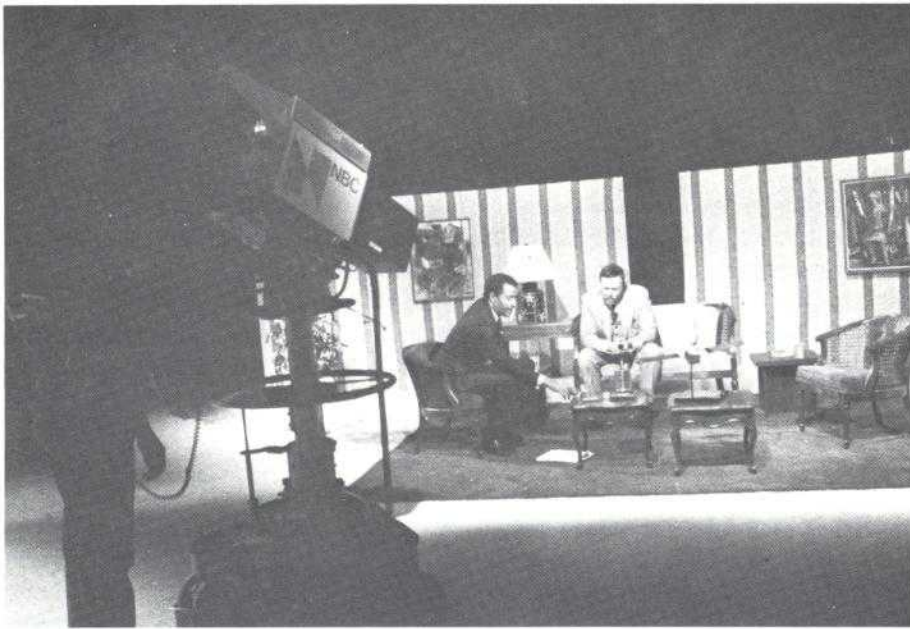
before modification by the Court of Appeals and the other adjustments reflected in the proposed settlement, COMSAT's rate of return on equity would have been 11.3 percent, its overall rate of return after imputation of debt would have been 10.8 percent, its investment in its laboratories would have been excluded from rate base, and its capital contributions to INTELSAT would have been excluded from rate base and instead would have been accounted for as a credit to income for interest during construction.

Under the proposed settlement COMSAT would relinquish all claims to the amounts placed in escrow for the period through December 31, 1977 (\$92.2 million plus interest totaling \$3.5 million). COMSAT would make an additional payment to the escrow fund of \$5.9 million for the period September 9, 1977, through December 31, 1977, on the assumption that it voluntarily had filed revised tariffs as of September 9, 1977, based on the elements of the proposed settlement relating to the formulation of COMSAT's rates, and the FCC would vacate an order it issued on December 7, 1977, concerning the sufficiency of the escrow fund.

Refunds to customers of the amounts in escrow for the period through December 31, 1977, would be subject to further order of the FCC. Deposits in the escrow fund for the period from January 1, 1978, to the date of the final settlement would be divided between COMSAT and its customers as if the new tariffs had been in effect beginning on January 1, 1978.

COMSAT estimates that if it had to make additional payments for past periods to the escrow fund under the FCC's December 7, 1977, order, COMSAT's 1977 net income would be reduced by \$13.4 million. Instead,

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## Colino on local talk show

*Richard R. Colino, Vice President and General Manager, International Operations Division, right, is interviewed by Fred Thomas, Host of WRC-TV's Channel 4 talk show "Sunday" as part of COMSAT's Fifteenth Anniversary activities.*

*(Continued from page 13)*

under the proposed settlement COMSAT's additional payment to the escrow fund of \$5.9 million would have the effect of reducing 1977 net income by \$3 million. COMSAT has issued financial statements for 1977 reflecting the terms of the proposed settlement.

### Background on Rate Proceeding

**General.** In December 1975 the FCC issued its decision in its long-pending investigation of COMSAT's rates for global system services. Among other things, the FCC decision disallowed more than half of COMSAT's proposed rate base by eliminating from it items that were designed to enable the Corporation to recoup deficiencies in the return on its investment during its start-up years. In addition, the FCC limited the Corporation to a rate of return of 10.8 percent on the reduced rate base it prescribed (although it said it would allow a return of 11.8 percent if that could be achieved through operating efficiencies). The FCC derived the 10.8 percent rate by permitting a rate of return on equity of 11.3 percent and, at the same time, imputing to COMSAT a capital structure including 45 percent debt (at an interest cost of 10.2 percent).

On COMSAT's appeal of the FCC's

December 1975 decision, the U.S. Court of Appeals for the District of Columbia Circuit in October 1977 affirmed the FCC's decision in major respects. Among other things, the Court upheld the FCC's conclusion that the Corporation is not entitled to an opportunity to recoup return deficiencies incurred during its start-up period. However, the Court made rulings favorable to COMSAT with respect to inclusion in the rate base of part of COMSAT's investment in its laboratories, rate of interest during construction and imputation of debt. The Court ruled that although the FCC may properly impute 45 percent debt to COMSAT's capital structure, it may not do so retroactively and must give COMSAT a reasonable opportunity to phase debt into its capital structure over a period of years.

**Escrow Fund.** In November 1977 COMSAT sought further judicial review of the FCC's 1975 rate decision by filing a petition for rehearing and a suggestion for rehearing *en banc* with the Court of Appeals. These pleadings are still pending.

Since mid-1976 COMSAT, pending the outcome of judicial review, has maintained an escrow fund pursuant to an FCC accounting order, and has been placing in escrow, for possible refund in whole or in part to its common carrier customers, revenues

amounting to the difference between its present charges for global system services and charges calculated on the basis of lower rates filed with the FCC as "informational" tariffs formulated by COMSAT in accordance with the FCC's 1975 rate decision.

The FCC on December 7, 1977, ordered COMSAT (1) to make a retroactive addition to the escrow fund of the amount (plus interest thereon) by which COMSAT's earnings since mid-1976 had exceeded the 10.8 percent rate of return set forth in the 1975 rate decision, and (2) to file new informational tariffs designed to produce a 10.8 percent rate of return, to amend such tariffs at intervals of not more than 120 days so as to maintain that rate of return, and to pay into the escrow fund amounts collected in excess of rates that would produce the 10.8 percent rate of return.

On December 27, 1977, COMSAT filed with the FCC a petition for reconsideration of its December 7 order and a petition to stay the effect of the December 7 order pending FCC action on the petition for reconsideration.

On January 25, 1978, the FCC stayed only that part of its December 7 order that would require COMSAT to make retroactive additions to the escrow fund.

## COMSAT General selected by ARABSAT for consulting services contract

COMSAT GENERAL Corporation has been selected by the Arab Satellite Communications Organization (ARABSAT) to provide comprehensive consulting services for the establishment of a new regional satellite communications system. The system will expand and improve telephone and telegraph communications and television transmission among the 21 countries of the Arab League.

COMSAT GENERAL was selected from among a number of companies that had submitted competitive bids. The total value of the contract to be negotiated for technical consulting services is estimated at approximately \$16 million to \$21 million, depending on services required.

During the five-year contract period, COMSAT GENERAL will provide a range of services, including system design, preparation of hardware specifications, monitoring of construction of spacecraft and ground control facilities, launch assistance, and an initial period of system operations.

ARABSAT's headquarters are in Riyadh, Saudi Arabia, where COMSAT GENERAL will establish a program office as part of its responsibilities under the proposed contract.

Under the organization proposed by COMSAT GENERAL to ARABSAT, Kenneth F. Manning will be Program Manager, and Donald S. Kutch will be Deputy Program Manager, both as members of the Program Office at COMSAT GENERAL Headquarters in Washington. James E. Whitworth will be Deputy Program Manager in charge of the COMSAT GENERAL Office in Riyadh.

## Dunlop and Stockel get Labs' awards

James D. Dunlop and Joseph F. Stockel of the Applied Sciences Laboratory have been awarded the 1978

## Charyk appears on TV's "AM Washington"



COMSAT President Joseph V. Charyk, extreme right, discusses COMSAT's contributions to the advancement of satellite communications with hosts Ed Walker and Ruth Hudgens on Channel 7's television show "AM Washington."

## Assistance provided India for evaluation of spacecraft proposals

COMSAT GENERAL Corporation supplied a 10-man team to assist the Department of Space of the Government of India in evaluating spacecraft proposals for the INSAT-I program.

The team of COMSAT and COMSAT GENERAL personnel arrived in Bangalore, India, in February and worked at Department of Space facilities there for approximately one month. The members of the team included James Wilde, William Kenny, William Sandrin, Donald Kutch, Brent Bohne, William Keck, William Korbin, William Huston (consultant), William Snow and Brij Agrawal.

The work in February followed an earlier visit, in September 1977, of a seven-member team of COMSAT and COMSAT GENERAL personnel who spent

ten days in Bangalore helping prepare the specifications and RFP package. Thus, COMSAT GENERAL, at the request of the Government of India, provided assistance on both the preparation of the RFP, and on the subsequent evaluation of the responses by spacecraft manufacturers to the RFP.

The INSAT-I program involves the development of a two-spacecraft domestic system to provide telecommunications in the 4- and 6-GHz frequency bands, television broadcasting in the 2.5-GHz frequency band, and meteorological satellite services comprising data relay from unattended data collection platforms and meteorological earth observation. India proposes to initiate service via this new domestic system in early 1981.

COMSAT Labs Research Award, according to COMSAT Laboratories Director B. I. Edelson.

The Award cited Dunlop and Stockel for their contributions "in the research and engineering work ... which led to the invention and development of the nickel-hydrogen battery.

"Your search for a long-life, reliable, lightweight battery culminated with the flight of the NTS-2 satellite. Here, not only the capabilities of the nickel-hydrogen batteries were fully evidenced, but the mission itself was saved by their availability on board for extremely demanding operational maneuvers."

## Textbook launch places AMSAT-OSCAR 8 in orbit

In a textbook launching sequence the AMSAT-OSCAR 8 satellite was placed in orbit in early March as one of the two passengers on the Landsat C launch vehicle. Amateurs around the world cooperated in reporting and relaying the initial telemetry reception reports. It is the eighth in a series of space satellites built by radio amateurs to be placed in orbit as piggyback payloads by U.S. launch vehicles.

The AMSAT-OSCAR 8 spacecraft underwent thermal vacuum testing at COMSAT Laboratories. Several members of the COMSAT Amateur Radio Club assisted AMSAT personnel in the test. This spacecraft was the first complete spacecraft ever to be given a thermal vacuum test at the Laboratories. AMSAT-OSCAR 8 was not the first OSCAR satellite tested at the Laboratories, for its older brother AMSAT-OSCAR 7 underwent RF testing in the anechoic chamber at the Laboratories.

OSCAR is the acronym for Orbiting Satellite Carrying Amateur Radio. OSCAR 1, launched in December 1961, was a simple, battery operated radio beacon. Subsequent OSCARS have evolved into long-lived communications relay satellites available for use by amateur operators around the world.

AMSAT-OSCAR 6, launched with the ITOS-D in October 1972, operated successfully in orbit for four and one-half years before ceasing to transmit in June 1977. AMSAT-OSCAR 7, launched with ITOS-G in November 1974, continues to function well and is heavily used both for amateur communications and as an educational tool bringing space science and applications into the classroom.

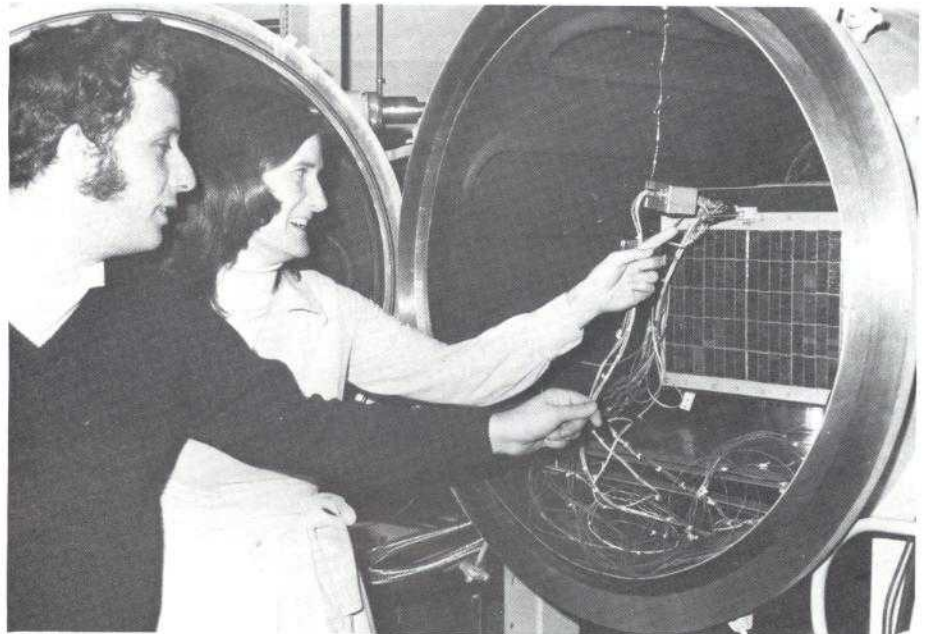
Using curriculum material provided by the American Radio Relay League and assistance from local amateur radio operators, science teachers in school systems throughout the country are being provided an opportunity to give their students a direct hands-on experience working with their own space satellite.

By building simple ground sta-

tions, making orbital predictions and operating with the satellites, students are being challenged to develop their skills in science and mathematics while experiencing the excitement of space communications.

Other applications with OSCAR satellites have included small terminal, multiple-access communications experiments; emergency communications exercises; and early tests of

one in the U.S.) along with command and telemetry systems. Both transponders use the same up-link frequency passband centered on 145.9 MHz but employ different down-link frequencies with passbands centered on 29.4 MHz and 435.1 MHz. Because of power limitations, plans call for operating only one transponder at a time. Spacecraft stabilization is provided by permanent



*Joe Kasser, explains to Labs employee Norma Moran the testing being carried out on the AMSAT-OSCAR 8 satellite in the Thermal-Vacuum Chamber at the Labs. Kasser is Publicity Director of the Radio Amateur Satellite Corporation (AMSAT).*

the search and rescue location systems currently under development by NASA.

AMSAT-OSCAR 8 is intended as a replacement for AMSAT-OSCAR 6 and will be used for continuation and expansion of the educational program. It is a small solar powered spacecraft, rectangular in shape, weighing 27 kilograms (60 pounds) and containing two communications transponders (one built in Japan,

magnets and permalloy hysteresis damping rods.

The spacecraft was developed under the auspices of the Radio Amateur Satellite Corporation (AMSAT) in cooperation with the American Radio Relay League, Inc. AMSAT is an international, non-profit organization of radio amateurs which is based in Washington, D.C., and has been responsible for the last four OSCAR satellites.

## Community involvement

### COMSAT speakers tell students "stay in school"

BY GLENDA COOPER

Sherry Wells of COMSAT's Accounting Department was stressing a basic point for her audience of Jefferson Junior High School students, "Career opportunities in business and industry are increasing, however, you must prepare yourselves. Stay in school."

Sherry is one of COMSAT's group of volunteers making the rounds of schools in the Metropolitan Washington area with the objective of encouraging young people to get a good education and to prepare themselves for meaningful careers.

The COMSAT group is part of the Youth Motivation Task Force (YMTF), an organization of men and women dedicated to motivating youth to stay in school, initiated in 1965 by Senator Hubert H. Humphrey. Specifically, the purpose of YMTF is to convince youth, particularly the disadvantaged, of the importance of getting a good education and taking advantage of the increasing career opportunities in business and industry. The program is under

*Sherry Wells of COMSAT's Accounting Department leads a discussion with Jefferson Junior High School students on future career opportunities.*



*COMSAT Information Officer Allan Galfund conducts Jefferson Junior High School students on a tour of COMSAT's Operations Center.*



the auspices of the National Alliance of Businessmen (NAB).

YMTF also seeks to prevent young people from entering unemployable career fields by acquainting the students with career areas with employ-

ment potential and encouraging them to properly prepare themselves in these fields. The discussion leaders cite their own educational experiences and relate them to their present occupations.

*(Continued on next page)*

### JA Program a continuing success

BY RICHARD KEEFER

One of America's greatest contemporary problems is the education, or lack thereof, of its youth. During the past several years numerous studies have pointed out the inadequacy of our educational system. College freshmen who cannot read at a ninth grade level or recognize excerpts from the preamble to our Constitution are the rule, not the exception.

However, in the midst of this crisis, Junior Achievement (J.A.) stands like a lighthouse, ready to guide and help these young people. Instead of

allowing students to go through life without a basic knowledge of the economic system in which they find themselves, in much the same way our educational system is failing to acquaint them with our system of government, J.A. strives to impart an understanding of capitalism, of the profit motive, and of the many facets of a business in a real-world economy.

