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SATELLITE Pathways

COMSAT COMMUNICATIONS SATELLITE CORPORATION
COMSAT GENERAL CORPORATION

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July-August 1977
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Cover. *An artist's drawing depicting the many activities of the CEA by Mary Pate of COMSAT's Graphics Department.*

It started with a picnic in 1963

CEA provides diverse activities to employees for more than a decade

BY CHERRYL HOLT

The history of the CEA goes back to the early days of COMSAT, a small company with less than 50 employees, mostly technical types.

During the late spring and early summer of 1963, many staffers wandering around COMSAT's offices at the beautiful Tregaron estate were busily tossing back and forth ideas for a big project that had nothing to do with establishment of the global satellite system. It had to do with a party, a very casual picnic thing with everyone bringing his own food and beverage. Sports equipment would be rented from the D.C. Department of Recreation. There would be ponies for the children to ride. It would be a lovely way to spend a Sunday afternoon. And it was.

The picnic was held in the late summer on the lawn of Tregaron, and thus an annual event was born.

The summer party was such a success that another party could not be denied. Lou Early was one of the key people in organizing these *soirées*. So, for Christmas it was out to the Aloha Hut in Bethesda, Maryland. Early said the Aloha Hut was used because "someone's secretary knew someone at the Aloha Hut and we got a good deal."

A second picnic was held at Tregaron in the summer of 1964 and Lou Early made his home available for the second Christmas party.

1965

By the third year of COMSAT's existence, the staff had grown so large that it was necessary to move to larger quarters at 1900 L Street and 2000 K Street. With the loss of Tragaron in 1965, a new site had to be found for the summer picnic and it turned out to be Smokey Glen Farm where the picnics have been held ever since. This summer "bash" was memorable, sources say, for the thunderstorm that caught everyone off guard.

1966

By 1966 it was time to get organized because COMSAT was moving so rapidly and an interim committee was formed to look into the possibilities of forming an employee association.

(Continued on next page)

Ms. Holt is in the COMSAT Office of Public Information.

CEA-sponsored Plaza Party in the Fall of 1968.

Photo by Allan Galfund

The first Board of Directors of the CEA, from left to right, front row, Barbara Maizland, Hale Montgomery, George Domurot, Jacqueline Wakeling, Paul Thompson, Lena Bugg and Louis Early; back row, William Fallon, William Kaht, Patricia Brown, Frances Barbour, Dennis Neil, Jean Kessler, Fred Cady, Carol Lewandowski and Helen Feldman (extreme right). Gene Gabbard was not present for the photograph.

(Continued from preceding page)

The committee was composed of Helen Feldman, Jean Kessler, Lee Blair, Jane Picker, Carol Lewandowski, Fran Barbour, Judy Johns, Hale Montgomery, Angelo Petrucci, Jack Friel, Lou Early, Bill Kaht, Rock Mattos and Carol Jacobs. Feldman, Lewandowski and Early were elected temporary officers. The committee surveyed employees to see how much support existed for such an organization. It would be non-profit, run by the employees, governed by an elected board of directors and would provide activities and benefits for employees.

Results of the survey showed that 89 percent of the employees were indeed in favor of such an organization. Desired activities included group charter travel, block theater tickets, bowling, golf, and horseback riding. The committee then started working on a constitution and by-laws. Following completion of these documents, a membership drive took place. The interim committee also planned and was responsible for the 1966 picnic.

In fact, the 1966 picnic was the first "CEA Picnic." As before it was held at Smokey Glen Farm, with activities including softball and volleyball, games and competitions for the youngsters and music provided by a group with a very interesting name, "The Prince and the Paupers." Fran Barbour, Rock Mattos and Bill Kaht did most of the organizing for the picnic.

Elections for a board of directors were held in late summer of 1966. The first CEA board members were Barbara Maizland, Hale Montgomery, George Domurot, Jacqueline Wakeling, Paul Thompson, Lena Bugg, Lou Early, William Fallon, William Kaht, Patricia Brown, Fran Barbour, Dennis Neill, Jean Kessler, Fred Cady, Carol Lewandowski, Helen Feldman and Gene Gabbard. Bill Kaht was elected first CEA president by the Board.

Kaht immediately set out to increase employee membership to 100 percent, and the CEA wasted absolutely no time in getting activities organized. The first CEA Golf Tournament was held on October 29 in Reston, Virginia, at the Reston North Golf Course. Discount theater tickets were made available. Some of the movies seen at a 10 percent savings were *Romeo and Juliet, The Bible* and *Dr. Zhivago.*

A Christmas party for children of members was held in the Early Bird Room of COMSAT Headquarters (then 1900 L Street, N.W.). About 100 youngsters attended. No sooner had the adults recovered from the Children's Party, when it was time for their own "bash" to take place. The James Madison Room of the Presidential Arms was the scene of the Christmas Dance.

1967

At first it appeared that the CEA was confining its activities to social events. Not so. The Board was also hard at work on "serious" business as well. It started work in early 1967 on the formation of a Credit Union. Gene Gabbard and Bill Fallon did most of the ground work involved in doing the investigating and setting up the Credit Union. Although the CEA handled the preliminaries in its establishment, the Corporation actually sponsored it.

Investment and securities lectures were also sponsored by the CEA for employees. Response to the lectures was overwhelmingly positive. The lectures were held once a week for a four-week period. For the "handypersons" and those wanting/or needing to be handy, a group was formed by Rick Gould called the "Do-It-Yourselfers."

But even while arranging serious activities, the CEA never lost track of its social obligations. The Annual

Picnic once again took place at Smokey Glen Farm; a trip was made to Expo '67; tickets were available for Redskin games and the Christmas Dinner Dance was held at the Sheraton Park Hotel.

1968-1969

We now encounter difficulty in getting specifics about events for most of 1968 and 1969. However, we were able to reconstruct part of this two year period. The Board of Directors elected Hale Montgomery as second Association President. The notorious party-ers celebrated Spring with a big Plaza party, had a summer picnic and observed the arrival of Fall in spirit with good spirits.

1970

With the turn of the decade, a new spirit came to the CEA. Clubs were springing up all over the place. It was truly being all things to all people. There was a Radio Club through which amateur operators communicated by voice or code to fellow operators throughout the world. For stargazers, the Astronomy Club provided hours and hours of watching. Lovers of the "wild blue yonder" could fly to their hearts' content, and regularly did through the Flying Club. For the more down-to-earth there was ping-pong, bridge and chess. As far as we can tell, no one from the Tennis Club has made it to Wimbledon, but it's just a matter of time. COMSAT shutterbugs snapped and sailing enthusiasts sailed away on many occasions, thanks to those two clubs. In fact, in late 1970 the Photography Club displayed the works of several members.

The CEA officers who guided the Association to success that year were Betty Stover, president; Robert Cool and Judy Stotler, vice presidents-social; Tony Buige and George Domurot, vice presidents-athletics; Perry Klein, vice president-special arrangements; Neil Helm, vice president and treasurer; Beverly Nitkowski, secretary and Pat Lamplear, assistant secretary.

1971

A little of Bourbon Street was moved to Washington as the CEA got off to a good start. A Mardi Gras Dance at the Knights of Columbus Hall in Maryland started the social season. The other social events of the year were the Spring Cocktail Party, Annual Picnic and Christmas Dinner Dance.

The Camera Club entered the Greater Washington Council of Camera Clubs' competition and won three awards. The Amateur Radio Club also received a service award that year. The American Radio Relay League presented the service award to the Radio Club for meritorious work in connection with communication provided after an earthquake in San Fernando, California.

1972

CEA officers for 1972 were Jack Dicks, president; Kitty Harbin, vice president; Shirley Oliver, secretary; Jim Tallon, treasurer; Bert Runfola and Dave Reiser, social co-chairmen; William Burch and Dave Burks, athletic co-chairmen; and Blaine Shatzer, special clubs and activities chairman. The first order of business for the year was the selection of a CEA emblem. Designs were submitted by employees. Will Cook's design was the winning entry. Kitty Harbin resigned her vice presidency due to a move to Ohio. Bert Runfola replaced her, and Joyce Przlenski was also elected to the Board. *(Continued on page 19)*

1977 CEA Board of Directors

Martin Kelinsky
President

David Perlmutter
Vice President and Membership Co-Chairperson

Diane Lusby
Secretary

Sandy Fox
Clubs Chairperson

Dave Bushlack
Treasurer and Plaza Athletics Co-Chairperson

Hank Mueller
Labs Athletics Chairperson

Dirk Vanderloo
Clubs Co-Chairperson

Dede Runfola
Membership Chairperson
Information Bulletins

Jera Bradford
Social Chairperson

Paul Fleming (with beard), faithful CEA tournament coordinator, displays satisfaction as Don Greer presents awards to David Burks and Marv Bowser (extreme right), frequent champions since 1966.

CEA golfers' recent tournament the 17th

BY STEVE SMOKE

John Donahue, Dolores Anderson, Fred Seidel and Toni Loomis carried off top honors in the CEA's spring golf tournament held May 12 at Bretton Woods Country Club.

Donahue's low gross 76 and Anderson's 114 withstood the assault of 55 "swingers" in medal play. Seidel's 73 and Loomis' 76 took low net in handicap play.

This spring's outing was the 17th tournament sponsored by the CEA since Dr. Charyk and Drew Walker took medal and handicap honors, respectively, in the fall of 1966 at the old Reston North Golf Course.

Over the years, David Burks, Marvin Bowser and Drew Walker have dominated tournament play. Dave's eight medal and four handicap titles place him well ahead of Marv, with three medal and two handicap victories, and Drew, once medalist and twice handicapper.

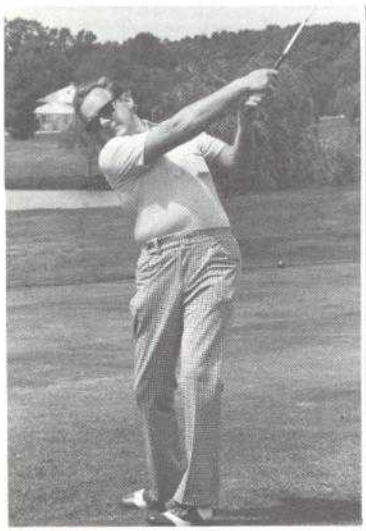
The women have also carved an enviable mark for themselves in tournament play since Mary Weisend, now with INTELSAT, took low gross honors in 1969 with a score of 101. Jean Sephton, Ruth O'Donnell, Frances Kline, Shirley Oliver and Dolores Anderson have posted the low gross scores in the succeeding years. Anderson has been medalist three times and O'Donnell, twice.

Adding to the fun of the game, prizes go to those who hit the longest drives and closest to the pin on the front and back nines, as well as to the winners and runners-up. Sometimes there are even special prizes, a "Birdie" award, for example, in the spring of 1972. John Heck received such a dubious honor when he was presented with a dead bird found on the Washingtonian course by Don Greer. (John, of course, did have a real birdie that day.)

Wandering back through memory lane, the "old-timers" come up with some interesting tournament tidbits.

- In the fall of 1973, John Welch cupped a 175-yard second shot on a par 4 hole at Montgomery Country Club for an eagle, the only one ever made in the tournament's history.
- In a 1969 playoff with Dr. Charyk and Drew Walker for handicap honors, Dave Burks shot a remarkable 73, 11 strokes lower than medalist George Sampson.
- Dave's 70 at Reston in 1968 stands as the only sub-par round ever recorded in the tournament.
- Marvin Bowser and David Burks have blasted their tee shots over 300 yards in winning longest-drive awards (downhill and with a tailwind, of course).
- No one has ever made a hole in one, but Marv Bowser's 6-incher stands as closest to the pin.
- Highest score on record is a 137, but we won't disclose the name.
- Highest number of players entered in a tournament is 85, at Reston, in 1968.
- Only one tournament has been canceled, in the spring of 1974, due to rain.

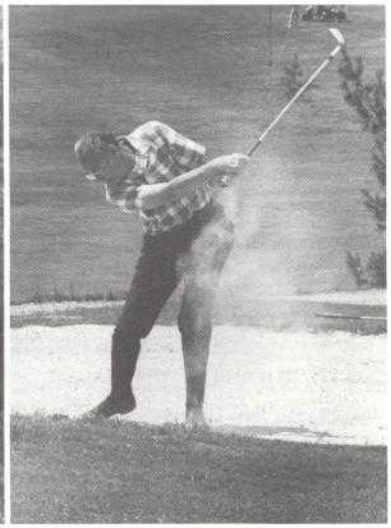
A typical hole . . . From tee to green



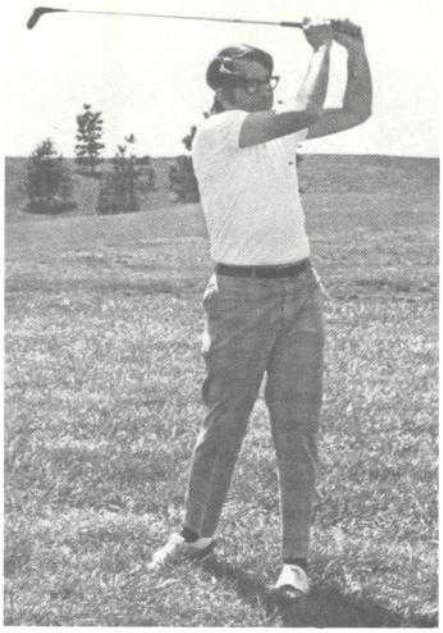
Phil McNally
"a great drive"

Toni Loomis
"a good second"

Anonymous
"Oops, out-of-bounds"



Anonymous
"trapped"



John Welch sinks a 175-yard fairway shot for an eagle in 1973.

John Donahue is the Spring 1977 medalist at Bretton Woods.

Bob Myer, Ed Wabnitz, Joe Donnelly and Roman Rollins, left to right, stoke-up (on coffee) while waiting to tee-off at Bretton Woods.

WINNERS

1966 ***Reston Golf Course***
Joseph V. Charyk (M)
Drew Walker (H)

1967 ***Reston Golf Course***
Marvin S. Bowser (M)
James Owens (H)

1968 ***Reston Golf Course***
David E. Burks (M)
John A. Gerstner (H)

1969 ***Washingtonian Golf Course***
George P. Sampson (M)
David E. Burks (H)

1970 ***Washingtonian Golf Course***
Lawrence A. Weekley (M)
H. William Wood (H)
Jean Sephton (M)

1971 ***Washingtonian Golf Course (S)***
Marvin S. Bowser (M)
David E. Burks (H)

Washingtonian Golf Course (F)
Drew Walker (M)
Marvin S. Bowser (H)
Ruth O'Donnell (M)

1972 ***Washingtonian Golf Course (S)***
David E. Burks (M)
Drew Walker (H)
Ruth O'Donnell (M)

Lake Kneedwood Golf Course (F)
David E. Burks (M)
Joseph V. Charyk (H)

1973 ***Washingtonian Golf Course (S)***
William Brauer (M)
David E. Burks (H)
Shirley Oliver (M)

(Continued on page 18)

Dolores Anderson waits
Ruth Hodgson lines up

Buddy Bell
"well, at last"

Frances Kline
"to the next one"

Al Yenyo and Jim Hall
"our scores"

INTELSAT to negotiate technical services contracts with COMSAT

The Twenty-eighth Meeting of the INTELSAT Board of Governors was held from June 22 to 29 in Monaco, at the invitation of the French Signatory. Twenty-six Governors representing seventy-eight Signatories were present for all or part of the meeting.

The Board decided, pursuant to Article 16 of the INTELSAT Operating Agreement, that there is only one source of supply—COMSAT—to meet the requirements of INTELSAT for the two technical services contracts which will be required following expiration of the Management Services Contract on February 11, 1979. It decided that the form of payments for the contracts shall be cost-reimbursement, and authorized the Director General to commence negotiations with COMSAT for the contracts. Included among its other actions the Board:

Organizational and Administrative Matters

• Elected by acclamation José Martinez Villarejo of Spain as Chairman of the Board and Marcel Perras of Canada as Vice-Chairman, for one-year terms commencing June 29.

• Appointed Charles Steffen of Switzerland Chairman of the Advisory Committee on Planning, and Neill Tuckwell of Australia as Vice-Chairman. It also appointed Otto Schmeller of Germany Chairman of the Advisory Committee on Technical Matters and Kunishi Nosaka of Japan the Vice-Chairman.

• Approved the creation of four key positions in the office of the Director General: Executive Assistant, at a grade of PR 6; Legal Advisor (grade D); Director, External Relations (grade D); and Director, Business Planning (grade D). It requested the Director General to submit the appointments for the latter three positions to the Board for its consideration at his earliest convenience, pursuant to Article X(a)(xxi) of the Agreement. It also approved creation of the position of Senior Secretary (grade GS 4) reporting to the Deputy Director General, Operations and Development. Later in the meeting the Board approved the appointment of David Leive to the post of Legal Advisor and José Alegrett to the post of Director of External Relations.

• Authorized the Director General to lease up to 66,600 square feet of space to be vacated by AMTRAK in the North Building of L'Enfant Plaza for a period of three to five years, and to negotiate for adequate corresponding parking and storage space. It noted the desirability of incorporating in the lease agreement to be negotiated, options to extend the lease period, and a right for INTELSAT to sublease any unused capacity.

Technical and Operational Matters

• Adopted as the initial three-operational-satellite configuration in the Atlantic: Major Path 1, INTELSAT IV-A at 325.5°E. Longitude; spare/Major Path 2, INTELSAT IV-A at 330.5°E. Longitude; Primary, INTELSAT IV-A at 335.5°E. Longitude, and spare for Major Path 2, INTELSAT IV at 340.5°E. Longitude. It also decided the IV-A (F-4) shall be located at 325.5°E. Longitude and the INTELSAT IV (F-3) at 340.5°E. Longitude.

• Decided to adopt for the short term the concept of off-loading traffic from the Indian Ocean Region to the Major Path 2 satellite. It requested the Director General to include in the study of long-term plans requested at the Twenty-fourth Meeting specific elements relating to: availability of earth stations to implement off-loading and/or to implement a two-operating-satellite configuration in the Indian Ocean Region, use of INTELSAT V in that region, particularly the 14/11-GHz capability; prospects for earth stations being available in that region under different space segment configurations at different points in time; a recommendation on the ultimate location of the Atlantic Major Path 2 satellite, and further study on the long term accommodation of small earth stations in the INTELSAT system.

• Requested the Director General to: include in his investigation of off-loading traffic the need for restoring a second television carrier in the Indian Region if capacity becomes available; consider a change to the Indian plan to rearrange carriers so that bandwidth might be made available for a directional television carrier; review the proposed INTELSAT IV-A Indian Ocean Region transponder arrangements to see if a second television carrier could be restored in light of the demands from the recent Global Traffic Meeting; and review the transition plans in order to provide, if possible, at least one full-time television carrier which would not be interrupted by transitional steps.

• Decided for the initial operational period of the INTELSAT V Atlantic Primary to point the 14/11-GHz west spot beam to provide maximum illumination of the U.S. Standard C earth station to be located in the Etam, West Virginia, area, in order to provide an improvement of the down-link margin and a decrease of earth station e.i.r.p. requirement.