COMSAT began participating in J.A. program in 1976. This participation consisted of a monetary contribution to Junior Achievement and a volunteer team of advisors for each company it sponsors. The current advisory team consists of Mel Williams, Human Resources Administrator, Executive Advisor; Cynthia Clarke, Attorney; Johan Curtin,

Financial Analyst; Aaron Goldsmith, Staff Engineer; Richard Keefer, Senior Accountant, and Mike Smith, Auditor, assisting Mel as advisors to the Companies. This advisory team selects starter products for the companies and helps them to get organized.

The 1977-1978 J.A. year finds COMSAT sponsoring two companies from Robert E. Lee High School in Springfield, Virginia. *Regnulp Enterprises* currently has ten members with Richard Cotton serving as President and Chairperson of the Board. *Inspirations Enterprise* has twelve members with Karen Hornberger as President and Chairperson of the Board. Currently, both companies are manufacturing and marketing the same product, an auto trouble light.

(Continued on page 17)

The men and women who make up YMTF, all volunteers from businesses and industries in the area, visit schools in the metropolitan region leading discussions which, according to the program's objective, "will help to build a bridge between school today and meaningful jobs tomorrow."

COMSAT employees serving as volunteers include Mel Williams, COMSAT coordinator, Irma Burris and Yvonne Dupree of Personnel, Melvin Harley of Graphics, Sylvia Walker of the INTELSAT Management Division and Sherry Wells of Finance.

### SBS PRELUDE

(Continued from page 10)

at that site where Aetna utilized conference room facilities.

### Evaluation of PROJECT PRELUDE

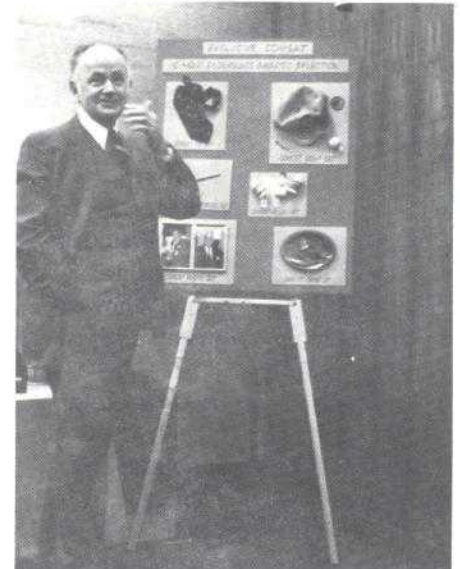
At the conclusion of each session, observers and, if appropriate, participants were asked to complete questionnaires. More than one thousand of these appraisals will be available for evaluation.

The data compiled from this analysis, plus a technical evaluation of communications quality and equipment performance to be made by COMSAT Labs, will be combined by SBS into a formal report to be submitted to NASA and FCC. Copies of the report will be made available to interested parties.

The findings of the report are expected to provide some market research answers that many companies have been awaiting—Are the earth stations practicable? Will business people use this type of communication system? Will such services improve the utilization of human resources, increase productivity, and provide a better tool for management?

PROJECT PRELUDE was unique. Nothing like it had been attempted before. Twelve companies jointly sponsored the experiment, each funding its own participation, with no money exchanging hands. SBS was the catalyst.

## Charyk Fifteenth Anniversary



George Lawler (photo at left), Director of Sales and Business Development, offers remarks prior to unveiling awards presented to Dr. Joseph V. Charyk commemorating his Fifteenth Anniversary as President of COMSAT. In photo at right, Dr. Charyk examines the "Exclusive COMSAT 15-Year Endurance Awards Selection" which included a COMSAT tie set, golf set, pen and pencil set (minus the pencil), hockey set, a photo set and a set of COMSAT china.

### LABS PRELUDE

(Continued from page 9)

the MCU and applied considerable digital signal knowhow to get all the different vendors' equipments signals sorted out, right side up and compatible with the modem. Fred Seidel saw to the many mechanical construction and installation problems, and Don Wentworth was the designer-draftsman throughout the entire design phase. The echo control units were designed by George Szarvas, Mike Onufry and John Phipps.

The SBS terminal was operated by M. "Bart" Bartlett, COMSAT GENERAL earth station engineer, and Leslie Goya, senior technician from the Hawaiian earth station, both on loan to SBS. The COMSAT terminal was operated by Lester Veenstra and Fred Seidel from the small earth terminals project of the Transmission Systems Lab. Arrangements for getting all of the equipments to the various locations and supervising the installation of cables and conference room equipment were made by R. McBride and R. Yard of COMSAT GENERAL.

Tom Rush of SBS was the overall project manager, with Jim Dalby and Herb Schnipper providing technical coordination between SBS and COMSAT Labs. The actual on-site demonstrations were handled by marketing personnel of SBS.

All of the Laboratories—the Model Shop, Drafting, Assembly, and Labs facilities—contributed jointly to the success of this project which encompassed various facets of electronic, mechanical, and vehicular design and was completed on schedule and within budget limits, despite many design changes along the way and component delivery slippages. The terminals have been in use for four months as of this writing and have performed exceptionally well in spite of the severe winter weather conditions in Chicago, Illinois, and Hartford, Connecticut, earlier this year.

At the conclusion of Project Prelude, the terminals will be used for a number of test and measurement functions in the 12/14 GHz frequency bands.



## Ski Club activities continue year-round

This year's Ski Club was larger and more active than ever before. The trips we took were popular and successful. Many new members were introduced to the exciting sport of skiing, and many an "old pro" improved his technique.



*The group poses . . .*



*buckles up . . .*



*Massanutten Ski Lodge, Virginia*

In addition, the Club sponsored its first cross-country trip to the woodlands of western Maryland and, judging from the response, it won't be the last. During Club meetings, enlivened with movies and refreshments, we laughed at pictures of ourselves on the slopes and exchanged ski tales. Ideas for trips this summer include day skiing on the grass slopes at Bryce Mountain or a white-water float trip.



*takes the ski lift . . .*

Responsible for this active schedule are Club President Ron Letteney, Vice-President Neil Helm, Secretary Ed Mikus, Treasurer Dick Hunt, and Board members Lisa Cook and Jim Castellano.

So be careful as the year goes on for you might be lured into joining that Club whose crazy members get up at outrageous hours, to ride ridiculous distances, to pay money to fall in the snow.

—Ed Mikus and Lisa Cook



*to the top of the slope . . .  
for a graceful descent . . .*



*A break for lunch*



*A ski class*

*well, sometimes.*



## ANDOVER HISTORY (Continued from page 6)

contains deeds written by Orator-Statesman Daniel Webster who was employed there in 1802 while he was preceptor of Fryeburg Academy. According to local historian Mrs. Joel Leadbetter, Webster "moonlighted" copying deeds for the Registrar at 25¢ each. Managing two deeds a night, he was able to earn his \$2 weekly board thus leaving his salary clear.

Opposite the imposing First Congregational Church built in 1850, on Main Street, are the Peary Stones placed there in 1883 by one-time Fryeburg resident Robert E. Peary, the first man to reach the North Pole. The Fryeburg Public Library contains the collections of Clarence E. Mulford, author of the Hopalong Cassidy westerns, who lived many years in Fryeburg. In East Fryeburg is Hemlock Bridge, one of the last 10 covered bridges in Maine.

Norway and the county seat of Paris adjoin each other and work together as friendly rivals. Norway is about an hour's drive south of Andover. It is the site of New England's oldest snowshoe factory and produced the snowshoes and dog sleds used by the Byrd and Peary Arctic expeditions. Norway's printer, the Advertiser-Democrat, has been in operation almost a century-and-a-half and it was there that Humorist Artemus Ward learned the printing trade and Lincoln's first Vice President Hannibal Hamlin once worked as a chore-boy.

Unique in the realm of social institutions is Norway's Weary Club founded in 1922. Its members are "makers and dealers in cedar shavings, social gossip, political wisdom and Yankee philosophy." The Club is a haven for "tired old men to escape the wrath of their womenfolks, swap lies and fishing stories, and always have on hand a supply of straight-grained cedar for whittling."

Paris, the county seat, is divided into two major communities: South Paris, a manufacturing and commercial center, and Paris Hill, an old, exclusive neighborhood containing some of Maine's most interesting pieces of architecture.

South Paris is the site of the Annual Bean Hole Bean Festival which attracts thousands of visitors each July. The Festival pays homage to lumbering days when baking beans underground was the only approved method. Twelve-hundred pounds of red kidney and pea beans are placed in giant, cast iron kettles. Each batch of beans is covered with water and slathered (spread lavishly) with three-inch chunks of "sow belly" pork, then spiced with uniodized salt, white pepper, molasses and dry mustard. The bean-filled kettles are placed in brick pits filled with six cords of burning hardwood. Next, the kettles are buried beneath a foot of clean sand and left to bake for at least 30 hours. To complement the main course local ladies prepare 5,000 slices of brown bread moistened by 60 pounds of butter, 200 pounds of sauerkraut and a fantastic variety of pickles.

It is to Paris Hill that sightseers and students of history are attracted, drawn by imposing examples of early New England architecture with a backdrop formed by the mountains of New Hampshire. It is said that the area within a radius of a mile of the center of Paris has provided more men to serve in government than any other such area.

Paris Hill village remains much as it was many years ago. The classic meeting house built in 1803, recognized as a fine example of Greek Revival architecture, and now a Baptist Church, still stands with its bell tower containing an original bell cast by Paul Revere and acquired in 1821. Behind the church is the handsome home of Hannibal Hamlin, Abraham Lincoln's first Vice-President. The

Old Stone Jail, now a cheerful library inside, served as the Oxford County Jail until 1895.

A few miles north of Paris lies the community of Molly Ockett legend, West Paris. Trap Corner, a small community long before West Paris was settled, became famous for the story of the Indian Princess and her legendary gold. It is told that she was traveling from Andover to Paris Hill when a fortune in gold she was carrying became too heavy and she buried it beneath a tree, hanging a bear trap to mark the spot. Hence, the name Trap Corner. Also at West Paris are Snow Falls with a drop of 40 feet to the gorge of the Little Androscoggin River.

The West Paris Library is unique. The stone edifice looks like a small, medieval, English castle, complete with fortified tower for fending off attacks.

The classic New England town of Bethel is a little more than a half-hour's drive southeast of Andover. Internationally known for its Gould Academy, for a century it has been a popular summer resort and now winter recreation. White Mountain National Forest offers backpackers and hunters nearly 50,000 wilderness acres with more than 30 mountains within 20 miles. Cross-country skiers have free access to more than 30 miles of logging roads and thousands of acres of unposted wilderness are open to snowmobilers.

Not far out of West Paris en route to Bethel, a road intersects Route 26 at South Woodstock. A sign at the junction states, "I. W. Andrews and Son, Casket Manufacturers." A quarter-of-a-mile drive reveals what appears to be the typical New England farm scene complete with farmhouse, barns and power furnished by an ancient water-wheel. Little of the exterior suggests an industry employing a dozen people, full and part-time, producing and hand-finishing approximately 500 caskets a year.

Oxford County's largest community is Rumford, approximately 20 miles southeast of Andover. Here the Ellis, Swift and Concord Rivers flow into the Androscoggin (Indian word meaning "fish spearing stream"). It is the site of one of the largest paper mills in the world belonging to the giant Boise Cascade Group. The business section of Rumford sits on an island formed by a canal and three bridges connecting it with the mainland.

Viewed from one of the bridges entering the business district, the Androscoggin and Pennacook Falls



*Located in the heart of Maine's timber country, Andover's main industry is the Andover Wood Products Company, a subsidiary of the Ethan Allan furniture chain. A sizeable portion of the company work force is made up of women.*

present a spectacular picture as rushing water tumbles down a bed of solid granite supplying power for the paper mills which employ most of the working population. Rumford was first settled by Jonathan Keyes of Shrewsbury, Massachusetts, in 1777. It was incorporated as New Pennacook in 1795 and Rumford in 1800. The first settlers came mostly from Concord, New Hampshire, via Andover, Massachusetts, and the Massachusetts Bay Colonies. The early history of Rumford was closely tied to that of Andover—along the shores of the Ellis River and the Villages of Rumford Point and Center, and marriages were frequent between residents of

Andover and Rumford. Where the giant paper mills are now located became the industrial center of town in the early part of 1890. Rumford is also the birthplace of Senator Edmund S. Muskie. Mexico, Rumford's "Twin City," lies across the Androscoggin. Politically and economically, the two communities are so closely tied together that they are often referred to as Rumford-Mexico.

Leaving Rumford-Mexico and taking a circuitous route via Route 17 to Andover, one gets the feeling of civilization thinning out—the postage-stamp size of the towns, the narrow

attraction for geologists, rock collectors and photographers. A tiny, one-room schoolhouse stands almost as an outpost across the road from the Swift River Gorge.

Minutes north of Byron an unimproved road angles westward around the base of Old Blue Mountain through lumber country to Ellis Pond and on to Andover. (Ed. note. This road is not recommended for the sightseer or tourist.) Ellis Pond, also reached by paved road from Andover, has to be one of the most tranquil settings in Maine. It is a recreation area complete with sandy beach and cottages and water so glass-like that the photographer can usually catch the reflection of the commanding Old Blue Mountain in it.

Many other points of interest to the amateur explorer abound in Oxford County but neither time nor space allow for their inclusion in this story: the Devil's Staircase, a mountainside rock formation in Center Lovell; Horseshoe Falls with its waterworn hole in the rocks shaped like a king-sized horseshoe at Newry; the stock-car racing track in Oxford; superb hunting and fishing in the vicinity of Upton along the New Hampshire frontier; and, not to be overlooked, COMSAT's earth station at Andover.

Andover Earth Station, as is the case with the other COMSAT-operated stations, is located in what is characterized as a quiet "radio valley." A look on a map of Maine shows its location to be in what might be considered a remote area, again, usually characteristic of earth station locations. But, as in the case of Andover, these locations are steeped in history or abound in geographic attractions requiring a bit of the explorer and the willingness to travel short distances to uncover. Oxford County offers both and the friendliness and hospitality of its people make such discoveries all the more delightful.

*(Continued from page 2)*

Brazil; Fucino, Italy; Zamengoe, Cameroon; Carnarvon, Australia, and Paumalu, Hawaii.

Although the greatest volume of traffic through Andover involves telephony and television, new communications uses are emerging that were not heretofore considered practical. Computers are talking business to other computers across oceans at rates of 50,000 words a minute—about 16 times conventional transmission rates. This opens the door to linking information storage and retrieval centers via satellite which

## 10 years with COMSAT

*Appearing on this and the next page are Andover Station personnel who have celebrated ten years of service with COMSAT.*

between the U.S. and overseas points. And more than 3,000 physicians, assembled in 14 cities in the United States, France, Germany and Austria, have participated in a medical conference through closed-circuit TV and a two-way radio hookup.

In the field of world events Andover continues to perform as the purveyor of history. Only a short time ago the Andover station, along with



*Andover technicians are almost lost to view as they work approximately 70 feet above the ground on the power panels of the 12-story-tall antenna structure.*

could make libraries of one country available to scientists and scholars in other countries.

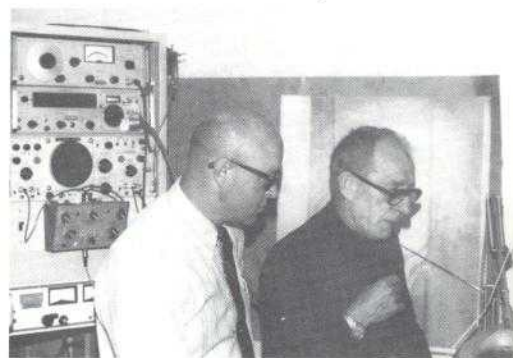
Facsimiles of electrocardiograms have been exchanged between countries via satellite, permitting physicians to diagnose heart ailments and recommend treatment. Customs clearance has been arranged for all passengers on a transoceanic airline flight by sending the necessary information ahead by satellite in the form of high-speed data. The potential of picture phone transmissions by satellite has been demonstrated

its sister station at Etam, West Virginia, brought the visit of Egyptian President Sadat to Israel into the homes of American television viewers. And again, during Sadat's visit to the United States, Andover served as the conduit through which the historic event was channeled to a worldwide audience.