• Decided to launch the INTELSAT IV-A (F-5) spacecraft in September 1977 as the Primary in the Indian Ocean Region and to locate it at a nominal position of 63.0°E. Longitude.

• Authorized execution of a launch services agreement with NASA for the second set of three INTELSAT IV-A satellites, with an option for the launch of three additional satellites on terms consistent with those of prior agreements, with two exceptions. These are that NASA would be authorized

Board of Governors elects Martinez-Villarejo Chairman and Perras Vice Chairman

The INTELSAT Board of Governors elected by acclamation Mr. José Martinez-Villarejo of Spain as Chairman and Mr. Marcel Perras of Canada as Vice-Chairman, for one year terms beginning June 29. Mr. Martinez-Villarejo succeeds Mr. Colino of the United States and Mr. Perras succeeds Mr. Martinez-Villarejo.

José Martinez-Villarejo

Mr. Martinez-Villarejo, the Spanish Governor, has been Vice-Chairman of the Board for the past year and has been a member of the Board and its predecessor the ICSC, since 1972. He is the Coordinator for INTELSAT Affairs for the National Telecommunications Company of Spain (CTNE), and has served for six years as head of the Space Sector of CTNE. Prior to joining CTNE in 1971, he was Chief Engineer of the International Relations Division of ENTEL Spain. Mr. Martinez-Villarejo holds the degree of Doctor Engineer of Telecommunications.

Mr. Perras has been the Canadian Governor since early 1975, when he was also named Director, INTELSAT Relations. Mr. Perras was appointed Vice-President, International Affairs for Teleglobe Canada in February, 1977. In this position he is responsible for overseeing and coordinating Teleglobe contributions to INTELSAT, the ITU, INMARSAT, the Canadian Telecommunications Carriers Association, and the Commonwealth Telecommunications Organization. He had been named Executive Assistant to the Vice-President, Engineering and Operations, in 1971 and in 1973 was appointed Manager, Data and Special Services Marketing.

Marcel Perras

(Continued from preceding page)

to procure, in consultation with INTELSAT, available insurance, at INTELSAT's cost, to protect INTELSAT, NASA and its contractors from all liability for third party claims, and INTELSAT agrees to assume all financial responsibility for any damage, destruction or loss of its satellites and other property other than that caused by the willful misconduct of NASA or its contractors.

• Authorized payment to Hughes Aircraft Company of 50 percent of any additional premium Hughes is required to pay to cover the full replacement value of a satellite prior to launch, provided that Hughes agrees to waive any rights it may have against the Government and its contractors.

• Concurred with the Director General's conclusion that the end 1979 TTC&M network be based on nine TTC&M antennas. It noted the Director General's intention to solicit expressions of interest in providing TTC&M services from Signatories with suitable earth stations, and noted that he will request supplemental information on horizon and propagation aspects from those Signatories whose earth station elevation angle is less than 10 degrees.

• Authorized the Director General to execute a reciprocal TTC&M services agreement with COMSAT GENERAL, and authorized purchase of necessary equipment for installation at Fucino, Italy, in an amount estimated at $5,000.

• Approved an agreement for lease of one transponder to Uganda on a full time basis for one year, and approved in principle the allotment of one and one-half transponders to Saudi Arabia, and one-quarter transponder to Oman, on a preemptible basis to meet their respective domestic public telecommunications requirements.

• Requested the Director General to bring to the attention of the Parties, Signatories and INTELSAT administrations in an appropriate fashion that it would be desirable that the concepts contained in the report of the Advisory Committee on Technical Matters be given careful consideration in the development of national positions for the CCIR and/or 1979 WARC meetings.

• Requested the Advisory Committee on Technical Matters to review the status of development of technologies associated with intersatellite links, satellite-switched

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

BY ROBERT E. BERNIER
AND
SHARYN KILDERRY

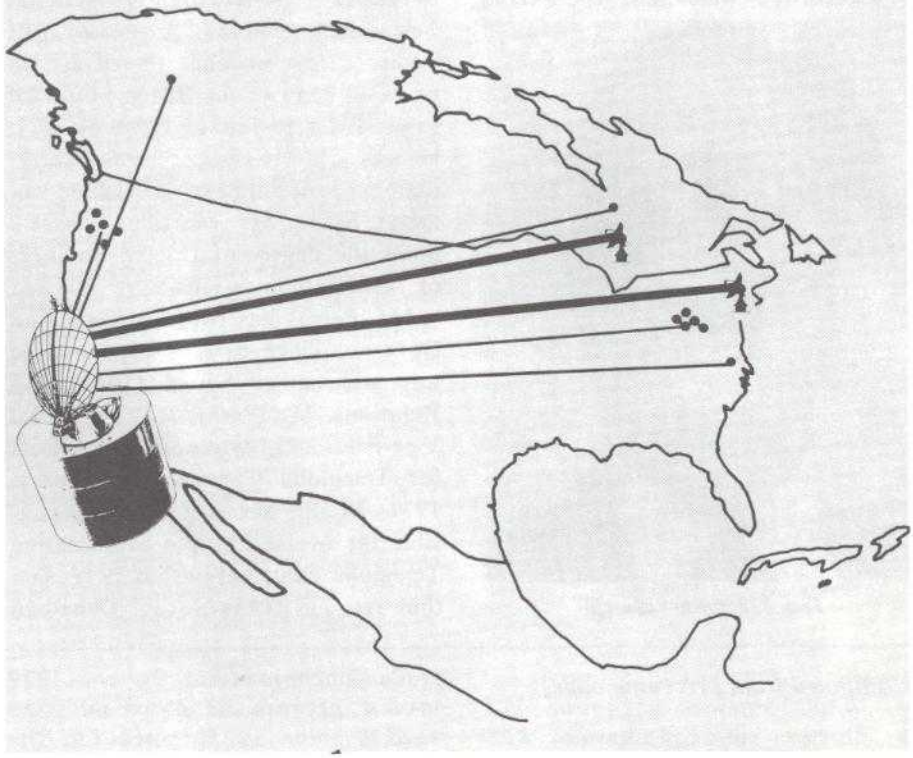
Recent events point up the fact that water is a precious commodity, made more so by its increasing scarcity. Of all the world's water, less than one-half of one percent is easily accessible and suitable for human consumption or for agricultural and industrial utilization.

Of that small serviceable percentage four-fifths is used for agriculture, leaving only one-fifth for human use. With the current global population of four billion expected to reach seven billion by the year 2000, water resources monitoring and control will become a critical adjunct to other types of environmental monitoring which seek to balance dwindling supply with increasing demand. Commercial communications satellite technology can aid significantly in this monitoring effort.

In order to demonstrate the feasibility of such a program, COMSAT General Corporation has undertaken an innovative six-month demonstration program, in partnership with Telesat Canada and the Water Resources Division of the United States Geological Survey (USGS), to explore the use of operational communications satellites to aid in monitoring water level and quality in widely-dispersed and remote areas. The operation of this program, scheduled to begin in September, will provide for more rapid and efficient response to hydrology management, flood emergencies, pollution, quality monitoring and other environmental situations.

Mr. Bernier is Director, Information Services Development, COMSAT General. Ms. Kilderry is a Planning Research Assistant.

System Illustration



Information on water level and quality, as well as other types of environmental measurements, are now obtained by costly and time-consuming site visits. Connecting all remote areas to a centralized facility via land-lines can alleviate this problem, but terrestrial interconnection is difficult and expensive to implement, or not practical in many remote locations. By using satellites to collect and transmit data, travel to the sites can be greatly reduced and the cost per link will not be dependent on proximity to the central receiving facility. Additionally, the data and interpretive services will be available in real time rather than after the fact. This capability will permit realistic application of management techniques to the preservation of this precious commodity, water.

The three major elements of the system configuration are: small, transmit-only, on-site Data Collection Platforms (DCPs); the satellite; and the central receive facility.

In the demonstration, COMSAT GENERAL will provide 15 DCPs, five each to be co-located with USGS hydrological sensors in remote areas of Pennsylvania and southern Oregon and one located near USGS Headquarters in Reston, Virginia. Two DCPs will be on loan to Telesat Canada for its related research program

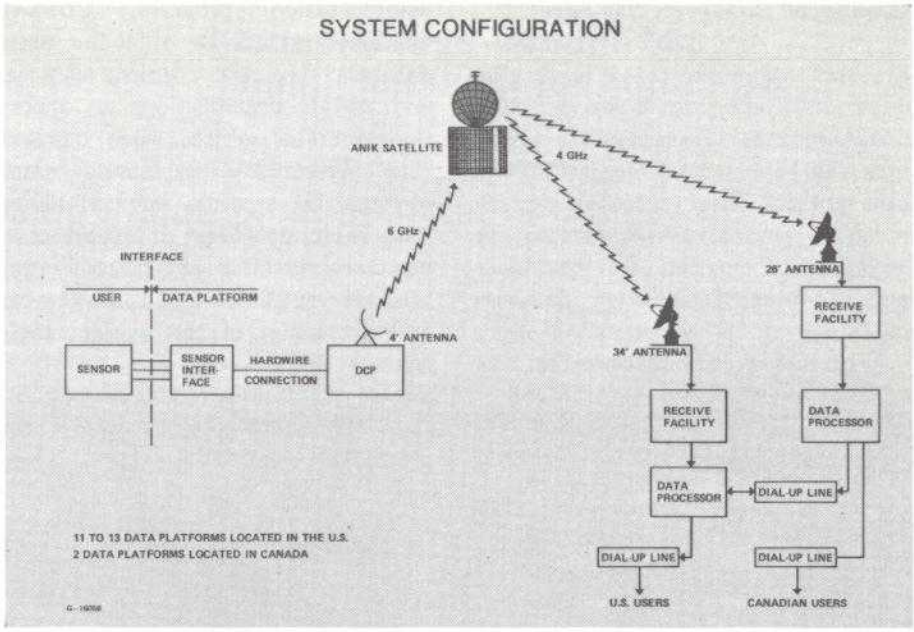
located in the Ottawa area and near Edmonton, Alberta. The final two platforms will serve as spares.