Andover has played a leading role in the development of commercial satellite communications as well as in the reporting of history. It can be safely predicted that it will play an equally important role in the future. ●



*Jim Warren  
Station Manager*



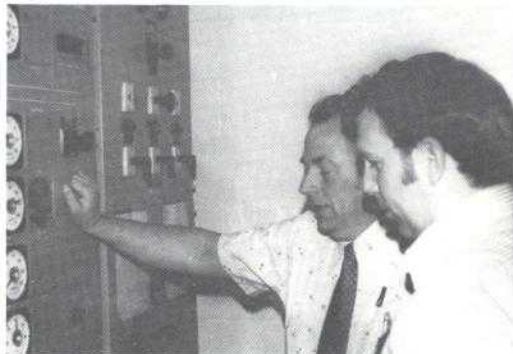
*R. "Sven" Engblom  
Electronics Supervisor*

*Dave Berry  
Senior Technician*



*Ralph Summerton  
Station Engineer*

*Art Haseltine  
Senior Technician*



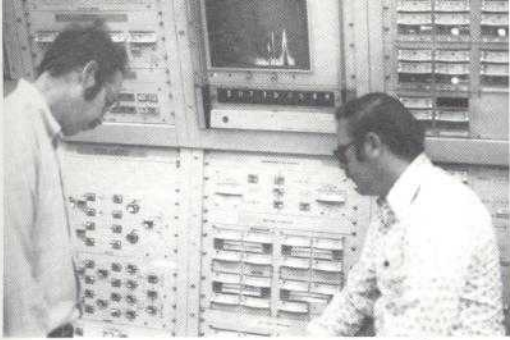
*Ken Dixon  
Operations Supervisor*

*Jack Conner  
Senior Technician*

*Bill Merrill  
Senior Technician*

*Charlie Jaros  
Technician*



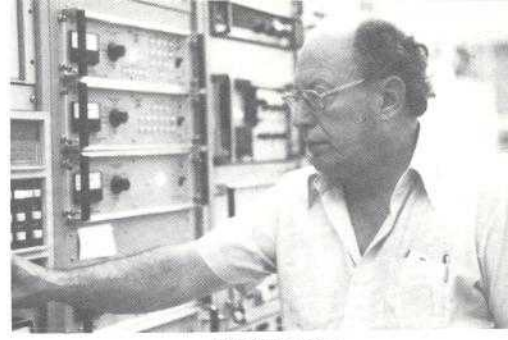


*Dan Grenier  
Senior Technician*

*Bruce Simmons  
Senior Technician*



*K. "Bill" Nuppula  
Senior Facilities Mechanic*

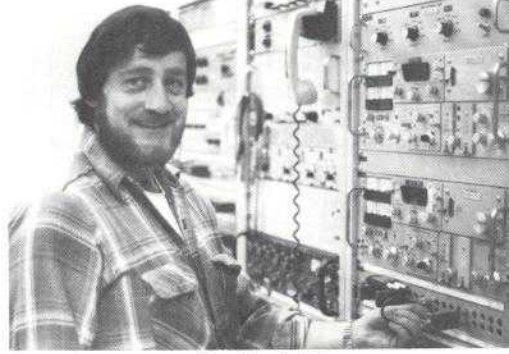


*Hal Frazier  
Senior Technician*



*Joanne Witas  
Material Controller*

*Shaun Arness  
Acting Administrator*



*Don Bachelder  
Senior Technician*



*Chuck Lepage  
TT&C Supervisor*



*Jim Fogg  
Operations Supervisor*



*Stan Morse  
Senior Technician*



*Jerry Bragdon  
Senior Technician*



*Dick Plantier  
Senior Technician*

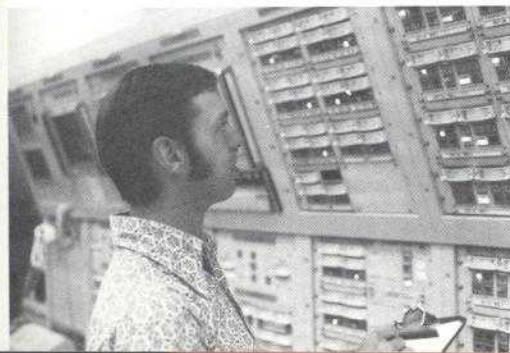


*Don Verrill  
Operations Supervisor*



*Ron Wells  
Senior Facilities Mechanic*

*G. "Jerry" Michaud  
Senior Technician*



*C. "Neil" Merrill  
Facilities Supervisor*      *Al Briggs  
Senior Facilities Mechanic*



*Davie White  
Senior Facilities Mechanic*





# NOTES FROM PERSONNEL

Since the distribution of the Employee Handbook many employees are taking a new look at their benefits. Attached to each paycheck is a Statement of Earnings and Deductions and it is recommended that each employee periodically examine

this statement to make certain the appropriate deductions are being made.

In order to properly understand deductions employees should be familiar with the codes and symbols used in itemizing deductions. Appearing on

this page and the next is a reprint of Exhibit 11, SPI 70-200, "Basic Pay Policies," which lists the abbreviated description of deductions which may appear on individual statements.

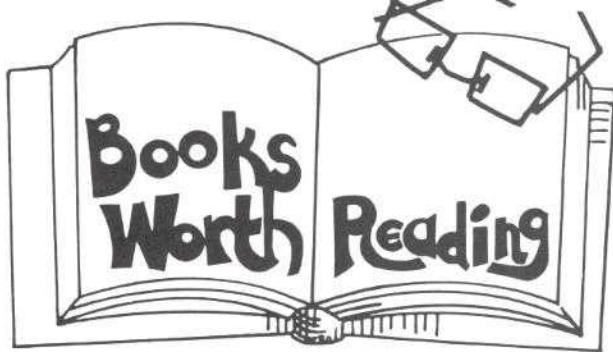
—Personnel Office

## DEDUCTIONS

Abbreviated Description Appearing On Statement Of Earnings And Deductions	Explanation  (Deductions Are Made Each Pay Period Unless Otherwise Indicated)	Starts Or Changes When:
ADVANCES	Salary or other advances	You obtain an advance and when the advance is cleared
BONDS MO	U.S. Savings Bond amount deducted only from the first paycheck of the month. Also see "US BONDS."	You submit a U.S. Government bond deduction form
CAL DIS	California disability tax	You are employed in California
CEA DUES	COMSAT Employees Association dues deducted annually	You submit a CEA dues deduction form
CU LOANS	Credit Union loan amount deducted until the Credit Union notifies Payroll that the loan is paid off	You obtain or complete repayment of a loan
CU SHARE	Credit Union shares	You authorize a deduction for shares
D DENTAL	Dependents' dental insurance coverage premium	You submit an Insurance Coverage & Benefits Summary form, CSC 866, to Personnel
D HEALTH	Dependents' health insurance coverage premium	You submit an Insurance Coverage & Benefits Summary form, CSC 866, to Personnel
FED W/TX	Federal income tax	You are hired or when you submit a revised government form W-4 to Payroll
F.I.C.A.	Social security tax deduction which is based on a percentage of a certain amount of your salary	You are hired and when the maximum for the year is reached
GARNISH	Garnishment of wages to satisfy an obligation	Court documents are received and when the garnishment is satisfied

## DEDUCTIONS

Abbreviated Description Appearing On Statement Of Earnings And Deductions	Explanation  (Deductions Are Made Each Pay Period Unless Otherwise Indicated)	Starts Or Changes When:
GRP LIFE	Group life insurance premium	You submit an Insurance Coverage & Benefits Summary form, CSC 866, to Personnel, or when your salary changes
HMO PLAN	Health Maintenance Organization Plan elected by employee in lieu of company's health plan.	You submit an Insurance Coverage & Benefit Summary Form, CSC 866, to Personnel
LOCAL TX	Withholding tax for jurisdictions other than federal or state	You are hired or submit a revised local tax form to Payroll
MISCELL	Miscellaneous one-time deduction not covered elsewhere in this chart	You authorize the deduction
MULT ADV	Miscellaneous multiple-period deduction not covered elsewhere in this chart	You authorize the deduction
NY DISAB	New York disability tax	You are employed in New York
PT DENTAL	Regular Part Time employees Dental Insurance Premium.	Personnel authorizes PT coverage and employee submits Insurance Coverage & Benefits Summary Form CSC 866, to Personnel.
PT LIFE	Regular Part Time employees life insurance premium.	Personnel authorizes PT coverage and employee submits Insurance Coverage & Benefits Summary Form CSC 866, to Personnel.
STATE TX	State withholding tax	You are hired or submit a revised state tax form to Payroll
TAX LEVY	Lien against an employees salary to cover federal or state taxes owed by the employee	Internal Revenue Service documents are received and when the lien is satisfied
TH & SAV	Thrift & Savings deduction	You submit the applicable Thrift & Savings form to Personnel or when your salary changes
UNIT WAY	Annual or periodic deduction for United Way	You submit a United Way pledge form to Payroll and when the pledge is satisfied
US BONDS	U.S. Savings Bond amount deducted each pay period. Also see "BONDS MO."	You submit a U.S. Government bond deduction form to Payroll
VOL AD&D	Voluntary accidental death and dismemberment coverage premium	You submit a Home Insurance Company Enrollment form to Personnel
VOL LIFE	Supplemental life insurance premium (Note: the premium changes automatically when you reach 25, 30, 35, 40, 45, 50, 55, and 60 years of age.)	You submit a Group Insurance Enrollment form, CSC 809, to Personnel or when your salary changes
WASH W/C	Washington State workmen's compensation	You are employed in the State of Washington



In the past few years the subject of women in management has generated controversy and concern among women and organizations. The following books are representative of the literature related to the subject and are available for loan from the Labs' Library.  
—Rosa Liu.

*The Ambitious Woman's Guide to a Successful Career*, Margaret V. Higgins and Thomas L. Quick, AMACON, 1975.

This is a "How To" book along classic lines. It is largely written from the conventional corporate point of view (interpret man's view). For many women, this book is very revealing in terms of what management is likely to be looking for. There are suggestions on how to assess yourself, your educational background and your potential. It discusses some educational resources outside of the standard university sources as well as other ways to groom yourself for a successful career. The chapter on "Success Determinants and Determinants" is very helpful for anyone not previously exposed to discussions on the specific problems of women in the working world. It is a book worth reading for those unfamiliar with the subject.  
—P. E. Ruddiman

*Assertive Training for Women*, Susan M. Osborn and Gloria G. Harris, Illinois, Charles C. Thomas, 1975.

This book is written primarily for a professional training group leader; however, a future participant will find it useful and informative. The history of assertive training groups, how the groups work, techniques used, and accomplishments are examined. Misconceptions and fears a woman may have of becoming more assertive are explored. Examples of how one can become more assertive are also provided. Although this book is directed towards a practicing professional, it is written on a nontechnical

level, making it easy to understand. I would recommend this reading to anyone interested in learning more about assertive training groups.  
—A. Speare

*Breakthrough: Women into Management*, Rosalind Loring and Theodora Wells, New York, Van Nostrand Reinhold, 1972.

This book is aimed at organizations developing Affirmative Action Plans, giving practical advice on recruiting, training and promoting women into management. It is also for women who are considering or are already in management; statistics showing salary and job level differentials are brought out as well as excerpts from the Revised Order No. 4 of the Affirmative Action Program. A chapter titled "Won't Women . . .?" explodes most of the conventional myths against hiring women for top level jobs. It is a well researched book and makes a very informative and pragmatic introduction to such topics as our sex-role culture, combining marriage and management, and working relationships that work. This book raises personal feelings and questions and elicits the reader to take a stand with a list of "Ask Yourself" questions at the end of each chapter. A list of information sources is given at the end of the book.  
—R. Liu

*Women in the Organization*, Harold H. Frank, University of Pennsylvania Press, 1977.

This book is designed primarily as a textbook. The first section is case histories of women in organizations.

These are real people with no happy endings. The second section is a series of readings pertinent to the cases. Many of the readings are "classic" articles on a particular facet of the women's movement. The articles are intelligent and interesting. Any woman considering or involved in a career would do well to look out for herself and take heed of the pitfalls described. The readings and cases are correlated in an appendix and the book can be accessed by reading a case study in the first section and then the appropriate readings in the second section. The "Statement of Purpose of the National Organization for Women" is very interesting and enlightening. It is amazing what interpretations can do to distort purposes such as these.

—P. E. Ruddiman

*The Women's Dress for Success Book*, John T. Molloy, Chicago, Follett Pub., Co, 1977.

This is the female version of the best selling *Dress For Success* (for men), Molloy's first book. Since its first appearance in October 1977, it has stirred a lot of heated pro and con comments among the women to whom it is addressed and among book reviewers. The thesis of "America's first wardrobe engineer" is that to succeed in the business world women need to create the right image—a "winner's work uniform" comparable to the men's dark three-piece suit. His book is based on 17 years of statistical data on how clothes make the person (he concedes that ability also helps). The successful woman always absolutely and positively wears the skirted suit with a hat and a wedding ring (even if not married).

This book brings up the lighter aspect of the changes caused by the women's movement. It is helpful in a sense that it makes one more conscious of the image one is projecting. It should be taken with a grain of salt; if taken too seriously it would kill all individual self-expression in clothing.  
—R. Liu

PATHWAYS



## Network Bits

### Field Correspondents

#### Andover

*Joanne Witas*

#### Brewster

*Dorothy Buckingham*

#### Cayey

*John Gonzalez*

#### Etam

*Bev Conner*

#### Jamesburg

*C.B. Marshall*

#### Labs

*Norma Broughman*

*Joan Prince*

*Blaine Shatzer*

#### M & S Center

*Darleen Jones*

#### New York

*Stephen Keller*

#### Paumalu

*Bob Kumasaka*

#### Plaza

*Gloria Lipfert*

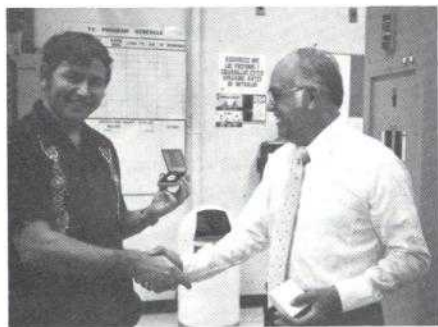
#### Santa Paula

*Pat Hogan*

#### Southbury

*Eileen Jacobsen*

**CAYEY.** The station has recently gone through a series of changes in configuration and, of course, many ssog tests. **Jimmie L. Payne** received his 10-year Service Award from Station Manager **L. R. Rodriguez** (photo below). **Arsenio Reyes** also received his 10-year award at a luncheon attended by station visitors **William B. Carroll**, **William Callaway** and **Paul Rankin**.



Visitors to the site included attendees at the ESOC Meeting held at the Cerromar Beach Hotel in Dorado. (Guess this goes with being rated "Numero Uno" out of 140 antennas.)

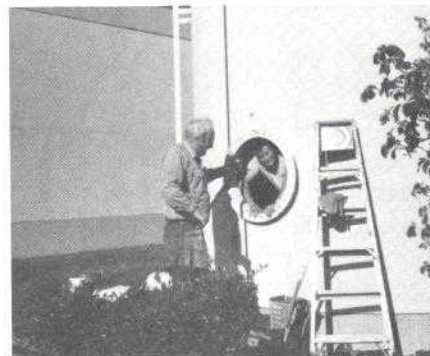
**P.J. McGranahan** receives a check for \$100 from COMSAT (photo below) as its 1978 contribution to the Cayey CEA. —**John J. Gonzalez**



**JAMESBURG.** **Don Fifield**, Director of U.S. Facilities, met with station employees during a recent visit here and presented a one-year Service Award to Facilities Mechanic **Leverne "Pete" Oliver** (photo below at left).



Following a drought and an abundance of rain, Facilities personnel cleaned out our 12,650-gallon water tanks. In the photo below, **Roy Scheiter**, left, and **Pete Oliver** clean out one of the two huge tanks.



**Larry C. Cisneros**, Team A Operations Supervisor, was temporarily assigned to Plaza Headquarters to assist U.S. Systems Operations in

developing operational procedures for the new COMSAT Operations Center.

**Allan Mayland** has joined the Electronics Technicians working with Team C. A resident of Carmel, Allan spent four years in the military, serving in communications.

Completing 10 years of service with COMSAT are Team Supervisors **Earl Jones** and **Jack Ramey**, Secretary/Personnel Clerk **Patricia Blatnik** and Station Administrator **Stan Nubin**.

Station Fire Marshal and Facilities Engineer **W. D. Robinson** took advantage of his five-year hydrostatic testing schedule to give on-the-job training in the use of portable fire extinguishers to station employees.



In the photo above, **Jack Ramey**, with **Allan Mayland** as backup, attacks the base of the flames caused by burning diesel fuel in a training tank. —**Cambrel Marshall**

**LABS.** **Ray Curtis** is anxiously waiting for the ice to thaw on the Indian River Inlet in Delaware in hopes of finding the string of fish he "lost." **John Rosso** of the COMSAT Ham Club made his first cw contact with Italy recently (his call letters are WD4OKF).

**Denis Curtin** has returned from a tour of London, Amsterdam and Munich following INTELSAT Solar Array discussions and U.K.-6 Module testing. **Ken Stuart**, **Bob Pritchard** and **Andy Lopatin** visited the West Coast for INTELSAT V evaluations.

**Hank Muller**, **Dave Perlmutter** and **Dirk Vanderloo** have retired from their CEA positions. We here at the Labs appreciate their past work on our behalf. **Dr. Charkraborty** has been elected a Senior Member of the

Institution of Electrical and Electronic Engineers.

**Paul Schrantz** attended meetings in France and witnessed the INTELSAT V Solar Array vibration test at IABG in Munich. **Al Ramos** spent two weeks in Munich for design review at the MBB plant. **Janet Glover** is now the full-time secretary for the Accounting Office.

Cashier **Betty Linthicum** had her long-time dream come true, a visit to Graceland in Memphis, Tennessee, the home of her idol Elvis Presley. Her only regret, that she didn't visit there during his lifetime.

**Hien Nguyen** has transferred from the equipment pool to the Component Testing Section of the R&QA Department. **Frank Sandel** transferred from the Meteorology Department to M&S Center.

Spacecraft Lab's **George Huson** attended the JANNAF Propulsion meeting at Lake Tahoe recently after which he visited the El Segundo office to discuss propulsion activities with **Bill Tolson**. **John Hsing** attended an INTELSAT contract kickoff meeting with MATRA in France.

The Labs Basketball Team ended its regular season with a 7-3 record and tied for second place in the Gaithersburg Super B League. A tie-breaker game was played between COMSAT and the Chinese Youth Club, coached by COMSAT's **Rocky Lee**, with COMSAT winning 81-62 after only a one point, half-time lead. COMSAT's team included **Pete Carlton**, **Kevin Grantham**, **George Meadows**, **John Reisenweber**, **Skip Stanton** and **Marvin Stanton**.

The snow-covered roadways have not kept **Andy (Crash) Brunk** from his vigorous training in preparation for this summer's auto demolition derby. The very promising watermelon patch in **Nelson Hyman's** office suddenly succumbed to what Nelson diagnosed as pococurante. "It's hereditary", he said.

**Chester** and **Nancy Wolejsza** took time out recently for a week's skiing and took to the slopes in Aspen, Colorado. **Joe Apple** was last reported bicycling through the croco-

dile-infested Florida Everglades (he is somewhat overdue). The **Vasil Uzunoglus** will be visiting family and touring Greece and the Mediterranean in June. **Bob Pritchard** has been spending his free time at ski lodges in Colorado and California. **Ralph Bowman** has been motorcycleing in the Daytona, Florida, area. We can expect movies and slide presentations upon his return.

**Robert Hefe** has recovered from surgery. **Steve Fry** is back at work after a few weeks in the hospital. **Dave Rogers** also underwent minor surgery but is now back with his department. **Marianne Merrihew** spent Christmas in the hospital but is now back with us.

**Kitty Mekhayarajjanan** has plans to be wed in July. **Carol Ecker** and **Fred Davis** were married in March and went to Florida on their honeymoon. Congratulations are in order for **Joan** and **Jim Prince** on the birth of their first child, daughter **Linda Elise**, weight seven pounds. The **Joe Kassers** have another daughter who weighed in at seven pounds, six ounces.

New employees at the Labs include, **Anita Goldstein**, **Donna Owen**, **Dr. Amir Zaghoul**, **Donald Balazik**, **Cynthia Cannon**, **James Burke**, **Glenda Morris**, **Janet Glover**, **Phyllis Book**, **Richard Lei**, **Shanti Gupta**, **Wayne Redman**, **Gloria Moore**, **Debbie Boxwell**, **Carol Ecker** and **John Castorina**. Joining the Labs from INTELSAT were **Masataka Akagawa** of Japan and **Roger Colby** of the United Kingdom. —B.P.S.

**M&S CENTER.** Vacationers are hitting the road early this year with **Barbara** and **Hugh Hutchens** spending time in Florida and **Lee Bolinger** visiting his mother in Tennessee. **Judy Ahalt** and **Bud Kennedy** recently underwent minor surgery.

**Frank Sandel** has joined the M&S staff as a member of the Calibration Team. He had been with the Calibration Standards Section of the Labs.

—Darleen Jones

**PAUMALU.** Newsworthy items for this issue are in rather short supply. There is some construction work going on, however, that will affect the outward appearance of the station. An eight-foot chain link security fence is being erected around the immediate operating and support area by the Honolulu-based Pacific Fence Company. Barring adverse weather conditions, the fence should be completed by the time this issue of the magazine is published.

In the photo below, Facilities Supervisor **Joe Chow** (right) observes contractor employees installing the fence. —Bob Kumasaka



**PLAZA.** **Terry Lowe** recently transferred to the Plaza and has joined the Celestial Mechanics working for **Carol Smith**. Terry had worked in the Computer Center at the Labs.

We heard recently from one of our retirees, **Bob Carl**. Initially, Bob had told us he was retiring to Arkansas. However, Bob says he decided to move his retirement plan across the border into Missouri. His retirement home is on Table Rock Lake in Blue Eye, Missouri, a few miles across the Arkansas State line.

Incidentally, it would probably be of interest to our readers if we carried a few lines whenever possible about happenings with retirees. If you hear from any of them, drop me a note and we'll see about mentioning them in this column. —Gloria Lipfert

**SOUTHBURY.** During the February "Blizzard of '78", the Southbury area experienced about two feet of snow with drifts as high as eight

feet or more. In many locations it was totally impossible to drive to and from the station and technicians and operators were stranded here to work abnormally long hours (several in excess of 24 hours and one technician as long as 43 hours) without relief.

Our Connecticut Governor, Ella Grasso, imposed a driving ban for two days after the storm which made it even more difficult to get shift relief into the station. At one point, a MARISAT telephone operator shift change was made possible only through the cooperation of the Southbury Volunteer Fire Department, ferrying operators via fire engine. The dedication of the station personnel in staying at the posts and maintaining TT&C and MARISAT service is something of which we feel the COMSAT family can be justifiably proud.

Station Manager **Alan Coburn** has been quite active on the speaker's circuit recently: the Heritage Village Men's and Women's Clubs; the University Club of Waterbury; the Pomperaug Valley Kiwanis Club; and the Kiwanis Club of Waterbury. As part of his presentation he has been showing the film "Via MARISAT", which is an excellent introduction to the MARISAT system and a popular subject of interest to people in our area.

We appreciate **Pat Lorenzo's** filling in on a part-time basis with clerical duties, and give special thanks to her husband **John** for providing CPR training to station employees. **Connie Sarles**, MARISAT Operator, is becoming an expert auto mechanic, repairing her Mercedes every other couple of days. However, this did convince her to look for a later model.

**Roger Miner** and **Scott Ackland** have been spending their spare time (after work and school) completing flying lessons. **Richard Vasko** organized a ski party at the Woodbury Ski and Racquet Club. Following the February snowfall the skiing conditions were excellent. We all ended up at his house for refreshments. **Gary Firtick** finally had the brace removed from his fractured shoulder just in time to move into his new home.

—Eileen Jacobsen

## May 15 deadline for 1978 graduates

As in previous years, PATHWAYS will again carry a listing with pictures of the 1978 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, PATHWAYS, **no later than May 15.**

Photographs may be 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.

## At Presstime

### Postal Service/COMSAT to test message service by satellite

The United States Postal Service has unveiled plans to test an international electronic message service utilizing satellites to transmit messages between the United States and overseas locations. The program will be in cooperation with COMSAT and would involve five or six other nations.

The contract signed by the Postal Service and COMSAT calls for development of an international electronic message service system and a one-month operational demonstration, according to Postmaster General William F. Bolger. It also includes joint Postal Service-COMSAT planning for a proposed field trial of a pilot system. A decision on whether to proceed with the field trial will be made before the expiration of the contract.

The system envisaged will scan the original mail document provided by the sender and convert this information into digital electrical signals. By means of ter-

restrial and satellite communication links the signals will be transmitted to receiving earth stations in overseas locations. There, a facsimile copy will be made (providing an exact duplicate of the original document) and delivered to the addressee through the traditional mail systems in those countries. New York and Washington are being considered as the sites for the U.S. transmission points.

The contract signed by the Postal Service and COMSAT sets a ceiling of \$895,000 and covers the costs for the project through the one-month demonstration phase and up to the scheduled field trial to begin in about a year and to last for approximately one year.

The one-month demonstration—projected to take place in February 1979—will not use actual mail. Demonstration material from businesses and government will be solicited for handling and transmission in this phase.

### Last of IV-A satellites launched successfully

The sixth and last of the INTELSAT IV-As was launched successfully from Cape Canaveral Friday, March 31, and placed in synchronous orbit on Saturday.

The satellite is planned for final positioning at 63° E. Longitude where it will serve some 40 countries in the Indian

Ocean Region. Countries in this region are presently being served by an INTELSAT IV which will be relocated over the Pacific Ocean. The INTELSAT IV-A launched in January 1978, and positioned over the Indian Ocean, will serve as a back-up to the new satellite.

# Pathways

SATELLITE

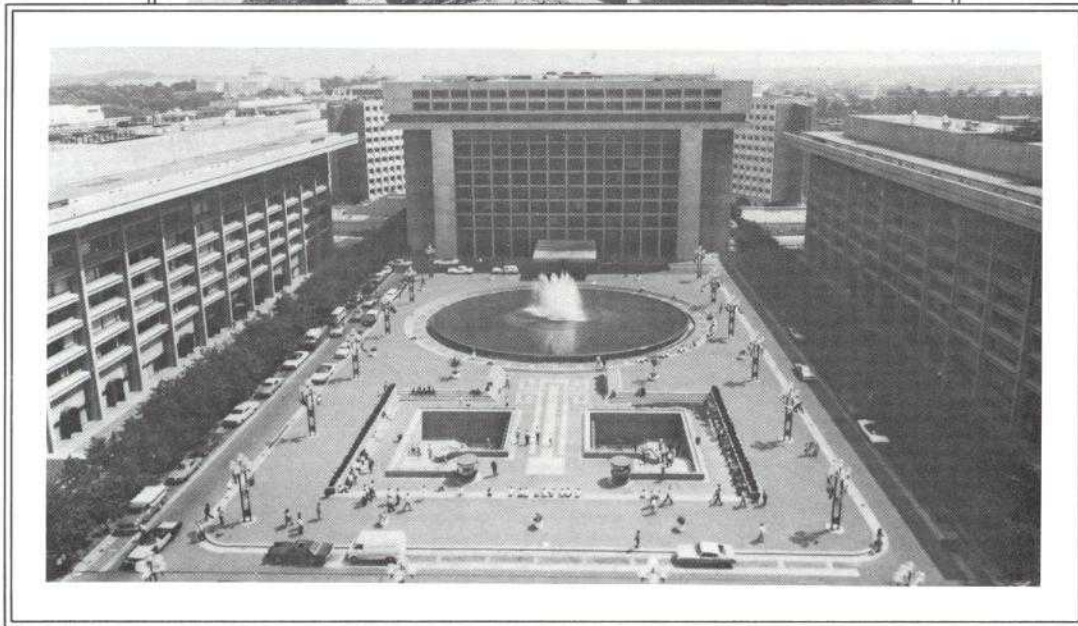
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# Pathways

SATELLITE

May-June 1978  
Volume 3 Number 3

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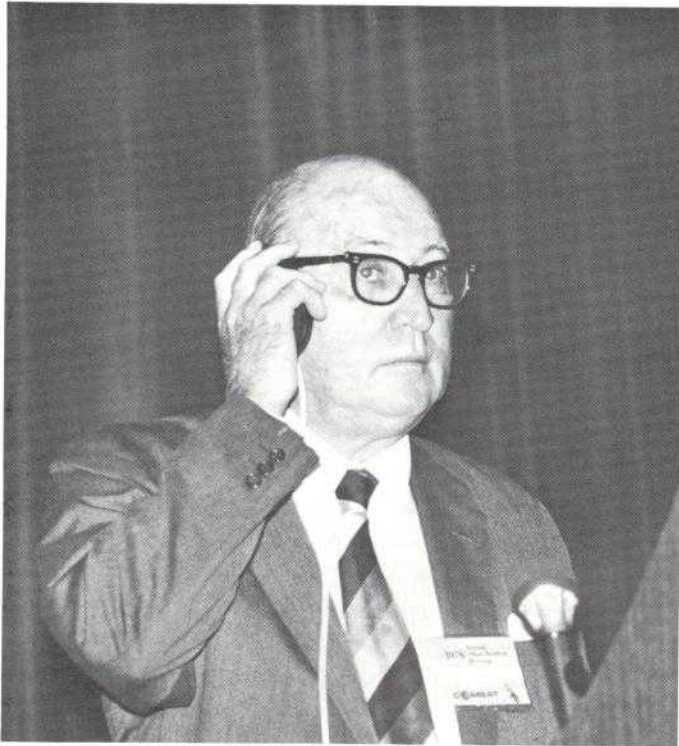
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CORPORATION 1978

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*Cover. Ten years ago, COMSAT moved into its new Headquarters Building at L'Enfant Plaza. The photographs on the cover depict the development of the Plaza Headquarters site.*



*Joseph H. McConnell*

**R**EPORT OF THE CHAIRMAN. I am pleased to report that 1977 was marked by continued growth in our services—through both the parent company and our COMSAT GENERAL subsidiary.

- At the end of the year we were leasing to our customers through the INTELSAT system about 19 percent more half-circuits than at the end of 1976.

- Chiefly through the COMSTAR and MARISAT programs, COMSAT GENERAL's operating revenues more than doubled—from \$28.5 million for 1976 to \$61.5 million for 1977. As a result, there was more than a fourfold increase in COMSAT GENERAL's contribution to Net Income—from 16 cents per share for 1976 to 65 cents per share for 1977.

- Our total operating revenues reached an all-time high of \$168.2 million in 1977. And our earnings for the year would have exceeded those for 1976 had it not been for the FCC rate case concerning our services through the INTELSAT system.

Pending the outcome of the rate case, in 1977 we had to put about \$38 million more revenue in escrow than in 1976. As a result, our 1977 Net Income was reduced to

*(Continued on next page)*

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## 15th Annual Meeting of Shareholders

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*Joseph V. Charyk*



**R**EPORT OF THE PRESIDENT. The Chairman has already referred to the growth in our services through the INTELSAT system and the growth in COMSAT GENERAL's revenues and contribution to earnings—principally through the MARISAT and COMSTAR programs.

Our operations through the INTELSAT system continue to represent the most important element of our business—accounting for about 58 percent of our total operating revenues in 1977.

By the end of 1977, we were leasing more than 5,300 half-circuits to our customers and, through the seven U.S. earth stations operating in the INTELSAT system, we were placing the American public in communication with the people of 96 other countries—four more than at the end of 1976.

While COMSAT's traffic through the INTELSAT system increased 19 percent, traffic through the INTELSAT system as a whole increased 22 percent during 1977 as INTELSAT membership rose to 102 countries and more countries initiated or increased their use of the system.

In addition to meeting the growing demand for inter-

*(Continued on next page)*



*Chairman's Report prompts a query*

#### **McCONNELL**

\$3.27 per share, down from \$3.83 per share for 1976.

In February we announced that an agreement had been reached with representatives of the staff of the FCC on a proposed settlement of the rate case—subject to the approval of the Commission itself. Since then, we have been waiting for the Commission to act on it.

This morning the Commission met to consider the settlement proposal, and we have been informed that it has approved it. We are pleased with the news, and we are happy that the Commission acted in time for us to announce it at this meeting.

The terms of settlement were described in great detail in our Annual Report to the Shareholders, and I will not burden you with a detailed restatement of them here.

But the most significant aspect of the settlement to us is the provision it makes for our future rates for INTELSAT system services.

You will recall that in its 1975 decision the FCC disallowed more than half of our proposed rate base and prescribed a lower rate of return than we had sought. On our appeal to the Federal Court of Appeals in Washington, the Court upheld the FCC's decision in major respects but gave us some relief on certain of the issues involved in the case.

#### **CHARYK**

national telecommunications services, INTELSAT increasingly is helping various countries satisfy their domestic communications needs. Today, 12 countries, including such diverse nations as Algeria, Brazil, Malaysia, Nigeria and Saudi Arabia, are leasing INTELSAT satellite capacity for this purpose.

By the end of 1977, the worldwide network of earth stations operating in the INTELSAT system comprised 201 antennas at 163 stations in 88 countries. There were 558 satellite pathways providing direct lines of communication among countries with earth stations—64 more pathways than at the end of 1976. And 122 countries, territories and possessions were using satellite services full time, either directly or through terrestrial connections with countries having earth stations.