The platforms make good sense economically for remote site communications transmission since they are almost maintenance free. The only upkeep expected during the demonstration is the replacement of batteries after approximately four months' use. If the primary operating satellite experiences an outage of any duration, traffic can be switched to a back-up transponder in the same satellite or, if the entire primary satellite is out of operation, service can be switched to another satellite.

The information on water level, flow, precipitation, and various chemical and physical properties gathered by the sensors, will be transmitted via the DCP in a random access burst mode, each platform operating independently of the others. Data will be transmitted in bursts, one-fifth of a second in duration, approximately every 15 minutes, to the Canadian domestic Anik 1 satellite, located at 104° West Longitude, and thence to the receive stations. Telesat Canada, for this demonstration only, is providing the satellite capacity throughout.

There are several advantages associated with using commercial communications satellites for this sort of operation: they have an excellent reliability record, abundant capacity and continuing service availability. In addition, service can be offered over a large area utilizing common space and receive facilities, thereby creating a homogeneous service for all parts of the country. In a fully operational system, one satellite transponder would be capable of handling approximately 200,000 DCPs.

Virtually real-time information will be relayed from the satellite to a central receiving facility located at COMSAT GENERAL's Southbury, Connecticut, earth station and to the Telesat Canada earth station near Ottawa. The U.S. station will operate on data from the sensors located in the U.S. and the Canadian station on



data from that country. However, since the DCP equipment in both stations is essentially identical, both can receive information transmitted from all sites and act as back-up to one another, if need be.

At the receive facility in Southbury, information will be formatted and stored for transmission over normal telephone land-line to a USGS Water Resources Division computer in Reston or to offices in Oregon and Pennsylvania.

At any given time, information covering a rotating ten-day period can be accessed on a call-up basis. Additionally, data is archived on magnetic tape at the central receive facility to ensure against data loss due to land-line failure. Telephone call-up between the Southbury and Ottawa stations further ensures full receive terminal redundancy.

By gathering data from many dispersed points and transmitting it to a centralized locality where it can be analyzed as a unit and distributed to

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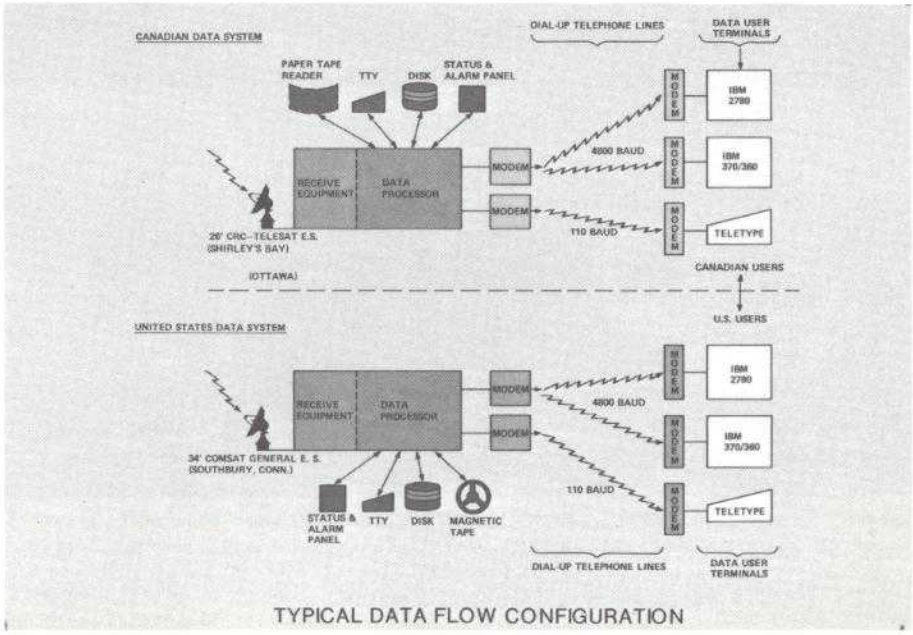


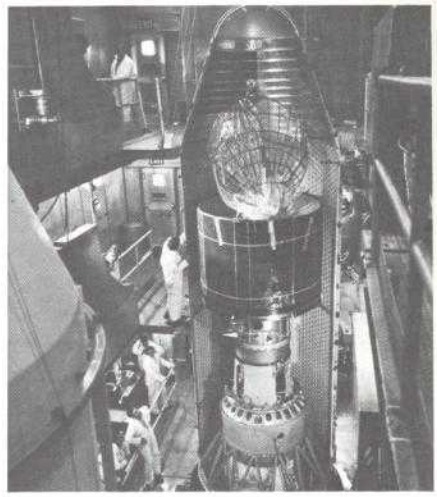
TYPICAL DATA FLOW CONFIGURATION

(Continued from preceding page)

the user community on a more efficient and less cost-intensive scale, commercial communications satellites will have moved into an important new era. This type of utilization is an important complement to the ongoing information services business COMSAT GENERAL is developing.

With the expected success of the demonstration program, COMSAT GENERAL intends to offer the USGS and other U.S. Government agencies and private organizations an operational service which, when coupled with additional environmental monitoring and sensing services under evaluation, promises to introduce a new commercial application of satellite technology for the management and protection of the world's environment and resources.

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



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 (bottom photo).

Justice Department requests documents of SBS partners and predecessor organizations

Satellite Business Systems (SBS) and the partners which own it have received Civil Investigative Demands from the Department of Justice. The Demands state they are made in the course of an investigation to determine whether there may have been, or may be, antitrust violations in connection with the establishment of SBS and the acquisition of the assets of predecessor organizations.

The Demands request documentary materials going back to the early days of SBS's predecessor organizations, CML Satellite Corporation and, before that, MCI Lockheed Satellite Corporation.

The parties on which Demands have been served are SBS and the companies that participated in its establishment; COMSAT, COMSAT GENERAL, IBM, Aetna Life & Casualty and The Aetna Casualty and Surety Company.

In the Federal Communications Commission (FCC) actions leading to the SBS grant, the Department of Justice did not oppose the establishment of the SBS domestic satellite system. However, the Department had requested the FCC to conduct evidentiary hearings to obtain further information on the effects of the SBS Partnership on competition prior to approving the SBS system.

The FCC rejected such a hearing in its SBS Order. The Commission determined that any arguably anticompetitive effects of the SBS system are not likely to occur given the present and future market structures and the FCC's continuing regulatory supervision of this field. Moreover, the FCC concluded that the rapid establishment of the SBS system would be in the public interest and that the public interest benefits outweigh any potential anticompetitive concerns.

SBS does not expect the Demands to obstruct progress toward the establishment of the SBS system.

Manufacturers asked to bid on RF terminals for SBS

Satellite Business Systems (SBS) has issued a Request for Proposals for design and construction of radio frequency (RF) terminals for its proposed communications satellite system.

The request, issued to U.S. and foreign manufacturers, asks for fixed price bids on four prototype RF terminals (two with 5-meter antennas and two with 7-meter antennas) and for planning estimate quotes on up to 500 operational RF terminals. The prototypes are to be delivered within 12 months from award of a contract, and the operational RF terminals are for phased delivery beginning in 1980.

SBS asked for receipt of proposals by July 27, 1977, to permit a contract award for the prototype units this fall. A contract award for operational units is expected in the second quarter of 1979, and would be preceded by a request for fixed price bids.

For the prototype units, SBS is considering the selection of two separate vendors to supply four units each. This would permit each vendor to deliver two units to SBS for simulated operation and evaluation, and to keep two at his facilities for life testing. The SBS objective through such a competitive procurement is to assure that the subsequent operational RF terminals are designed and built for reliable, unattended operation over 30,000 hours mean time between service interruptions.

SBS is establishing a U.S. domestic communications satellite system to serve businesses, government agencies and other large communications users. SBS will provide earth stations at each customer's traffic concentration points in order to create fully switched private networks. The network services will include data, voice, facsimile and videoconferencing to meet most of a customer's intracompany communications requirements.

Each customer will have the capability to use his customized network as he wishes and when he wishes, through the time-division multiple-access (TMDA) feature of the system.

Operating at the higher frequency ranges of 12 and 14 gigahertz to avoid interference with existing microwave facilities, the SBS system will permit siting of earth stations on customers' premises (*e.g.*, rooftops and parking lots) in urban and rural neighborhoods. The advantages of customer-premise earth stations include an avoidance of terrestrial interconnection facilities and costs.

For its space segment, SBS issued a Request for Proposals on May 16, 1977, for the construction of three satellites—two for launch in the second half of 1980 and one as a ground spare. Proposals were due by August 8, 1977, with a contract award to be made later this year.

The SBS operational system is scheduled to begin service in January 1981. In the meantime, SBS is conducting a preoperational program to evaluate equipment and techniques. As part of this program, traffic tests are now being conducted through SBS developmental earth stations at Poughkeepsie, New York, and Los Gatos, California, via transponder capacity leased in an existing satellite.

SBS requests proposals for 5 prototype modems

Satellite Business Systems (SBS) has issued Requests for Proposals for the design and manufacture of high-speed TMDA burst modems for SBS communications satellite earth stations.

The request went to U.S. and foreign manufacturers. Responses are due within 60 days in order that SBS may make a contract award later this year.

SBS asked for fixed price proposals for delivery within 12 months of five prototype modems—four equipped for operation at 43 megabits per second.

(Continued on page 14)

FCC's Common Carrier Chief briefed

Photo by Allan Galfund

Walter R. Hinchman, left, Chief of the FCC's Common Carrier Bureau, is briefed by George A. Lawler, Director of COMSAT Sales and Business Development, on the benefits of DIGISAT at the 30th Annual Conference of the International Communications Association (ICA) in Toronto, Canada. COMSAT provided a display of DIGISAT for the ICA exhibition.

AFCEA DIGISAT display

Dave Gourley, left, and Howard Briley of COMSAT's Sales and Business Development describe DIGISAT advantages to Acting Chief Veronica Ahearn of the FCC's International Satellite Branch at the 31st Annual Convention of the Armed Forces Communications and Electronics Association (AFCEA) at the Sheraton Park Hotel in Washington, D.C. COMSAT provided a DIGISAT display (photo below) at the AFCEA Convention.

Photos by Allan Galfund

Battle named Vice-Chairman of UN Day Committee

Lucius D. Battle, Senior Vice President, Communications Satellite Corporation, was recently named Vice Chairman of the 1977 National UN Day Committee by this year's National UN Day Chairman, Henry Ford II, Chairman of the Ford Motor Company. Mr. Ford, who was appointed by President Jimmy Carter, formed the committee, composed of over 1,000 prominent American business and labor leaders, to help direct this fall's United Nations Day program across the country. UN Day is officially observed on October 24, the anniversary of the United Nations.

Mr. Ford and the Committee were inaugurated at a gala dinner at the New York Hilton on Tuesday, June 7. On behalf of President Carter, Andrew Young, U.S. Ambassador to the UN, presented Mr. Ford with his official appointment as National UN Day Chairman. Governor William W. Scranton, former U.S. Ambassador to the UN and now Chairman of the United Nations Association of the United States (UNA-USA), was the official host and dinner chairman.

The featured speaker of the evening was Charles L. Schultze, Chairman of the President's Council of Economic Advisers. Prior to the dinner, the members of the National UN Day Committee and their guests attended a reception at the United Nations hosted by Secretary-General Kurt Waldheim.

Worth Noting

Richard R. Colino, COMSAT Vice President, has been appointed General Manager of the U.S. INTELSAT Division. **William B. Carroll, Irving Goldstein** and **Robert W. Kinzie** were appointed Assistant General Managers of USID.

Robert D. Briskman, formerly a COMSAT GENERAL Assistant Vice President, has joined SBS as Program Manager for SBS' Preoperational Program.

Alan R. Coburn has been named Station Manager of COMSAT GENERAL's Southbury, Connecticut, earth station.

Richard J. McBride is returning to COMSAT from COMSAT GENERAL to become Manager, Facilities Implementation, USID.

Howard W. Flieger of the Labs was elected to a two-year term on the Council of the National Capitol Section of the AIAA.

COMSAT reports second quarter earnings; 25¢ quarterly dividend declared

COMSAT has reported consolidated Net Income of $8,966,000, or 90 cents per share, for the second quarter of 1977. This was a decrease of 18 cents per share from the second quarter of 1976, but an increase of one cent per share from the first quarter of 1977.

The decrease in consolidated Net Income from that of the second quarter a year ago was caused by the deduction of $14,946,000, or 75 cents per share after taxes, from COMSAT's global system revenue under an accounting and refund order issued by the Federal Communications Commission (FCC).

Under the FCC order, which was effective as of June 16, 1976, COMSAT is placing in escrow revenue amounting to the difference between present charges to its common carrier customers for global system service and charges calculated on the basis of lower rates that would be required if the FCC's rate decision of December 1975 were to be affirmed. The escrowed revenue, which amounted to $59,535,000 as of June 30, 1977, exclusive of interest earned thereon, is subject to possible refund in whole or in part to COMSAT's customers, depending on the outcome of COMSAT's appeal from the rate decision. The appeal is pending in the U.S. Court of Appeals for the District of Columbia Circuit.

A quarterly dividend of 25 cents per share, payable on September 12, 1977, to all shareholders of record as of the close of business on August 12, 1977, was also declared by the COMSAT Board of Directors at its regular monthly meeting. It is COMSAT's 28th consecutive quarterly dividend.

Operating revenues for the second quarter, net of amounts required to be placed in escrow, amounted to $42,035,000, exceeding those of the second quarter a year ago by $2,579,000 or about seven percent. The increase resulted from continued growth in the number of half-circuits leased by COMSAT to its carrier customers for global communications, and from revenues received from MARISAT and COMSAT services provided by COMSAT GENERAL Corporation, COMSAT's wholly owned subsidiary. At June 30, 1977, the number of half-circuits leased by COMSAT in its global system operation was 4,759, an increase of 315 from March 31, 1977, and 627 from June 30, 1976.

COMSAT GENERAL accounted for $15,149,000 of COMSAT's second quarter revenues and 13 cents per share of consolidated Net Income. In the second quarter of 1976, COMSAT GENERAL operations resulted in a net loss of six cents per share.

Operating Expenses, including income taxes, were $35,012,000 for the second quarter, up from $29,698,000 for the second quarter of last year, largely because of higher depreciation charges resulting from MARISAT and COMSTAR satellites placed in service.

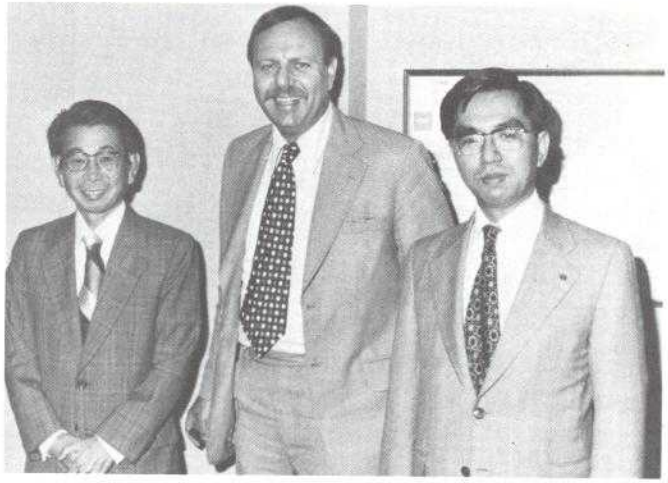
Because of the higher expenses and the escrow of revenue, Net Operating Income declined to $7,023,000 from $9,758,000 for the second quarter a year ago.

Other Income, after provision for income taxes, amounted to $1,943,000 for the second quarter, an increase of $852,000 from Other Income of $1,091,000 for the second quarter of 1976. The increase in Other Income is principally attributable to an increase in the amortization of investment tax credit.

For the first six months of 1977, consolidated Net Income amounted to $17,846,000, or $1.78 per share, down from $21,890,000, or $2.19 per share, for the first six months of 1976; Net Operating Income was $13,903,000, or $1.39 per share, down from $19,862,000, or $1.99 per share; Operating revenues net of amounts required to be placed in escrow, amounted to $83,988,000, up from $76,732,000; Operating Expenses, including income taxes, were $70,085,000, up from $56,870,000; and Other Income, after provision for income taxes, amounted to $3,943,000, up from $2,028,000 for the first six months of 1976.

As compared to the first quarter of 1977, consolidated Net Income for the second quarter of 1977 increased by $86,000 or one cent per share; Operating revenues, net of amounts required to be placed in escrow, increased by $82,000; Operating Expenses decreased by $61,000; and Other Income decreased by $57,000.

KDD's Washington office gets new chief



Richard R. Colino (center), Vice President of COMSAT's U.S. Intelsat Division, bids farewell to Haruo Watanabe, left, who is returning to KDD Headquarters in Tokyo, Japan, upon completion of an assignment as Chief of the KDD Office in Washington. Mr. Kuwishi Wosaka, right, a frequent visitor to the Washington area, succeeds Mr. Watanabe.

SBS

(Continued from page 11)

SBS contemplates the award of contracts to two manufacturers. Their modems would be subjected to competitive evaluation by SBS. Each manufacturer would keep two modems for life testing at his facilities and deliver three to SBS for field trials.

In addition, SBS asked manufacturers for planning estimate prices for up to 600 modems for the SBS operational system. A contract for these modems is to be awarded on the basis of further proposals after evaluation of the prototypes.

The modems will be advanced, innovative devices for the modulation/demodulation of burst-mode digital bitstreams and signal processing at the SBS customer-premises earth stations. In the SBS system, a customer's communications traffic—voice, data, facsimile, video—will be digitized and transmitted to earth station destinations in high-speed bursts.

A high-speed TDMA (time-division, multiple-access) burst modem is one of three major components of the forthcoming SBS earth stations. The other two are the radio frequency (RF) terminal and the Satellite Communications Controller (SCC).

SBS recently issued Requests for Proposals (RFPS) for prototype RF terminals and for three SBS satellites.

SBS is establishing a satellite communications system to serve large users in the contiguous United States. SBS plans to launch its first two satellites in the second half of 1980 and begin services through its operational system in January 1981. A preoperational program, involving SBS developmental earth stations and leased satellite capacity, was begun by SBS in April 1977.

Labs-developed battery used on Navy satellite

The first satellite using a nickel-hydrogen battery for energy storage was launched recently from Vandenberg Air Force Base, California. The Navy's Navigation Technology Satellite, NTS-2, employs the new nickel-hydrogen battery developed at COMSAT Laboratories under INTELSAT sponsorship.

COMSAT provided nickel-hydrogen storage cells to the Naval Research Laboratory, which fabricated the cells into two seven-cell storage batteries for use as the prime source of stored energy for the NTS-2 satellite.