To keep pace with the escalating, world-wide demand for communications services, INTELSAT is continually taking steps to augment its satellite capacity. At the end of March, INTELSAT launched the last in the series of INTELSAT IV-A satellites. Five of these satellites, each with a capacity to provide 6,000 voice-grade circuits and two television channels, will join with satellites of the INTELSAT IV series in providing global service until satellites of the INTELSAT V series are ready for service.

The first of the INTELSAT V satellites, now under man-

ufacture by an international team headed by Ford Aerospace & Communications Corporation, is slated for launch during the latter part of 1979. Each will have a capacity of 12,000 circuits plus two television channels, or double the capacity of an INTELSAT IV-A. The INTELSAT V's will introduce a number of important technological innovations in the INTELSAT system of the 1980's, including a new three-axis satellite stabilization system, the use of higher frequency bands, techniques for more efficient use of frequencies, and techniques for the generation of greater satellite power.

Through its operational and technical expertise and through research and development work at COMSAT Laboratories, COMSAT has played a central role in the establishment and advancement of the INTELSAT system. Our current Management Services Contract will expire in February 1979, and it is only natural that as the INTELSAT organization and system mature, more of the work involved in operating and managing the system will be carried on within the organization itself. Thus, after the expiration of the Management Services Contract, most operational tasks and certain technical functions of INTELSAT will be performed by INTELSAT's own staff. The remaining technical functions and certain specialized operational tasks are to be carried out by COMSAT for IN-

The settlement gives us the benefit of the improvements we achieved upon our petition for judicial review as well as some other adjustments.

Naturally, the settlement embodies compromises. It does not allow us some of the elements we sought to have included in our rate base or the rate of return we had sought. But it does entitle us to establish rates higher than those that would have been required by the FCC's 1975 decision without modification.

We believe that the settlement is in the best interests of the Corporation as well as the customers for international communications services. It is an improvement over the FCC's original decision. We have been involved in the rate case for more than a decade. And by putting it behind us on the terms of the settlement, we now will be able to move forward in the development of our business with less uncertainty and distraction.

Last month we reported earnings for the first quarter of 1978 based on the rates for INTELSAT services that will

be established pursuant to the settlement of the rate case. Although these rates are higher than those that would have been required by the FCC's 1975 rate decision, they are lower than the rates upon which our revenue from INTELSAT services was calculated for the first quarter of 1977. The new rates were set lower to compensate for the substantial increase over the past year in the volume of our INTELSAT system traffic.

Despite the use of lower rates in the calculation of our first quarter 1978 income, revenue from our INTELSAT services for the quarter approximated revenue from INTELSAT services for the first quarter a year ago because of the nearly 20 percent increase in our INTELSAT system traffic.

And with growth in our MARISAT system revenue, both Total Operating Revenues and Net Operating Income for the first quarter of 1978 exceeded those for the first quarter a year ago, even though Net Income de-

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*COMSAT's President reports to shareholders*

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TELSAT's Director General under contract with INTELSAT. Accordingly, the Corporation will continue to have a significant, though substantially reduced, role in the management of the space segment of the INTELSAT system.

COMSAT GENERAL'S MARISAT and COMSTAR operations represent the second most important element of our business. Together they accounted for about 36 percent of our total operating revenues in 1977.

The MARISAT system has been providing maritime communications satellite services to the U.S. Navy and to the commercial shipping and offshore industries since mid-1976. The space segment of the system consists of three satellites, one each over the Atlantic, Indian and Pacific Ocean regions. The system has been providing global service to the Navy since January 1, 1977, when the Indian Ocean satellite was placed in service. But service to commercial customers has been limited to the Atlantic, Pacific and western Indian Ocean regions because there has been no commercial MARISAT earth station within sight of the Indian Ocean satellite.

In major developments last year, the Navy agreed,

subject to certain termination rights, to extend its use of the three MARISAT satellites to a period of five years ending in 1981 when it is expected that the satellites will need to be replaced. And an agreement was reached with the Japanese international telecommunications carrier—KDD—to achieve global service capability for commercial customers. The MARISAT joint venture will lease satellite capacity to KDD which in turn will provide Indian Ocean MARISAT service through an earth station in Japan.

More than 100 commercial ships and offshore oil drilling facilities are now equipped with MARISAT terminals, nearly three times the number so equipped a year ago. And although COMSAT GENERAL's revenue from commercial MARISAT service represents a relatively small part of its total revenue from MARISAT operations, it has been growing at a dramatic rate. A year ago, COMSAT GENERAL's commercial MARISAT revenue totaled less than \$100,000 per month, but now it is totaling more than \$300,000 per month.

Eventually, maritime satellite services are likely to be

*(Continued on next page)*





*A temporary interruption of the meeting*

#### **CHARYK**

provided through an international system to be operated by a new international organization, INMARSAT, the International Maritime Satellite Organization. Agreements for INMARSAT currently are open for signature by interested countries.

Our government has not yet designated a U.S. participant for INMARSAT. Recently, both the Committee on Interstate and Foreign Commerce and the Committee on Merchant Marine and Fisheries of the House of Representatives reported out a bill designating COMSAT as the U.S. participant.

*(Editor's note. On May 15 the House passed this bill 350 to 0.)*

We expect that INMARSAT system satellites would not be in service before the mid-1980's. Thus, unless some other means can be found to continue maritime service beyond the projected end of the service lives of the current MARISAT satellites in 1981, it is possible that a service gap would exist until the INMARSAT system were established. We are actively exploring various possibilities for filling the potential service gap.

In the COMSTAR program, COMSAT GENERAL has leased the capacity of three satellites to AT&T for domestic communications purposes for a period of seven years each. Two of the satellites have been in service since mid-

#### **McCONNELL**

clined. Most of the apparent decline resulted from an adjustment in the first quarter of 1977 for retroactive accounting changes.

In terms of Net Income Per Share, first quarter 1978 Net Income of 97 cents per share was one cent per share below the outcome for the first quarter of 1977 when the Corporation had 2,000,000 more shares outstanding than it does today.

At the last Annual Meeting, I discussed the payment of dividends. I mentioned that we were proceeding cautiously because of a number of uncertainties, including those relating to the rate case. During the year, as we moved nearer a resolution of some of these uncertainties, our Board of Directors found itself in a better position to raise the dividend level. Accordingly, the quarterly dividend rate was increased twice since the last Annual Meeting, so that it is now 50 cents per share—double what it was a year ago.

In another action taken during the year, the Corporation purchased 2,000,000 of the 10,000,014 shares of its Common Stock that had been outstanding. The purchase was an appropriate step in the light of our strong cash position. It has had a favorable effect on our earnings per share and book value per share. And should we ever desire to use stock to help us carry out an acquisition, the stock purchased will be available for that purpose.

1976, and the third is scheduled for launch in June. If the launch is successful and the satellite operates satisfactorily, revenues for the last half of 1978 and succeeding years will be increased by \$1.3 million per month—the rate applicable to the lease of each satellite in the program. An unsuccessful launch or a failure of the satellite to operate satisfactorily in orbit would require COMSAT GENERAL to launch a spare satellite at additional cost and would cause a delay in the receipt of additional lease payments in the program.

COMSAT GENERAL also carries out a worldwide technical services program that involves a broad range of telecommunications management and engineering activities. About 40 of the countries with INTELSAT systems earth stations have used these services. And this year, the Arab Satellite Communications Organization selected COMSAT GENERAL to provide comprehensive consulting services for the establishment of an Arab regional satellite system. The total value of the contract, signed on April 15, will range as high as \$20 million depending on the services that eventually will be required.

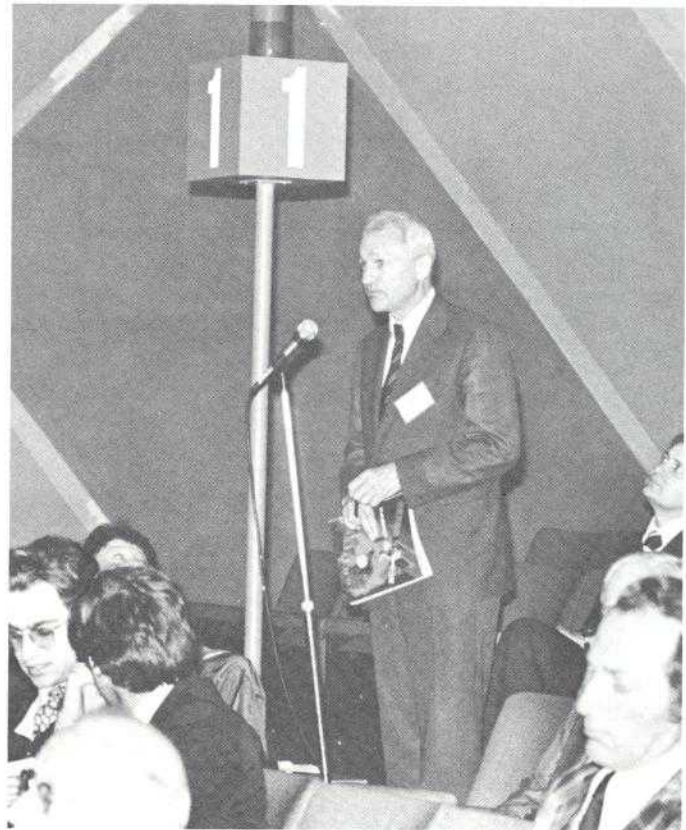
The Chairman noted that the Corporation has reached a level of maturity in its major programs. This is because communication by satellite is now an established and proven technology—attributable in large measure to our

This year we are celebrating our fifteenth anniversary, and the Corporation has now reached a level of maturity in its operations that makes expansion of its business activities a natural course to follow. The expansion could come from internal growth or through business acquisitions.

The Corporation generates substantial amounts of cash. And because it currently has no long-term debt, potential additional sources of capital are available to it. Therefore, we are in an excellent position to take advantage of new business opportunities. And increasingly we are directing our attention in this direction.

In his report, Dr. Charyk will review the status of our current programs and some of the new projects being undertaken. But before I conclude my remarks, I want to report to you on one of our most ambitious projects—Satellite Business Systems, perhaps better known as SBS—the partnership formed by subsidiaries of COMSAT GENERAL, IBM and Aetna Life & Casualty.

During the past year, SBS moved significantly closer toward the establishment of its domestic satellite system. Through the most advanced technology, the SBS system will be able to furnish large organizations with highly flexible and versatile networks to meet their complex internal communications needs. The SBS system will not only  
*(Concluded on next page)*



*A shareholder asks a question*

achievements during the past 15 years. We have a solid technological base from which to draw in devising new systems and establishing new services to meet the emerging requirements of the future.

But increasingly we find that our ability to convert our technology into viable programs and to continue the forward movement of our business depends not only on the readiness of the technology itself. It depends as much on industry organization and relationships and the vagaries of governmental policy-making and regulation.

I referred earlier to the growth and development of the INTELSAT organization and the increasing use of the system by other countries for international and domestic communications purposes. As INTELSAT grows and changes we can expect corresponding changes in our role in the organization and in our use of the system relative to that of other countries. With the emergence and growth of a permanent INTELSAT staff, our management role is diminishing. And with increased use of the system by other countries for communications that neither originate nor terminate in this country, we can expect a continuation in the decline of our investment share and voting power in the organization.

On the other hand, if the government were to adopt and maintain policies that foster greater use of the system by

this country, the U.S. position would erode less or be sustained.

For example, last year, after issuing a series of decisions authorizing greater use of existing undersea cables for transatlantic communications, the FCC turned down a proposal by the other U.S. international carriers for construction of a new 4,000-circuit cable, known as TAT-7, for service between the U.S. and Europe beginning in 1981. The FCC found that other facilities, including the forthcoming INTELSAT V series of satellites, would be sufficient to meet even the highest projection of traffic through 1985 and would require less overall capital investment and lower charges to the public than would the proposed TAT-7 cable. A request by the carriers for reconsideration of the decision, which is being supported by certain U.S. Government agencies as well as by a number of European telecommunications administrations, is pending before the FCC.

In another development that may signal a change in our relationships with the ultimate recipients of some of our services, the Spanish International Television Network has petitioned the FCC to allow television broadcasters to deal directly with COMSAT in procuring television transmission service through the INTELSAT sys-

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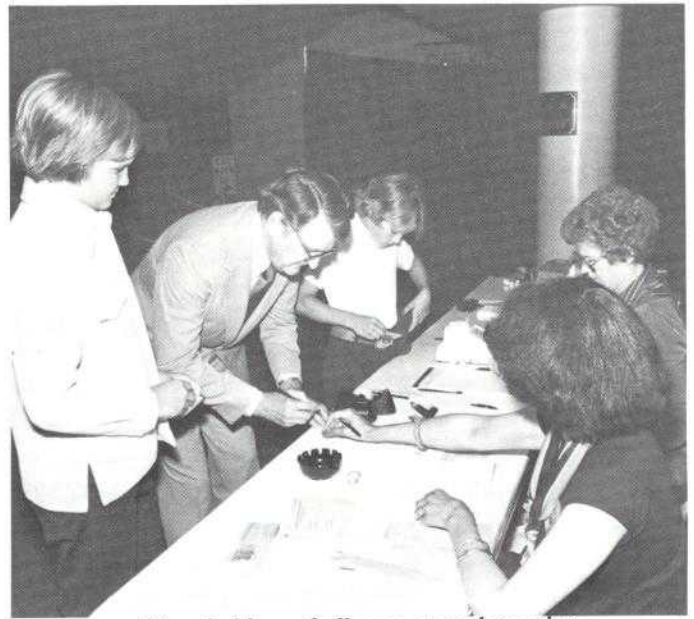
## McCONNELL

be able to meet a customer's conventional telephone and message communications requirements, it will also be able to meet various new requirements such as rapid data transmission.


In 1977, the FCC authorized construction of satellites and related facilities for the SBS system. And even though the FCC's authorization is under appeal by various parties, including the Department of Justice, SBS is proceeding with the preoperational phase of its program. I might mention that even the Department of Justice is not asking that the SBS venture be stopped, but is only raising procedurally some antitrust questions.

In January of this year, SBS awarded a \$63 million contract to Hughes Aircraft Company for three satellites, one of which is to be an on-the-ground spare. The first launch is planned for 1980, with full commercial operation scheduled to begin in 1981.

Of course, it will be some time before we may expect such an ambitious program to become profitable. And SBS will be operating in a highly competitive business environment. But we view SBS as a most exciting and promising venture, and we are particularly pleased to be associated in it with such other distinguished companies as IBM and Aetna.



*Shareholders of all ages attend meeting*

As we proceed to expand our current programs and to seize upon new opportunities, we undoubtedly will encounter numerous challenges. But with our excellent staff and substantial technical and financial resources, I am confident that we can and will meet those challenges successfully. 

## CHARYK

tem. Under the FCC's authorized users policy, COMSAT is barred from providing service directly to the ultimate customer. Thus, since 1965, the FCC has required the broadcasters to procure the television service indirectly, through other carriers, under a rotating procedure known as the carrier-of-the-week arrangement. This arrangement has been costly and cumbersome to the broadcasters, and they maintain that it has restricted their use of satellites for television distribution. Accordingly, we are supporting the Spanish Network's petition before the FCC.


As is true in many other sectors of our national economy, the communications industry is going through a period of rapid change. In this changing environment there are both challenges and opportunities, and we are constantly searching for new and profitable ways to apply and market our technology.

We are justly proud of the achievements of COMSAT Laboratories. The Laboratories stand at the leading edge of the communications satellite technology and have developed components and systems that may be ripe for profitable commercial exploitation. For example, we are now exploring the prospects for manufacturing and marketing various Labs-developed products. These include

an echo-cancelling device developed under COMSAT and INTELSAT research and development programs and an antenna feed system developed under the COMSAT research and development program.

Since October of last year, COMSAT GENERAL has been participating with the U.S. Geological Survey and Telesat Canada in a developmental program to demonstrate the use of satellites and small, unattended earth stations for the collection of data on water resources from remote areas of the U.S. and Canada.

In March of this year, COMSAT entered into an agreement with the U.S. Postal Service to assist the Service in developing and demonstrating an international electronic message system, and in planning a possible one-year field trial of a pilot system. The system would employ COMSAT-operated U.S. earth stations and INTELSAT satellites to send mail electronically between this country and a number of locations overseas.

These projects are examples of the kind of exploration we can expect to see more of in the years ahead. This will be a period of experimentation as new services are proposed and tested to determine whether they will prove economically feasible. 

## Shareholders elect directors

COMSAT shareholders elected 12 directors at their Fifteenth Annual Meeting on Tuesday, May 9, in Washington, D.C.

The elected directors are Joseph V. Charyk (President of COMSAT), Gordon Edwards, William W. Hagerty, John D. Harper, John A. Johnson, Melvin R. Laird, Joseph H. McConnell (Chairman of the COMSAT Board of Directors), Howard J. Morgens, Ellmore C. Patterson, Charles J. Pilliod, Jr., Bruce G. Sundlun and William L. Zimmer III.

Eleven of the twelve directors were previously serving on the board. The new director is Mr. Patterson who is Chairman of the Executive Committee and a director of J. P. Morgan & Co. Incorporated and of its wholly owned subsidiary, Morgan Guaranty Trust Company of New York. He succeeds Rudolph A. Peterson who retired from the board after nine years of service.

Shareholders also reappointed the firm of Deloitte Haskins & Sells to serve as the Corporation's independent public accountants for 1978, and rejected a shareholder's proposal for the provision of information concerning previous government service, if any, of certain persons serving the Corporation.

### *Rudolph A. Peterson Retires as COMSAT Director*



MAY-JUNE 1978

## Patterson joins COMSAT Board

Ellmore C. Patterson is chairman of the executive committee of J. P. Morgan & Co. Incorporated and of its wholly owned subsidiary, Morgan Guaranty Trust Company of New York. He assumed those positions January 1, 1978, after serving as chairman of the board and chief executive officer of both companies since August 1971.

Mr. Patterson was born in West Sprints, Illinois, November 19, 1913. He was graduated in 1935 with a Bachelor of Science degree from the University of Chicago, where he was captain of the football team in his senior year. Later that year he joined J. P. Morgan & Company.

As a U.S. Navy officer during World War II, he was active in anti-submarine warfare aboard a destroyer escort in the Pacific. He left the Navy as a lieutenant commander in 1946, returning to the Morgan bank shortly afterward. He was elected an assistant vice president in 1948 and a vice president three years later.

When Morgan Guaranty was formed in 1959 by the merger of Morgan bank and Guaranty Trust Company of New York, Mr. Patterson was named a senior vice president, heading the general banking division. He became an executive vice president in 1962. In 1965 he was elected a director and vice chairman of the board. He was named chairman of the executive committee in 1967. He became president of the bank at the beginning of 1969. When J. P. Morgan & Co. Incorporated was formed as a holding company to acquire Morgan Guaranty in April 1969, he was also elected president and a director of the holding company. He became chairman of the board and chief executive of both companies on August 1, 1971.

Mr. Patterson is a director of Bethlehem Steel Corporation, Canada Life Assurance Company, General Motors Corporation, Santa Fe Industries, Incorporated, Schlum-



*Ellmore C. Patterson*

berger Limited, and Standard Brands Incorporated.

In December 1976 he was elected to a three-year term as a Class A director of the Federal Reserve Bank of New York. He has been a member of the Federal Advisory Council of the Federal Reserve System during 1975 and 1976.

Mr. Patterson was a member of the President's Commission on Financial Structure and Regulation, known informally as the "Hunt Commission," appointed in 1970 to study the nation's financial system and to make recommendations for improving it.

He served as Chairman of the Advisory Committee on Commercial Bank Supervision appointed in 1965 by the New York State Superintendent of Banks. The Committee made recommendations—most of which have been put into effect—for changes in both regulation and legislation affecting banks chartered by the State of New York.

He is a trustee of the University of Chicago, the Alfred P. Sloan Foundation, Memorial Sloan-Kettering Cancer Center, and a member of the Corporation of the Massachusetts Institute of Technology.

# INTELSAT Board approves TTC&M contracts with COMSAT and five other signatories

The Thirty-second Meeting of the INTELSAT Board of Governors was held March 29—April 5, 1978, at INTELSAT Headquarters. Twenty-five Governors, representing 76 of the 101 Signatories were present for all or part of the meeting. Among its actions the Board:

## Organizational and Administrative Matters

- Approved staffing requests for the Planning and Engineering Divisions of the Operations and Development Directorate proposed by the Director General to the extent of 75 percent of the professional staff requested by the Director General and such general services staff as is correspondingly appropriate; and approved professional staff for those areas of the Engineering Division involving a transfer of functions presently performed by the Management Services Contractor, at the level proposed by the Director General.
- Approved INTELSAT's participation in the TELECOM 79 exhibition, to be held in conjunction with the 1979 World Administrative Radio Conference in Geneva, Switzerland.

## Technical and Operational Matters

- Authorized the Director General: to execute agreements with the Signatories of the U.S., Australia, Cameroon, Italy, France and Japan for TTC&M and TTC&M/In Orbit Test facilities and services for the period January 1980 through 1984; to exercise options for the U.S. and Italian Signatories to provide existing TTC&M facilities for emergency backup during 1980; and to invite EM-BRATTEL (Brazil) and ENTEL (Chile) to submit a final proposal, including a new antenna consistent with the specification, for TTC&M services in the Southwest Atlantic Region.
- Approved the INTELSAT v CSM program plan consisting principally of the design, procurement, installation and testing of eleven sets of new CSM equipment at an estimated cost of \$15 million; and noted that a sole source contract with COMSAT will be necessary after February 12, 1979, for completion of the CSM program implementation.
- Decided that INTELSAT should be represented at the next meeting of the proposed international maritime Joint Venture, in order for INTELSAT to present particulars concerning the alternatives currently under consideration by INTELSAT for the provision of maritime space segment capacity.
- Requested the Director General to transmit suggested revisions to Article 9A of the ITU Radio Regulations to INTELSAT Parties, Signatories and ITU Administrations for their consideration in preparing for the 1979 WARC, indicating in his transmittal letter that INTELSAT is continuing to study this matter and that the suggested revisions at this stage do not necessarily represent the views of INTELSAT Parties or Signatories.
- Requested the Director General to bring to the attention of the Parties, Signatories and INTELSAT Administrations that it would be desirable for a proposed modification to a draft CCIR recommendation for digital services to be given careful consideration in developing the national positions for the 1978 CCIR Plenary.
- Approved the Director General's outline of a study of long-term leases of space segment capacity. A final report and recommendations will be presented in September.
- Approved the proposed revisions to the 1.25 MHz/12-channel carrier filter specifications in the Standard A and C earth station performance characteristics.
- Approved three Brazilian and thirteen Zairian non-standard earth stations for access to INTELSAT IV and IV-A satellites for the purpose of providing domestic public telecommunications in conjunction with their respective leased space segment capacity; extended approval of a U.K. non-standard experimental earth station in the receive-only mode, without charge, for a period of one year commencing April 1, 1978, for cross-polarization experiments; and approved a U.K. non-standard earth station at Christmas Island.

## Legal and Financial Matters

- Requested the Director General to complete the development of an Accounting Procedures and Internal Control Manual; to prepare recommendations regarding the establishment of the post of Internal Auditor; and to develop an outline of a task system for Executive Organ budget and management purposes.
- Requested the BARC to review the financial aspects of the INTELSAT Retirement Plan.

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*The preceding report was prepared by  
Ellen D. Hoff, INTELSAT Affairs,  
International Operations Division*

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## MARISAT charges reduced

COMSAT GENERAL Corporation announced it has filed for a reduction in its charges for commercial telex services via the MARISAT satellite system from six dollars to four dollars per minute, effective August 1.

The two dollars per minute rate cut is subject to review by the Federal Communications Commission. It

applies to COMSAT GENERAL's regular telex service and its COMTEX service between the contiguous United States and ships or offshore facilities at sea equipped to operate with MARISAT satellites. COMTEX is a special ship-to-shore telex/mail service.

At the same time, COMSAT GENERAL would effectively reduce the cost of its MARISAT telex and telephone services to and from Hawaii by including Hawaii in its rate structure for the 48 contiguous states, also effective August 1.

## Alpert elected Assistant Vice President

Michael S. Alpert has been elected Assistant Vice President, Corporate Development, by the COMSAT Board of Directors. Mr. Alpert will head a new Corporate Development Division under Richard S. Bodman, Senior Vice President, Finance and Corporate Development.



The Corporate Development Division will be the focal point for the development of corporate plans for expansion of COMSAT's business activities, including acquisitions.

Mr. Alpert has been associated with COMSAT since 1974 as a senior advisor for corporate planning and business development. Before joining

COMSAT he served as Director of Corporate Development for Pan American World Airways from 1971 to 1974, and as Manager of Bilateral Analysis for Pan Am from 1966 to 1968. From 1968 to 1971 he was Chairman and Chief Executive Officer of Northeast Helicopters Inc., of New York.

Mr. Alpert attended Cornell University, receiving a Bachelor of Arts degree in Economics in 1962, and the Harvard Graduate School of Business Administration, receiving a Master of Business Administration degree in Finance in 1964. He became a Certified Public Accountant in 1976.

A native of New York City, Mr. Alpert is married to the former Sandra Friedman, also of New York City.

## Reber elected Vice President



Carl J. Reber has been elected Vice President for Financial Matters by the Board of Directors of COMSAT.

Mr. Reber has been with COMSAT since 1964 and was named Assistant Vice President, Financial Administration, in 1975. Mr. Reber retired from the U.S. Air Force in 1964 with the rank of colonel. During his military career he held senior financial positions in Air Force research, development and procurement areas.

Mr. Reber received a Bachelor of Science degree in Economics from Temple University and a Master of Business Administration degree in Industrial Management from The Wharton School of the University of Pennsylvania.

## TTC&M contract signed

*Mr. Kamaga Njike Paul, President-Director General of INTEL CAM (Cameroon), seated, and Mr. Lewis C. Meyer, Assistant Vice President, Procurement, COMSAT, sign contract for INTEL CAM to provide Tracking, Telemetry, Command and Monitoring Facilities and Services to INTELSAT.*



## First quarter earnings reported; 50¢-per-share quarterly dividend declared

COMSAT has reported consolidated Net Income of \$7,753,000 for the first quarter of 1978, or 97 cents per share on 8,000,014 shares outstanding.

The Board of Directors, at its monthly meeting, declared a regular quarterly dividend of 50 cents per share, payable on June 12, 1978, to all shareholders of record as of the close of business on May 12, 1978. It is COMSAT's second quarterly dividend at the 50-cent rate.

COMSAT had reported consolidated Net Income of \$6,800,000 for the fourth quarter of 1977 and \$9,697,000 for the first quarter of 1977 which, on the basis of the weighted average of the number of shares outstanding during 1977 (9,928,781), amounted to 68 cents per share and 98 cents per share, respectively.

The difference of \$1,944,000 in Net Income between the first quarter of 1978 and the first quarter a year ago is attributable primarily to a favorable adjustment to Net Income in the first quarter of 1977 of \$1,486,000, representing the cumulative effect on prior years of changes in accounting policies.

COMSAT noted that the financial statements reflect the terms of a proposed settlement of the long-standing rate proceeding before the Federal Communications Commission (FCC)

relating to COMSAT's rates for INTELSAT system services.

*(Editor's note. See settlement announcement of Chairman in his Report to the Shareholders on page 2.)*

Operating Revenues for the first quarter of 1978 totaled \$42,229,000, an increase of \$276,000 from the first quarter a year ago resulting principally from growth in MARISAT system revenue. Growth in COMSAT's traffic through the INTELSAT system substantially reduced the impact of a significant reduction in COMSAT's rates for INTELSAT services resulting from the FCC rate proceeding. The number of INTELSAT full-time half-circuits leased by COMSAT to its customers for the first quarter of 1978 was 19.5 percent greater than for the first quarter a year ago.

Operating Expenses, including income taxes, were \$35,512,000, a decrease of \$294,000 from the first quarter a year ago. The decrease relates primarily to a reduction in depreciation expense for MARISAT satellites resulting from the extension to five years from three years of the U.S. Navy's agreement to acquire MARISAT service.

Net Operating Income totaled \$6,717,000, an increase of \$570,000 from the first quarter a year ago.

Other Income was \$1,036,000, a decrease of \$1,028,000 from the first quarter of 1977. The decrease relates

primarily to the effect of a change in accounting policy with respect to allowance for funds used during construction (AFUDC) provided for in the proposed settlement of the rate proceeding. AFUDC for the first quarter of 1978 decreased by \$729,000 from the first quarter of 1977. Reflected in Other Income is the Corporation's share of losses of—and amortization of certain costs relating to—Satellite Business Systems (SBS), which reduced Net Income for the 1978 first quarter by \$851,000, an increase from the \$490,000 reduction in Net Income for the first quarter a year ago. SBS, which is in a preoperational phase, is the partnership formed by Aetna Life & Casualty, COMSAT GENERAL and IBM.

COMSAT GENERAL Corporation, COMSAT's wholly owned subsidiary, accounted for \$16,100,000 of COMSAT's 1978 first quarter Operating Revenues and \$2,675,000 of Net Income, up from \$15,192,000 and \$1,502,000, respectively, for the first quarter a year ago.

As compared with the fourth quarter of 1977, consolidated Net Income for the first quarter of 1978 increased by \$953,000, Operating Revenues increased by \$949,000, Operating Expenses decreased by \$433,000, Net Operating Income increased by \$1,382,000 and Other Income decreased by \$429,000.



## NOTES FROM PERSONNEL

### Changes in Thrift and Savings Plan offer improved benefits to employees

Important changes have been made to the Corporation's Thrift and Savings Plan. These include substantially improved vesting of the Corporation's contributions, an opportunity to make extra contributions, and earlier eligibility to participate in the Plan. According to Assistant Vice President David S. Nye, "We believe that these changes make this Plan even more beneficial to our employees."

In summary, the Plan provides that a participant may elect to make contributions (savings) to the Plan of one, two, three, four, five, or six percent of his or her base salary, and the Corporation will match employee contributions with \$.50 for each \$1.00 contributed.

The major changes to the plan are:

- After completing one year of service with the Corporation (regardless of the length of Plan participation) the Corporation's contributions are no longer subject to forfeit; that is, the employee becomes 100 percent vested in the Corporation's past contributions and in each future biweekly contribution as it is made. Formerly, the Corporation's contributions for each year vested over a three-year period. This change was made retroactive to May 10, 1977, and is reflected on the Employee Benefit Statement for 1977.

- If a full-time employee is not participating in the Plan, the employee may begin participating on the first day of any pay period beginning on or after May 1, 1978.

Previously, employees could join only at the beginning of a calendar quarter after completing six months of service.

- Effective May 1, 1978, an employee may make Supplementary Contributions to the Plan of one, two, three, or four percent of salary.



*Donald J. Chontos, Manager, Personnel Services, briefs employees on recent changes to the Thrift and Savings Plan.*

These Supplementary Contributions will not be matched by Corporation contributions, but will have all of the other advantages of investment in the Plan, including regular saving through payroll deductions, professional money management, deferral of taxes on accumulated income, and an opportunity to invest in Fund A,

which has a guarantee of interest and principal, and/or Fund B, which is a common stock fund.

An employee may choose a different investment option for the Supplementary Contributions from that chosen for regular savings (contributions of up to six percent of salary). For example, if an employee's savings are invested one hundred percent in Fund A, the employee could choose one of the other investment options, such as fifty percent in Fund A and fifty percent in Fund B, for the Supplementary Contributions. One may elect to make supplementary contributions beginning on May 1, 1978, or any subsequent pay period, by completing Form 843, or 844 if a new participant, and returning it to the Personnel Office at L'Enfant Plaza.

- Effective May 1, 1978, new provisions regarding withdrawals and partial distributions give greater flexibility in withdrawing funds. The amended Partial Distribution Provision allows the employee to elect each November to withdraw an amount equal to the value of all Savings and Thrift contributions for the second preceding Plan Year. The old provision permitted withdrawal of such contributions for the third preceding Plan Year. To make the transition to the new provision, the employee will be allowed, in November 1978, to elect distribution of the amounts for either the second preceding Plan Year (1976) or the third preceding Plan Year (1975) or both.

"Many employees have participated in the Plan since it was introduced in 1970 and have found it to be an important and integral part of their financial planning," said Mr. Nye. "We believe that these changes will make the Plan even more useful and beneficial. A description of the Plan in greater detail will be distributed in approximately three months. This description will become a part of your Employee Handbook."



## COMSAT authors make substantial contributions to science journal

COMSAT authors have made substantial contributions to the two most recent issues of ACTA ASTRONAUTICA, the Journal of the International Academy of Astronautics, according to COMSAT Labs Senior Scientist P. L. Bargellini.

The March/April and May/June 1978 issues of the Journal contain 16 papers, six of which were presented by COMSAT authors. Papers were selected and edited by Dr. D. J. Curtin, Assistant Manager of the Electric Power Department, Spacecraft Laboratory, COMSAT Labs. Associate Editors were D. E. Koelle of Messerschmitt, Bölkow, Blohm GMBH, West Germany, and F. Treble, formerly of the Royal Aircraft Establishment, United Kingdom.