The new nickel-hydrogen batteries are rechargeable, highly reliable, and longer-lived than nickel-cadmium batteries, which currently are used on satellites. The new batteries promise three times the energy density (energy stored per unit weight) and at least five times the cyclic lifetime of the nickel-cadmium battery.

The Naval Research Laboratory and COMSAT are pioneering this new technology with the expectation that the new battery will significantly improve the lifetime and energy density of satellite energy storage systems.

A brochure entitled "The New High Energy Nickel-Hydrogen Battery," is available in the Office of Public Information.

SBS seeks authority to construct earth station

Satellite Business Systems has applied to the Federal Communications Commission for authority to construct an earth station on IBM premises at Research Triangle Park near Raleigh and Durham, North Carolina.

It will be the third earth station in SBS's Preoperational Program. Along with existing SBS earth stations at Poughkeepsie, New York, and Los Gatos, California, the Raleigh station will be used for common carrier, private line, voice and high-speed data communications services to IBM.

The station, to be procured from Comtech Laboratories of Smithtown, New York, will consist of a dish antenna 13 meters in diameter and associated radio frequency equipment for use with the transponder capacity that SBS leases in an existing domestic satellite.

SBS plans to have the earth station completed by mid-November 1977 and to begin the common carrier services to IBM by the beginning of 1978. The Preoperational Program is a prelude to SBS's full operational system of satellites and earth stations, scheduled for completion by the end of 1980.

Peruvian information chief visits COMSAT

Peruvian communications officials, led by General Cesar Augusto Vinatea, Chief of Peru's National Information System (SINADI), visit COMSAT Headquarters as part of a U.S. State Department tour of U.S. communications facilities. General Vinatea talks to the Peruvian earth station in Lurin via the satellite orderwire while other members of the group, escorted by James T. McKenna of the Information Office (left), listen in.

COMSAT donates earth terminal to World Scout Organization

BY ALLAN GALFUND

"This is George 3 Zulu Charlie Zulu, Portable Whiskey 3 calling. Come in anybody who is listening to this frequency."

"Okay, Portable Whiskey 3, this is W4MOP and I'm at Louisville Kentucky."

"Fine, Portable W4. This is Joe Kasser and we're at the COMSAT Labs in Clarksburg, Maryland. We're having a little ceremony here at which we're donating a radio terminal to the World Scouts and we have some distinguished guests with us, including the Chairman of the World Scout Organization, Mr. Irving Feist, and Mr. Leonard J. Jarrett, Director of Administration; Mr. Lucius D. Battle, Senior Vice President of COMSAT, and Dr. Burton I. Edelson, Assistant Vice President and Director of COMSAT Laboratories. How do you copy me?"

"Portable W3, W4MOP here and you're coming in loud and clear, about 5 by 5."

"Roger, W4MOP, this is George 3 Zulu Charlie Zulu Portable W3 leaving you now to pick up other listeners."

" . . . Hello Portable Whiskey 3, this is Whiskey 9, Charlie Oscar Echo in Chicago . . . "

" . . . This is King 4 Uniform Quebec in Los Angeles . . . "

And so it went in a ceremony held at the Labs in which the World Scout Bureau, executive arm of the World Scout Organization, received a significant boost in its telecommunications capability, a COMSAT-donated earth terminal for communicating through the OSCAR series of amateur radio satellites.

During the ceremony, the operation of the amateur radio earth terminal was demonstrated with communications established through the OSCAR 7 satellite to terminals in the midwest, California and other regions. The terminal, built by the COMSAT Laboratories Amateur Radio Club, with funds donated by COMSAT, was presented to the World Scout Bureau by Mr. Battle and Dr. Edelson. It was accepted by Mr. Feist and Mr. Jarrett.

Mr. Galfund is a COMSAT Senior Information Officer.

Joe Kasser of the Labs, at transmitter, establishes communications with terminals around the country via Oscar 7 satellite utilizing the radio terminal in the background donated by COMSAT to the World Scout Organization. Discussing the activities are, left to right, Irving Feist, Chairman of the World Scout Organization, COMSAT's Burton I. Edelson and Lucius D. Battle and Leonard Jarrett, Director of Administration for the World Scout Organization (back to camera).

In opening the ceremonies Dr. Edelson said: "We are privileged and pleased here at COMSAT to have this opportunity to contribute to the World Boy Scout Movement."

In making the presentation Mr. Battle remarked: "We are extremely happy to find common ground, or perhaps common space might be more accurate, with the World Scout Organization. I think many of our goals and purposes are similar. We are a communications entity and so are you, in a way. It is a pleasure to present this terminal to you, hopefully contributing to the pursuit of a better world and better service to mankind through the technology available through it."

Mr. Feist in accepting the terminal responded: "Although scouting itself is 70 years old, its programs keep up with the times. Ever since the launching of the first OSCAR satellite we have felt that satellite communications would be a 'natural' for a world movement such as ours. From experience, we have found that it is only necessary to start a new idea, for it to spread and increase. Now, thanks to the generosity of COMSAT and the hard work of the members of the COMSAT Amateur Radio Club, we are in a position to take the next step in our amateur radio program.

"It is with real gratitude that I, as Chairman of the World Scout Organization and the representative of some 15 million boys around the world, accept this most generous donation."

The World Scout Bureau, headquartered in Geneva, Switzerland, directs and provides assistance to scouting organizations with 15 million members in 109 countries, and emphasizes progress through such programs as flying, telecommunications, and weather forecasting in addition to the traditional knot-tying and camping. Since 1958, the World Scout Bureau has held annual Jamborees-On-The-Air by means of amateur radio, with about 6,000 stations in some 70 countries participating.

Notes From Personnel

BY MOSETTA BLACKMON

Job opportunities at COMSAT? There are excellent opportunities opening up almost every day. During the past twelve months 140 employees used our internal posting procedure and found new and challenging positions within the company.

COMSAT and COMSAT GENERAL endeavor to ensure that employees have an opportunity to be considered, before outsiders, for any open position. To help achieve this goal, we post non-managerial positions internally for a period of five (5) working days to allow employees the opportunity to raise questions, questions which can be answered by your local Personnel Office or Station Administrator.

The Corporate Personnel Office is organized into three areas: Compensation and Benefits, EEO and Human Resources Development, and Staffing and Personnel Services. If interested in being considered for an open position consult area three, Staffing and Personnel Services. Employees of COMSAT Laboratories, COMSAT GENERAL Corporation, and Earth Stations should consult their local Personnel Office or Station Administrator.

Position Requirements

Generally, you need to have been a regular employee for at least one year and in your present position for at least six months before you are eligible for a promotion or transfer. These requirements can be reduced or waived under special circumstances.

If you are interested in a posted position (bulletin boards are located on each floor of the Plaza and main lobbies of Earth Stations and Labs), contact your local personnel representatives to verify the requirements of the position and to determine whether it would be a promotional or lateral transfer opportunity for you. Consideration should then be given to whether your background and experience meet the qualifications specified in the posting and whether the position will help you attain personal career goals and utilize existing expertise.

To apply for a position opening, you should pick up a CSC 114 (Application for Position Opening), fill out the top positions of the application, have your supervisor add his/her comments, and sign the form. You should then return the application to Personnel. A Personnel representative will review your file, performance appraisal, discuss the requirements and duties of the job with you, explore your qualifications for the job, and answer any questions you may have. An interview for you with the receiving supervisor will then be arranged.

There is one exception to the practice of posting all non-managerial jobs. Within a given unit, an opening might provide a natural step up a job ladder—Junior Secretary, Secretary, Senior Secretary, or Accountant, Senior Accountant—for instance. In these situations, the unit manager is free to select a qualified candidate without utilizing the posting procedure.

Internal Search Procedure

When Personnel is notified of a managerial position opening, a memo is circulated to Vice Presidents and Assistant Vice Presidents to solicit applicants to fill the vacancy. Directors and Managers review the qualifications of their staff and make nominations to their Vice Presidents or Assistant Vice Presidents. Candidates will be contacted and interviewed. The internal search approach is also used sometimes to supplement the position procedure.

Outside Applicants

COMSAT welcomes employment referrals. Employees wishing to make referrals should be sure that the job is approved for external recruitment (designated on Postings by an *), check with Personnel to ensure that there are no internal applicants, and explain the requirements of the job properly. For example, a bookkeeper without accounting training or experience should not be referred for a Senior Accountant's position. Employees may give Personnel the name and address of the referral, to whom an application will be sent. An applicant may also call 554-6060 for employment information.

Ms. Blackmon is Senior Personnel Administrator, Personnel Office.

Safety's Nancy Dougherty, Virginia Safety Association award winner

Nancy Dougherty joined COMSAT in November 1976, as Safety and Health Administrator reporting to Personnel's Lyn Russell. She is responsible for COMSAT's safety program and coordinates and supervises the in-house medical services program. She is a Registered Nurse, graduating from the Alexandria Hospital School of Nursing. Before joining COMSAT, Ms. Dougherty served as Occupational Health Nurse and Safety Coordinator at Hazelton Laboratories America, Inc. She has served on the Executive Committee of the Virginia Safety Association, and is a member of the American Association of Industrial Nurses, Metropolitan Washington Industrial Nurses Association, American Nurses Association and American Industrial Hygienists Association.

At the 1977 V.S.A. Conference held recently in Roanoke, Virginia, Ms. Dougherty received the award of "Safety Celebrity" from the Virginia Safety Association for being the key person on the safety scene for 1976-77 and for personal and professional contributions in the field of Safety.

INTELSAT

(Continued from page 7)

TDMA and multiple narrow-beam antennas, and provide an assessment to the Advisory Committee on Planning as to when these technologies might be available for operational application by INTELSAT. The Board also requested the Director General to provide the necessary information for the Advisory Committee on Technical Matters to perform a preliminary assessment of these technologies at its next meeting.

- Decided that certain technologies as recommended by the Advisory Committee on Planning be given priority for inclusion in the INTELSAT R&D program for 1978.
- Approved revisions to the performance characteristics for Standard A, B and C earth stations, adopted a 1.25-MHz/12 channel carrier as standard for Standard A and C stations working with INTELSAT V satellites; and adopted a 2.5 MHz/48 channel carrier as a standard carrier for Standard A stations with all satellites and Standard C stations with INTELSAT V satellites.
- Approved revisions to the earth station operating procedures concerning criteria to limit off-beam radiation from earth stations using leased capacity, and approved transponder definitions and operating constraints as guidelines to be used with leased systems in INTELSAT IV or IV-A global transponders.
- Requested the Director General to study the detailed aspects of equipment compatibility of SCPC delta modulation techniques with the existing earth stations operating in the SCPC/PSK mode, and to provide for the next meeting of the Advisory Committee on Technical Matters an analysis of the replies received to the questionnaire on potential demand for Standard B stations.
- Noted the report of the Advisory Committee on Technical Matters on intersystem coordination guidelines and criteria and its view that these are suitable for continued use by the Director General in conducting discussions with other entities concerning intersystem coordination.
- Approved a reduction from five to 2.5 in the rate adjustment factor for the NASA Ship *U.S. Vanguard* earth station when operated in the FDM/FM mode, and upon verification of a 31.7 G/T antenna performance.
- Approved, subject to operating restrictions, a non-standard station at Punta Arenas, Chile, to provide domestic communications with the leased capacity and occasional-use television services, and two transportable Saudi Arabian stations, which are being upgraded from 4.5- to six-meter antennas, to work with Saudi Arabia's leased capacity.
- Approved a non-standard station in Uganda subject to: review by the Advisory Committee on Technical Matters; conversion to Standard B operation by December 1, 1977; and a rate adjustment factor of 2.5 for FDM/FM telephony which is also limited to a single destination.
- Extended until December 1977 approval for the Japanese nonstandard station at Yamaguchi for access in the receive-only mode free of charge, to continue depolarization experiments and demonstrations on a non-interference basis.

Financial and Legal Matters

- Authorized the Director General to make contractual arrangements for provision of INTELSAT TT&C support for non-INTELSAT launches under the terms and conditions established for previous such uses, and established a per-launch charge of $130,000 in 1980 and $140,000 for launches in 1981.
- Decided to reinstate $71,000 in project funding under task 211-2193 in the 1977 budget, for studies of new modulation and multiple access techniques.
- Adopted on a provisional basis revised procedures for implementation of Article XIV(d) requirements concerning significant economic harm, and revised Article XIV procedures for the assessment of technical compatibility between INTELSAT and separate systems and noted that the Director General intends to apply guidelines in recording intersystem coordination agreements.

The Twenty-ninth Meeting of the Board of Governors will be held in Washington, D.C., in September.

The preceding report was prepared by Ellen D. Hoff, INTELSAT Affairs, U.S. INTELSAT Division.

Gruner receives research award

Robert W. Gruner, left, receives the 1977 COMSAT Labs Research Award from Labs Director B. I. Edelson for work significantly advancing the state of the art in earth station and satellite polarizer network design. Gruner's designs have been employed in the INTELSAT IV-A polarization experiment achieving a 0.1 db maximum axial ratio over the respective 500 MHz bandwidths. According to Dr. Edelson, "The excellence of his developments has been recognized by the communications industry in a particularly meaningful way, that of licensing for production."

Daughter of Labs' Perry wins scholarships

Donna Marie Perry, 17, daughter of Donald Perry, Applied Sciences Lab, and Mrs. Perry, is a recent Honors graduate at Middletown High School, Middletown, Maryland. Miss Perry graduated first in her class of 168 in recent ceremonies at the Frederick County School, with a straight 4.0 (A) average.

Not too surprisingly, she is the recipient of several scholarships. The Maryland General State Scholarship pays her $700 a year for four years; Mt. St. Mary's College scholarship also pays $700 a year for four years; the Middletown Lions Club awarded her $500 for her academic achievement; and the Burkittsville, Maryland Ruritan Club also provided $500. Donna has been accepted at Mt. St. Mary's College in Emmittsburg, Maryland, where she plans on pre-med studies.

Donna was a member of the National Honor Society in high school, and represented her school at Girls' State in her junior year. She appeared in her school production of "Bye, Bye Birdie" and served on several scholastic committees. In her Senior year she took Freshman English at Frederick Community College for two semesters, receiving B's for her efforts.

Although Donna spends a good bit of time studying, she likes to play tennis in leisure moments. After earning her B.S., Donna hopes to go on to Medical School and eventually become a pediatrician.

—Shirley Taylor

CEA GOLF *(Continued from page 5)*

	Montgomery Golf Course (F)	***Bretton Woods Golf Course (F)***
	David E. Burks (M)	David E. Burks (M)
	Frederick N. Ormsby (H)	James A. Hall (H)
	Frances Kline (M)	Dolores C. Anderson (M)
1974	***Bretton Woods Golf Course (S)***	*1977* ***Bretton Woods Golf Course (S)***
	David E. Burks (M)	John A. Donahue (M)
	Marvin S. Bowser (H)	Frederick J. Seidel (H)
1975	***Bretton Woods Golf Course (S)***	Dolores C. Anderson (M)
	David E. Burks (M)	
	C. William Sims (H)	
1976	***Bretton Woods Golf Course (S)***	M—Medalist (low gross)
	Marvin S. Bowser (M)	H—Handicap (low net)
	David E. Burks (H)	S —Spring
	Dolores C. Anderson (M)	F —Fall

Departments experiment with "Flexitime"

"Flexitime," an experimental program allowing employees within COMSAT to choose their own working hours providing "core time" hours are maintained, has been implemented for the period June through September.

COMSAT functions involved in the experiment are Accounting, Audit and Management Systems, Financial Planning and Control and Headquarters Personnel. According to COMSAT President Joseph V. Charyk, the success of the Flexitime trial will depend on how well all employees and management cooperate so that the expected quality of work is maintained.

Flexitime allows employees to choose their own start and stop times providing three requirements are met: the employee must be at work each Monday through Friday from 10 a.m. to 11:30 a.m. and 2 p.m. to 4 p.m. (core time); account for a minimum of 38.75 hours each week including time worked plus authorized absences; and participate in any required minimum staffing levels.

The implementation of Flexitime reflects management's feeling that emphasis should be placed on the job employees are expected to do rather than on the time of the day it should be done. The elimination of the requirement to be at the office from 9 a.m. until 5:30 p.m., in those cases where work schedules permit, allows employees time for personal business without asking for time off; balancing work time with work load; avoidance of rush hour frustrations; and late starts or early departures if desirable.

Under Flexitime a typical work week could range from five to ten hours on any given day providing the minimum work week of 38.75 hours was complied with.

Vi Sepper, Personnel Office Receptionist, logs in on Flexitime Recorder during experimental program.

CEA

(Continued from page 3)

1973

The Fishermen of COMSAT made it out to the Chesapeake Bay during the summer of 1973. Eighteen boats of eager "fisherpersons" spent the day catching, and (one must pay for fun times) cleaning fish. It was the first employee-sponsored fishing trip, and it proved to be quite a success.

1974

The first big trip of the Ski Club took place in early 1974. About 100 skiers hit the slopes (literally, we're told, in some cases) of Blue Knob Resort in Pennsylvania. After the spring thaw, the Garden Club took advantage of the nice moist soil and set out to see how many had green thumbs. At year's end, farmers and skiers, along with volleyball and football players, met at Loew's L' Enfant Plaza Hotel to celebrate the holidays. It was a good year.

1975

The first order of business for 1975 was the election of officers for the year; the results: William Schafer, president; Lou Early, vice president; Sandy Fox, secretary and Donna Higgs, treasurer.

Leaving behind the dreary Washington winter, about 40 employees and their families took off to Hawaii for an unforgettable eight-day vacation in February. Some points of interest visited included the *USS Arizona* Memorial at Pearl Harbor, the Dole Pineapple Plantation, the Polynesian Cultural Center, and, of course, the Paumalu Earth Station.

During the summer the Motorcycle Club gave instructions on safety tips and proper handling of bikes. Some areas covered included gear shifting, throttle and clutch control, stopping and maneuvering.

The year ended with the CEA donating a wide assortment of toys to Children's Hospital, helping the young patients to have a happier holiday.

1976

During the highly commercialized bi-centennial year, CEA activities took a back seat to the headlines of the year but they continued to provide the fun and fellowship that had grown to be expected from the ongoing social, recreational and educational activities that have become an integral part of COMSAT employee life.

CEA has been a very beneficial and necessary part of COMSAT. It has made available to employees outlets otherwise beyond the reach of many—charter trips, ski outings, etc. The numerous clubs fostered by CEA have developed talents and interests of many, and encouraged equally as many to "try it," to develop a new interest, a hobby. Through the CEA, the person who had never skied, dared to take that first run down the slope; a novice fisherman remembers the first catch; weekend athletes live for the softball, volleyball and basketball games.

The CEA got off to a great start a decade ago. The clubs now have very active memberships—it's always nice to have a bigger crowd around. In this issue of PATHWAYS we have covered the history and activities of the CEA in considerable detail. We hope that this will inspire you to participate more actively in one or more of the clubs and that you will keep alert for announcements of upcoming events.

Ski Club

The COMSAT Ski Club is open to all members of the CEA who like to ski or think they'd like to try. Last season the club sponsored one-day trips to Bryce Mountain, Virginia, and Blue Knob, Pennsylvania, and a three-day ski weekend over the Washington's Birthday holiday at Seven Springs, Pennsylvania. Membership for the 1976-1977 season reached 56, including 18 first-timers. Dues are five dollars per person per season, and entitle members and their families to reduced rates for transportation, equipment rental, and lift tickets on club-sponsored trips.