Titles and authors of papers included in the two volumes, which are dedicated to communication satellites, are (asterisk indicates COMSAT author):

**March/April**—*Trade in Communications Satellites* by D. J. Curtin\*, D. E. Koelle and F. Treble; *Principles and Evolution of Satellite Communications* by P. L. Bargellini\*; *In-Orbit Operating Experience with the INTELSAT satellites* by J. R. Owens and W. L. Morgan\*; *INTELSAT-V Spacecraft Design* by R. J. Rusch and D. G. Dwyer; *Hughes Domestic Communications Satellite Systems* by E. Sion; *The RCA SATCOM* by J. E. Keigler; *The MARISAT System* by C. Dorian\*; *Economics of Communications Satellite Systems* by L. B. Early\*, C. Reber\* and P. Caughran\*; *Future Trends in Communications Satellite Systems* by R. C. Davis\*, F. H. Esch\*, L. Palmer\* and L. Pollack\*; *Applications Technology*

*Satellite Program* by P. J. McCeney; and *The SYMPHONIE Satellite System* by B. R. K. Pfeiffer and W. G. Schroter.



*Dr. D. J. Curtin of the Labs displays the two most recent issues of Acta Astronautica containing papers he was responsible for selecting and editing. The magazine is the Journal of the International Academy of Astronautics. Six of the 16 papers were presented by COMSAT authors.*

**May/June issue**—*The Communications Technology Satellite Flight Performance* by H. R. Raine; *CTS United States Experiment* by W. H. Robbins and P. L. Donoughe; *The SIRIO Programme* by F. Carassa, L. A. Ciavoli Cortelli, M. Macchia and S. Tirro; *The Orbital Test Satellite of ESA and its Associated Test Programme* by A. J. Bayliss and A. Dickinson; *Japanese Broadcast Satellite* by L. T. Seaman, H. R. Reichert, G. Kuraishi and T. Ohtake; and *Satellite Characteristics Summary* by W. L. Morgan\*.

## Annual Spring Golf Tournament held at Bretton Woods

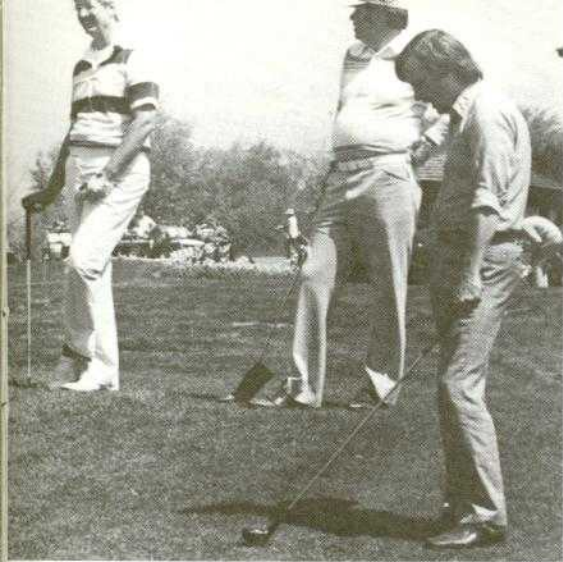
BY JOE DONNELLY

Some 70 golfers turned out for the 1978 spring golf tournament at the Bretton Woods Country Club. A first in the history of the COMSAT tournament was recorded when Steve Kirch of the Labs made a hole-in-one, accomplished with a record-setting shot on the 137-yard second hole.

Prize winners for the event were Art Cornfield, men's low gross, and Dick Wyatt, men's low net; Paulette Luper, women's low gross, and Ruth Hodgson, women's low net; Don Greer, men's second low gross, and George Meadows, men's second low net; Beezy Keebaugh, women's second low gross, and Dolores Anderson, women's second low net; Dick Bodman, men's third low gross, and Nate Tonelson, men's third low net. Dick Bodman had the men's longest drive, while Beezy Keebaugh had the big hit for the women. For the second tournament in a row Roman Rollins was closest to the pin.

In the guest category, Marv Boswer of SBS took low gross and Tom Guenther, son of the Labs' Gene Guenther, shot the low net.

The Applied Science Laboratory seemed to sweep it all this year. The hole-in-one shooter, Steve Kirch, and the men's and women's low gross, Art Cornfield and Paulette Luper, all work in Ed Rittner's Lab.



*Left to right—Jim Dunlop  
Paul Fleming and Dick Porter*



*Front to rear—Dr. Charyk,  
Don Greer and Bill Wood*



*Left to right—Ruth Adams,  
Al Kasper and Beezy Keebaugh*



*Joe Donnelly*



*Lew Meyer*



*Beezy Keebaugh*



*Bob Bourne*



*Dick Bodman*



*Paul Fleming*



*Joe Jankowski*



*Toni Loomis*



*Nate Tonelson*



*John Heck*

## CEA offers variety of activities in '78



*Anne Speare President,  
Membership Co-chairman  
Information Bulletins (Labs)*



*Ernst Steinbrecher  
Vice President*



*George Huson  
Secretary  
Clubs Co-chairman*



*Dave Bushlack  
Treasurer  
Athletics Co-chairman*



*Charles Barrett  
Athletics Chairman  
Social Co-chairman*



*Chuck Pickett  
Clubs Chairman*



*Ann Younger  
Social Co-chairman  
Information Bulletins (Plaza)*



*Sandy Fox  
Membership Chairman  
Information Bulletins (Plaza)*



*Diane Lusby  
Travel Chairman*

BY ANN YOUNGER

The purpose of the COMSAT Employees Association, CEA, is to provide a means by which COMSAT employees can participate in social, educational and athletic activities as a group, resulting in more friendly relationship among, and better acquaintanceship with, fellow employees.

The CEA is run directly by the employees through a Board of Directors

whose members plan CEA activities in addition to their full-time COMSAT employment. The CEA is a non-profit corporation with a nine-member Board, each member of which is elected for a two-year term. Four of the Board members serve as officers of the organization while the remaining five chair specific activities.

The 1978 Board members are: Anne Speare, President, Membership Co-Chairman and Information Bulletins; Ernst Steinbrecher, Vice Presi-

dent; George Huson, Secretary and Clubs Co-Chairman; Dave Bushlack, Treasurer and Athletics Co-Chairman; Charles Barrett, Athletics Chairman and Social Co-Chairman; Chuck Pickett, Clubs Chairman; Ann Younger, Information Bulletins and Social Co-Chairman; Sandy Fox, Membership Chairman and Information Bulletins; and Diane Lusby, Travel Chairman.

Several clubs within the CEA are designed to meet the needs and interests of the membership. Active clubs and their Presidents include: Art Appreciation, Brenda Smith; Auto Club, Don Kutch; Boat Club, Tom Calvit; Chess Club, Blaine Shatzer; Garden Club, Robert Redick; Homeowners Club, Gene Barrett; Motorcycle Club, Bill Baker; Music Appreciation, Beth Corry; Radio Club, Cal Cotner; and Ski club, Ron Letteney.

Among the scheduled events for 1978 are the Picnic at Smokey Glen Farm on June 11, the Christmas Dinner Dance to be held at the Holiday Inn in Bethesda on December 9, and the Children's Christmas Party at the Labs on December 16. Bulletins announcing additional planned activities of the various clubs will be distributed throughout the year.

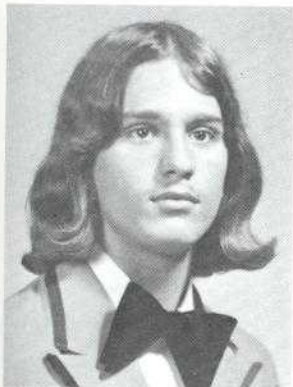
The CEA also sponsors a variety of athletic events—softball, basketball, tennis, golf tournaments and volleyball. Discounts are also available through the CEA for Busch Gardens, Kings Dominion, Magic Kingdom, for Tourmobile tickets, travel charters and the ABCD Buyer's Guide.

All aspects of CEA's functions are open to COMSAT employees. If you want to become a member, contact Sandy Fox (Plaza) or Anne Speare (Labs). Any Board member will be happy to assist you with any questions you may have concerning the CEA.

Employee recommendations regarding the creation of additional activities to be sponsored by the CEA are welcomed. Any Board member will be glad to answer questions and assist in any way.

# Class of '78 Graduates

*PATHWAYS is pleased to present the 1978 graduates, the sons and daughters of the employees of COMSAT, COMSAT General and INTELSAT.*



Mark Allen Ambrose, son of Mr. and Mrs. Ralph T. Ambrose (Labs) Brunswick H.S., Brunswick, Md.



Tina L. Arthur, daughter of Mr. and Mrs. Raymond (Bonnie) Arthur (Headquarters) B.B.A., James Madison U., Harrisonburg, Va.



Warren E. Barrett, son of Mr. and Mrs. Charles E. Barrett (Labs) Mt. Hebron H.S., Ellicott City, Md.



Alan A. Bergamini, son of Mr. and Mrs. Anthony A. Bergamini (COMSAT General) B.S., Georgetown U.



Sonia Browning, daughter of Mr. and Mrs. Darold Browning (Brewster) Brewster H.S., Brewster, Wash.



Mary Theresa Cooke, daughter of Mr. and Mrs. Paul Cooke (Headquarters) Bishop Denis J. O'Connell H.S., Arlington, Va.



Steven C. Cooper, son of Mr. and Mrs. Dennis G. Cooper (Headquarters) Bowie Senior H.S., Bowie, Md.



Germaine C. Corpuz, daughter of Mr. and Mrs. Castor R. Corpuz (Paumalu) Waipahu H.S., Waipahu, Hawaii.



Ruth Elaine Dean, daughter of Mr. and Mrs. Richard W. Dean (Etam) Rowlesburg H.S., Rowlesburg, W. Va.



Donna Rose Formella, daughter of Mr. and Mrs. John R. Formella (Etam) West Preston H.S., Masontown, W. Va.



Sheila M. Hardy, daughter of Sylvia M. Walker (Headquarters) Gar-Field H.S., Woodbridge, Va.



Pamela Haseltine, daughter of Mr. Arthur Haseltine (Andover) Mexico H.S., Mexico, Maine.



William N. Hays, Jr., son of Mr. and Mrs. Wm. N. Hays (COMSAT General) A.A. Degree, Charles County Community College.



Robert F. Hillyer, son of  
Judie Hillyer (Headquarters)  
Lackey H.S., Indian Head, Md.



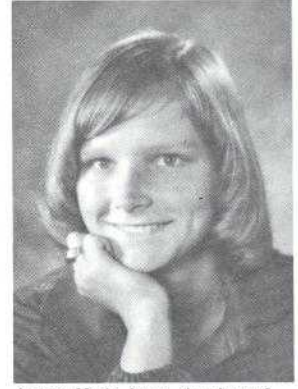
Carol Deborah Hyde, daughter of  
Dr. and Mrs. Geoffrey Hyde  
(Labs) Magruder H.S., Montgomery  
County, Md.



Thomas Michael Hyde, son of  
Dr. and Mrs. Geoffrey Hyde (Labs)  
B.A., U. of Pa., Philadelphia, Pa.



Janet Marie Inman, daughter of  
Jack and Imo Inman (Jamesburg)  
Salinas Union H.S., Salinas, Cal.



Jeanne Marie Jones, daughter of  
Mr. and Mrs. Earl J. Jones  
(Jamesburg) North Salinas H.S.,  
Salinas, Cal.



Ivor T. Knight, son of Mr. and  
Mrs. I. N. Knight (COMSAT  
General) B.Sc., Animal Sciences,  
W. Va., U., Morgantown, W. Va.



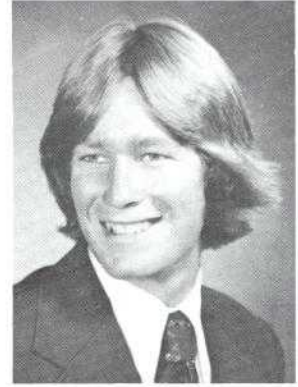
William G. Knight, son of Mr. and  
Mrs. I. N. Knight (COMSAT General)  
Bowie Senior H.S., Bowie, Md.



Sally Ann Keck, daughter of  
Mr. and Mrs. William J. Keck  
(Headquarters) B.A. Journalism,  
San Diego State College and  
Univ., San Diego, Cal.



Deborah Ann Martin, daughter of  
Mr. and Mrs. Edward J. Martin  
(COMSAT General) Charles G.  
Woodward H.S., Bethesda, Md.



Michael P. McKee, son of Mr. and  
Mrs. Walter S. McKee (Comsat General)  
Wootton H.S., Rockville, Md.



Philip Louis McRorie, son of  
Mr. and Mrs. James P. McRorie  
(Labs) Frederick H.S., Frederick, Md.



Lois Elizabeth Miller, daughter  
of Mr. and Mrs. Norman P. Miller  
(Labs) Rockville H.S., Rockville, Md.



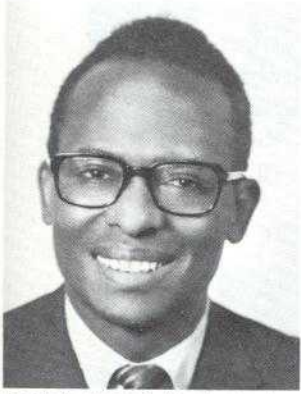
Nancy Ann Miller, daughter of  
Mr. and Mrs. Edward H. (Joan)  
Miller (Headquarters) Montgomery  
Blair H.S., Silver Spring, Md.



Carol A. Moore, daughter of  
Wayne W. Moore (Labs) Virginia  
Baptist Hospital School of  
Nursing, Lynchburg, Va.



Patricia A. Moore, daughter of  
Wayne W. Moore (Labs) George  
C. Marshall High School, Falls  
Church, Va.



Francis K. Mwangi\* (Headquarters)  
Ph.D., Bus. Adm., California  
Western U., Santa Ana, Cal.



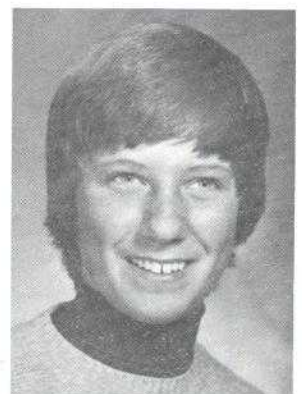
Sandra C. Orantes, daughter of  
Mr. and Mrs. César (Andrée)  
Orantes (INTELSAT) B.S. Psychology  
and B.A. Spanish, Virginia Poly-  
technic Institute and State  
U., Blacksburg, Va.



Rick Ormsby, son of Mr. and Mrs.  
Frederick N. Ormsby (Headquarters)  
James Madison H.S., Vienna, Va.



Donna K. Ours, daughter of Mr.  
and Mrs. David S. Ours (Head-  
quarters) B. Bus. Adm., College of  
William and Mary, Williamsburg, Va.



Kathy Richardson, daughter of  
Mrs. Freeman (Barbara) Hayden,  
(Andover) Associate Degree in  
Animal Technology, U. of Maine,  
Orono, Me.



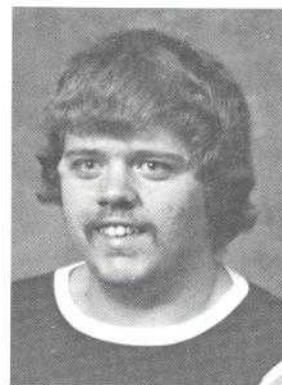
Dawn Lenora Robinson, daughter  
of Mrs. William C. Mayes (Etam)  
Braxton County H.S., Sutton, W. Va.



Kimberly Ann Roman, daughter of  
Mr. and Mrs. Edward J. Roman  
(Headquarters) Gar-Field H.S.,  
Woodbridge, Va.



David Rutter, son of Mr. and  
Mrs. Jack L. Rutter (COMSAT  
General) Peary H.S., Rockville, Md.



Samuel Timothy St. Clair, son  
of Mr. and Mrs. Samuel T.  
St. Clair (Etam) West Preston H.S.,  
Masontown, W. Va.



Lisa Christine Sepper, daughter  
of Mr. and Mrs. Frank (Vi) Sepper  
(Headquarters) Ft. Hunt H.S.,  
Alexandria, Va.



Beth A. Silvius, daughter of  
Mr. and Mrs. James R. Silvius  
(Labs) B.A., Sociology, Western  
Maryland College.



Vicky N. Singh, daughter of Mr.  
and Mrs. Narinder (Ranjit) Singh  
(Headquarters) Point Branch Senior  
H.S., Silver Spring, Md.



Beth Ann Sparrow, daughter of  
Mr. and Mrs. Lawrence R. Sparrow  
(Labs) B.A., History, U. of Maryland.



Ann Marie Summerton, daughter of  
Mr. and Mrs. Ralph Summerton  
(Andover) Telstar Regional H.S.,  
Bethel, Maine.



Gail Yamashita, daughter of Mr.  
and Mrs. Kenneth K. Yamashita  
(Paumalu) St. Andrews Priory  
School, Honolulu, Hawaii.

## Network Bits

### Field Correspondents

#### Andover

Joanne Witas

#### Brewster

Dorothy Buckingham

#### Cayey

John Gonzalez

#### Etam

Bev Conner

#### Jamesburg

C.B. Marshall

#### Labs

Norma Broughman

Joan Prince

Blaine Shatzer

#### M & S Center

Darleen Jones

#### New York

Stephen Keller

#### Paumalu

Bob Kumasaka

#### Plaza

Gloria Lipfert

#### Santa Paula

Pat Hogan

#### Southbury

Eileen Jacobsen

**ANDOVER.** The first sign of spring here at Andover is not so much the seasonal change as it is the disappearance of the snowmobiles and the increase in the number of motorcycles. And, as usual, fishing tales are cropping up again.

Safety Awards were presented to Senior Technician **Stan Morse** for the month of March and **Judy Kennedy** for April.



Stan Morse, left, receives the March Safety Award from Acting Station Administrator Shaun Arness.



Judy Kennedy, left, receives the April Safety Award from Acting Station Administrator Don Verrill.

A spring coming out party was held by the CEAA at the Country Way Restaurant in Norway complete with a smorgasbord and music provided by "Country Gold."

It seems that vacation time is here again with the **Shaun Arness** and **Charlie Jaros** families visiting Florida while the **Larry Wood** and **Art Haseltine** families spent some time in the Washington, D.C. area.

—Joanne Witas

**CAYEY.** Don Emilio celebrated his sixty-fifth birthday recently with station personnel celebrating the event with the typical ice cream and cake (with one candle) party. A



Cayey personnel help Don Emilio celebrate his sixty-fifth birthday.



Fire Chief Mercado, at left, supervises firefighting demonstration.

firefighting demonstration was conducted for station personnel by Sgt. **Salvador Mercado**, Chief of the local fire department. Facilities Mechanic **Arsenio Reyes** was presented with his 10-year Service Award.



Facilities Mechanic Reyes, right, receives his 10-year Service Award from Station Manager L. R. Rodriguez.

Our Safety Chairman and Operations Supervisor **Otto Irizarry** recently demonstrated the CPR technique for station personnel using "Resusi-Anne" as the patient. On



"Resusi-Anne" behaved like a real doll during the demonstration of the CPR technique.

March 14 we were visited by members of the ESOC Committee headed by Vice President **Richard Colino**. The Committee was having its regular meeting here in Puerto Rico. Other members of the group included **Lawrence M. Devore**, **William B. Carroll** and **Jack S. Hannon** from COMSAT; **Thomas J. O'Reilly** from HawTel; **Robert E. Conn** and **Eugene P. O'Neill** from WUI; **R. B. Nichols** of AT&T; **John B. McKinney**, **William B. Taylor** and **Howard A. White** from ITTWC; and **Leon Tuft** of RCA.

—John Gonzalez



*The ESOC group poses for an informal photo session at Cayey. Also shown is the wife of RCA's Leon Tuft.*

**ETAM.** Mike O'Hara and wife and Roger Parsons and wife (with daughter-in-law and granddaughter) recently took vacations in Florida. Don Gaston and wife also visited Florida but for another reason, to attend the wedding of their Army daughter Donna at Homestead Air Force Base.

David Cross spent his vacation putting the finishing touches on his new home in Parsons. Marvin Miller is building a home near Kingwood. Chris Sigley, a contract custodial employee, is also building a new home near Etam. Henry Bulk and your correspondent are back at work having taken medical leave, while Bill Adams is recuperating from a recent operation.

Andy Thomson retired after 10 years, sold his home in Parsons, then headed west with wife Mary—exact destination unknown. Roger Parsons has transferred to Headquarters after 10 years at Etam, he will be working in the International Operations Division.

Receiving 10-year service awards were Bill Adams, Bill Bell, Henry Bulk, Carl Cooper, Rich Dean, Spence Everly, John Formella, Don Gaston, Lenny Gifford, Bill Mayes, Vic Molek, Roger Parsons, Lynn Rector, Gerry Reeves, Sam St. Clair and Andy Thomson. Paul Mauzy received his five-year award.

Two daughters of employees were candidates for this year's Honor Student Scholarship Program, co-

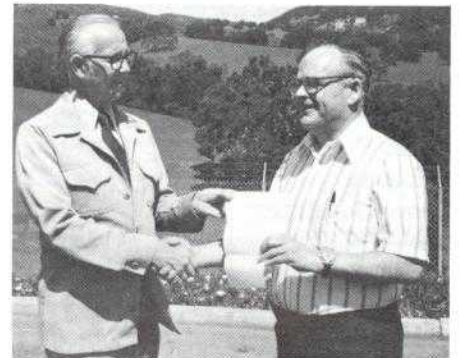
*Receiving Service Awards are, left to right: front row—Roger Parsons, Gerry Reeves, Bill Bell and Spence Everly; back row—Carl Cooper, John Formella and Bill Mayes.*



sponsored by the Mountaineer Mall in Morgantown. The Program recognizes outstanding young women of the community chosen by their school for consideration as the 1978 Honor Girl, with selection based on scholastic achievement, extracurricular activities, interviews and assigned subject essays. Donna Rose Formella, daughter of John and Jean Formella, placed second winning a \$200 award. Ruth Elaine Dean, daughter of Richard and Ruby Dean, placed third receiving a \$100 award. Donna is a senior at West Preston High School. Ruth is a senior at Rowlesburg High School.

—Bev Conner

**JAMESBURG.** Ten-Year Awards were presented to Operations Supervisor Earl Jones of Team B and Jack Ramey of Team C by Station Manager John P. Scroggs. Larry Cisneros has resigned from COMSAT to join SBS at Los Gatos, California. Larry



*Station Manager Scroggs presents Service Awards to Team B Operations Supervisor Earl Jones (above) and Team C Operations Supervisor Jack Ramey (below).*





had been an employee of COMSAT for almost 12 years. A farewell party was given Larry and his wife **Sandy** by the CEA.



*Operations Supervisor Ramey, left, conducts refresher courses with team technicians Earl Jones, Don Palmer and Junior Technician Dale Farmer (left to right).*

Station Manager Scroggs and his wife **Louise** recently took a month-long vacation to Europe. Their travels took in England, Venice, the Italian Alps, and the coastal areas of Greece and Turkey. —Cambrel Marshall

**LABS.** **Claudette Tucker** visited the Goddard Museum while on vacation in New Mexico and also viewed the Peter Hurd paintings. **Ed Mobley** was given a retirement party. **Shirley Taylor** and husband **Jim** are "Widder Douglas" and "Judge Thatcher" in a musical version of "Tom Sawyer" being presented in Martinsburg. **Debbi Boxwell** and **Jeff Widerman** were married recently. **Debbi Moore** is returning to the Executive Word Processing Center for the summer as a temporary having completed her first semester at Eastern Kentucky University.

**Alethia Woodfield**, a Damascus High School work/study student in the Executive Word Processing Center, was named "Maryland Jersey Queen-1978". **Betty Linthicum** demonstrated at the White House in honor of Elvis Presley. As part of Business Education Career Week, "**Cris**" **Inman**, Past President of the Gaithersburg Chapter of the Professional Women's Club and current State Treasurer, spoke at the Seneca Valley High School in Germantown on Metallography.

"Lucky Lady" **Donna Owen** won

the grand prize at a new store opening. **F. X. Coffee** went to the Telledga 500 Race in Alabama. Unfortunately it was rained out but he did get to see the Sportsman's Race. **Charlotte Gant** and **Richard Scott** were wed recently. **Betty Mowen** attended the Occupational Health Nurses' National Conference in New Orleans. She was one of the more than 1,500 nation-wide attendees.

**Theodore Barnard** has returned for a second go-around as a contract tech working for **Ken Stuart** in the Electric Power Branch, having worked there in 1974. **Allan Cramer** recently underwent surgery but is out of the hospital and expected back at work soon. We "stay-behinds" have heard all about the wonderful time had by our fellow workers **Edna Thomas**, **Ed Mobley**, **Marvin Ginsberg** and **Blaine Shatzer** on their Caribbean cruise on board the "TSS Carnival" to San Juan, St. Thomas and St. Maarten Islands.

We're a bit late in reporting it, but **Bill Megna** has been bitten by the ski bug and last year's beginner this year tackled Mont Tremblant in Canada. Departing the Labs are retiring **Ed Mobley** of the Model Shop, INTELSTAT Assignee **Pierre Neyret** and **LuRay Potts** of Purchasing. New Labs' employees include **Lewis Norman** and **Robert Shea**, General Manager and Director of Marketing, Communications Product Division; **Veronica Zak** (TSL), **Nghiép Nguyen** (R&QA), **Michael Ellis** (Assembly), **Roland Clark** (R&QA), and **Robert Pitta** (M&S).

COMSAT Labs' opening game was a slug fest with the Labs Eleven on the losing end. High winds and good air contributed to a King Pontiac Home Run Derby. The Labs collected 23 hits, including a perfect hitting performance by **George Meadows** with a home run and four RBIs in losing its opener, 23-13. COMSAT's "COREC" volleyball team in the Montgomery County league is in second place with a 17 win—7 loss record. The CEA Motorcycle Club motored to the Chesapeake Bay Bridge in April then walked the four-mile span. Club

participants included **Ray Curtis**, **Chuck Harp**, **Andy Brunk** and **Bill Baker**. The **Bill Allen** and **Arnold Berman** families also walked the bridge.

Service Awards to be presented at the end of June were: 15 Years—**Lou Early** and **Ray Worthmiller**; 10-years—**Bill Burch**, **Russell Fang**, **Hal Gerson**, **Chris Mahle**, **Norm Miller**, **Paul Redman**, **Blaine Shatzer**, **Fred Smith**, **Larry Sparrow**, **Henri Suyderhoud**, **George Welti** and **Carl Wenrich**; and five years—**Carl Frisby**, **Page Heston**, **Ruth Hobson**, **Brenda (Lake) Hollar**, **Fred Kelly**, **Rosa Liu**, **Bill Megna**, **Dave Merritt**, **Terry Morgan**, **Louis Ortega**, **Joan Prince** and **Peter Weiss**. —B. P. S.

**PAUMALU.** Members of Operations Team One have taken over the reins of our CEA. The newly-elected officers are: **Tim Kolb**, President; **Don Stribling**, Vice President; **Tom Kaneshiro**, Secretary; and **Cen Usita**, Treasurer. The first order of business for the new team is planning for the annual PCEA Family Picnic.

**Paul Koike**, **William Osborn** and **Kent Hunter** were presented with 10-year Service Awards by Station Manager **Glenn Vinqvist**. Work assignment changes affecting three of our Senior Technicians have resulted in the reassignment of **Tom Ota** from the Electronic Maintenance Shop to Operations Team Two, **Ronald Miyasato** from TT&C to the Maintenance Shop and **Gilbert Estores** from Operations Team Two to TT&C.

Early vacationers this year include **Tom Akimoto** and his family touring the West Coast, **Bob Makizuru** and family spending time in Disneyland and Reno and **Bob Manske** and wife **Irene** planning to visit their two sons in Texas and Connecticut.

—**Bob Kumasaka**

**PLAZA.** Congressional Relations' "**Gus**" **Rauschenbach** won the Spring golf outing of the "Mulligans" at its recent weekend tournament held

**PATHWAYS**



at Ingleside in Staunton, Virginia. The "Mulligans" had six foursomes made up of civic and government leaders. Our Gus finished the 36 holes with a net total of 127.

**Hugh and Elizabeth Keel** celebrated the arrival of their fifth child, who, incidentally, happens also to be their fifth son, and who weighed in under the name of **Robert James** at 10 pounds, 10 ounces.

—Gloria Lipfert

**SOUTHBURY.** Mrs. **Mary "May" Scott** has joined our staff as a **MARISAT** Operator. With the addition of three more voice circuits, for a total of six, two operators are now required on the day shift, Monday through Friday. **Scott Ackland**, Communications Technician, has received a two-year assignment to Fucino as a Shift Supervisor.

Each of the six **MARISAT** Operators received beautiful name pins from **Ken Welch**, Radio Officer of the **SEDCO 472**. Mr. Welch and his wife vacationed in nine states and Mexico before returning to ship duty. **Bob Ritch**, Radio Officer of the **LASH Atlantico**, recently visited our station.

Captains **G. F. Hollingsworth** and **J. N. MacDonald** of the U.S. Coast Guard, and Mr. **C. Wake-Walker**, Chief of Maritime Radio Services Division, GPO, United Kingdom, accompanied **COMSAT GENERAL's Ed Dooley** of the New York Office on a recent tour of our station. The visitors were attending an Automated Mutual-Assistance Vessel Rescue System Meeting in New York spon-

sored by the Coast Guard and had requested to visit the station and witness the **MARISAT** operation first hand.

Local artist **David Merrill** visited the station to take photos to assist him in his portrayal of the station in mural form in the new Southbury Town Hall. The earth station was selected as one of the outstanding features of the Southbury area, along with other buildings of historical or architectural significance.

—Eileen Jacobsen

Regretfully we announce that we no longer have the services of **Gloria Lipfert** as **Plaza Correspondent** due to her transfer to **INTELSAT**. We appreciate her contributions to **PATHWAYS** which date back to our adopting the new look and the new name, **PATHWAYS**, in the November/December 1975 issue. We will certainly miss her reports on **Plaza people**. We are anxious to acquire a replacement so that the **Plaza Column** may continue. Anyone interested in taking on this voluntary task should contact the Editor.

## At Presstime

### COMSAT files rate reductions with FCC

COMSAT has filed with the Federal Communications Commission (FCC) substantial rate reductions for international communications satellite channels. The lower rates will become effective August 10, unless COMSAT is permitted to make them effective at an earlier date.

The lower rates will apply to satellite channels leased to COMSAT's U.S. international common carrier customers for voice data and video services through satellites of the

INTELSAT Global System.

COMSAT's new tariffs provide for a single rate of \$1,575 per month for all voice grade channels leased for service between the U.S. and foreign points. Currently, the rates for such service range from \$2,500 to \$4,900 per month. The rate for satellite channels between the U.S. Mainland and Puerto Rico will be reduced to \$970 per month from \$1,500.

Television rates, which currently range from \$414 to \$725 for the

first 10 minutes of video and accompanying audio, will be reduced to \$275 to all points. Additional per minute charges will be \$10.00, which under existing tariffs range from \$11.40 to \$20.50.

COMSAT has reduced its rates for satellite channels several times since commercial service was first introduced via the Early Bird satellite in 1965. However, the current across-the-board rate decrease represents the largest overall reduction in the history of international satellite communications.

# ENERGY

## SAVING

### BRIEFS

In many parts of the country, the cost of air-conditioning a home is greater than the cost of heating. If you air-condition your home or apartment, you probably have noticed that your electric bill jumps sharply during summer cooling months. As a rule, we tend to waste more energy cooling than heating our residences.

The Alliance to Save Energy points out that you can do a number of simple things that could eliminate your need for an air-conditioner al-

together. First and foremost, you should be certain that your home is as tightly weatherized as you would want it to be in the winter. Obviously, you are not interested in cooling the outdoors in summer anymore than you feel like paying extra on your fuel bill because your home leaks heat in winter. Check to see that your home is properly insulated, caulked and weatherstripped.

Second, think of your attic as a giant solar collector. The sun beats

down on the roof all day, raising the attic temperature considerably. Be certain your attic is ventilated so this heat can escape. Better still, add an attic fan to pull heat and moisture from the attic. In most climates, an attic fan is very effective in cooling your home at night by drawing cool air in through open windows.

You can take advantage of this cooling during the day by keeping windows and outside doors closed during the hottest hours of the day.

---

If everyone raised air-conditioning temperatures six degrees, the Nation would save the equivalent of 36 billion kilowatt-hours of electricity in one year.

The solar energy that strikes an average building in most climates is six to ten times the amount of energy needed to heat that building.

Each degree you turn up your thermostat, if you have whole-house air-conditioning, can save you about four percent of your air-conditioning bill this summer.

---

Keeping blinds or draperies closed on summer days is especially important, since such devices can reduce heat gain through windows by as much as 50 percent. They should be light in color to reflect solar radiation back through the window.

Third, use exterior shading whenever possible. You are really lucky if your home or apartment is shaded by vegetation. Shade from a large

deciduous tree can reduce solar gain in a building by as much as 80 percent. If properly designed, awnings, overhangs, side fins, or louvered sun screens can do much to cut heat gain.

Fourth, avoid use of appliances that generate heat and moisture. If you must use your oven, do so late at night or early in the morning. Try serving cold meals, instead. Turn off lights, electric irons, television

sets, and the furnace pilot light. Dry clothes outside on a line—they will smell fresher.

If you must resort to an air-conditioner, be sure the one you buy is energy efficient. They vary considerably in efficiency. And use your air-conditioner sparingly. You may not need it at all.

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ALLIANCE to SAVE ENERGY*

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