In an effort to keep members active during the "off" season, the club is working on organizing some summer events, including a possible white-water float trip on the Youghiogheny River in Pennsylvania. Although efforts so far have been unsuccessful, it promises to keep trying.

Boating Club

The purpose of the Club is "to provide convenient means for boating at economical rates for its members" and "to offer training and educational instruction in the skills of seamanship and safety."

Since its founding in 1971, the Club has acquired two sailboats. The first, in 1971, was a 17-foot Mobjack class sloop. The Mobjack is kept at the Dangerfield Point Sailing Marina (between National Airport and Alex-

(Continued on next page)

CEA *(Continued)*

andria). The second was a 17-foot Daysailer class sloop, acquired in 1973. The Daysailer is kept at Washington Marina (near L'Enfant Plaza).

The members share the use of the boats by reservations made with the

Club Secretary. Because there are two boats to choose from, it is very seldom that a member is unable to reserve a boat on a day of his choice. The sails and other equipment for each boat are stored with the boat, so rigging up for a sail is simple and convenient.

In addition to the cooperative sharing of the boats for individual enjoyment, the Club has regularly sponsored sailing practice sessions. The Mobjack is also available for use by members in the sailboat races which are regularly scheduled throughout the summer. The Club's experienced sailors have traditionally provided coaching for the less-experienced members. Members who are completely new to sailing are encouraged to participate in the excellent sailing classes provided by the local Red Cross chapters.

Membership in the Boating Club is very inexpensive, currently $25 per year. There are no additional usage fees, so the price of the dues is made up in one or two trips per year when compared against rental fees (the alternative to Club membership if you don't own your own boat).

Radio Club

The COMSAT Amateur Radio Club was founded in 1968 and club station WA3LOS was located on the 5th floor of 2100 L Street. The first president was Perry Klein. WA3LOS was moved to the Clarksburg Laboratory building in September 1969. Equipment was obtained for a second station WA3IGQ, at L'Enfant Plaza in 1970. Equipment for both stations was obtained using funds donated by the CEA and augmented by loans of individually owned equipment. Today the club numbers 37, all members of CEA.

The club's main activity has been participation every year since 1969 in the annual nationwide Field Day contest which is oriented toward operation under emergency conditions. Club scores have been consistently in the top 25% of entries and in 1972 was the highest-scoring 4-transmitter entry in the third call area (Pennsylvania, Maryland, and Delaware).

Other activities have been satellite oriented. Seven OSCAR (Orbiting Satellite Carrying Amateur Radio) satellites have been launched to date by amateur organizations. The club monitored and decoded telemetry information from OSCAR 5. A large number of contracts with other amateurs have been made using OSCAR 6 and 7. OSCAR 7 performance was tested at COMSAT Labs and the OSCAR 6 Transponder was assembled by W. Mercer.

J. Kasser of the club assembled an OSCAR ground terminal which was presented to the World Scout Committee as a donation from COMSAT.

Operators at WA3LOS have also qualified for the coveted DX Century Club (DXCC) award which requires contact with at least 100 countries.

Music Club

The COMSAT Employees Association Music Appreciation Club is entering its second year. The Club was established in 1976 by Les Cameron and Don Flora to add a new dimension to Plaza life. Since its inception, the Club has blossomed into a real winner.

Through the Club, many aspects of the world of music can be explored. Best known is the choral group which has entertained at the Plaza on many occasions. For music lovers who would rather accompany than sing, guitar classes are available. Workshops in fundamental theory are held periodically.

Art Club

The COMSAT Art Appreciation Club, founded in 1976, encourages budding artists to develop their talents. Meetings are held in the fifth floor conference room (5094) from noon to 1 p.m. For an hour the conference room is transformed into an art studio. Occasionally, trips are taken to nearby points of interest for sketching exercises.

Brenda Smith, founder and instructor, guides members through a series of drawing exercises, beginning with contour drawing emphasizing line variation and development for object drawing, to more complex figure drawing. Membership is open to anyone with minimum art skills.

Picnic '77

More than 800 adults and children enjoyed a fun-filled afternoon and consumed enormous quantities of food and beverages during the CEA's annual summer picnic at Smokey Glen Farm.

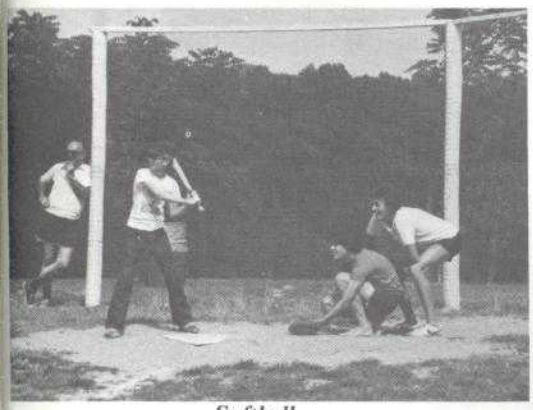
There was a little something for everyone as far as games and entertainment were concerned. Chuckles the Clown provided hours of fun and tricks for the young. Ponies carried the youngsters around. A strolling barbershop quartet offered a "musical interlude" during lunch.

To work off the calories from all the food, many picnickers took part in one or more of the "vigorous" activities of the day—soccer, basketball or softball. For the less energetic, horseshoe-pitching was a relaxing way to exercise. As in every group, there were some hyperactive people (usually children who haven't yet learned the value of conserving energy); they enjoyed the over-exhausting activities. For them, sack races were heaven on earth.

But not everyone took part in planned activities. It was a lovely, lazy afternoon and the setting was perfect for just plain relaxing. And that is just what a lot of people decided to do. But regardless of what one was doing, it was a great day, as the accompanying photos prove beyond a doubt.

A day of fun and games

Photos by Mike Glasby



Softball . . .

a kick for soccer . . .

volleyball . . .

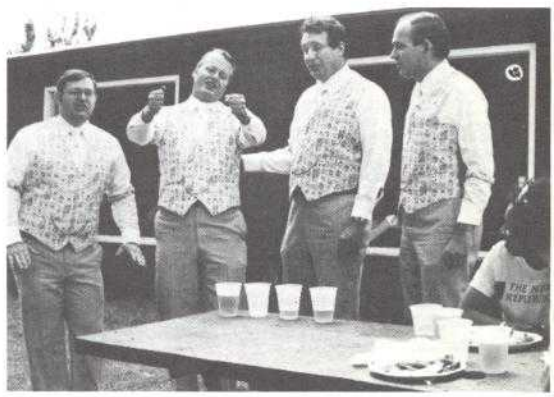
pony rides . . .

first-place in horseshoes . . .

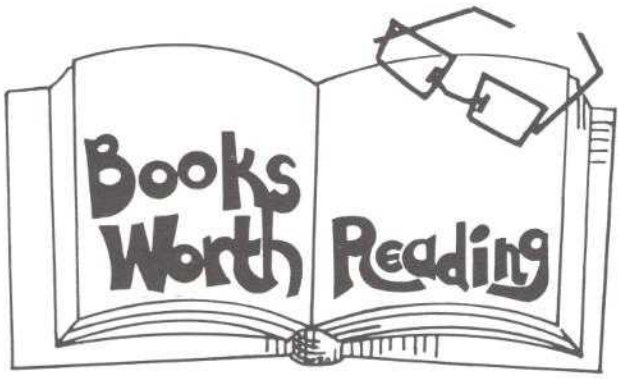
sack race . . .

watermelon eating contest . . .

Chuckles the Clown . . .



and the Barbership Quartet.



Communications Satellite Systems: An Overview of the Technology, *Ed. by* GOULD, R. G., *and* LUM, Y. F.—*IEEE Press publication distributed by John Wiley & Sons, Inc., New York, 1976, 189 pp., illus., $15.00.*

Technical advances of communications satellites and their impact on worldwide communications during the past decade have been reported mostly in periodicals and conference proceedings. The rapid evolution of the art has made it difficult to write books on the subject without risking almost immediate obsolescence. Therefore, aside from a few volumes, mostly tutorial, on the more general subject of space communications, the majority of the books published about satellite communications so far have taken the form of collections of papers on the various parts and aspects of satellite communications systems, written by specialists and coordinated by one or two editors. For example, seven volumes of the *Progress Series in Astronautics and Aeronautics* dealing with satellite communications, have been published during the past decade under the sponsorship of the AIAA.

Communications Satellite Systems: An Overview of the Technology follows a similar pattern. The book is prefaced as an updated version of a 1972 IEEE publication prepared by the Satellite Systems Committee of the Aerospace and Electronic Systems Society with the title, *A Review of Satellite Systems Technology.* Unfortunately, imbalances in the treatment of the various parts of the book are noticeable, as well as cases of quasi-repetition from the previous technical literature.

In a 72-page section on "Communication Satellite Systems," the treatment of several systems is quite brief, and six of the 13 contributions carry no references. Where references are given, they are often incomplete and not recent enough.

The first and third parts of the 15-page section on "Techniques for Expanding Communications Satellite System Capabilities," which deal, respectively, with the important topics of "Modulation" and "Multiple Access and Techniques for Frequency Reuse," are disappointing because they are extracts from the above-mentioned 1972 IEEE publication, with little or no effort made to update or implement the presentation. The second part, on "Frequencies Above 10 GHz," reflects more recent work and carries an extensive, although incomplete, list of references.

A 17-page section on "Frequency and Orbit Coordination and Utilization" is made up of three brief parts —"System Coordination," "Orbit Utilization," and "Tools for Quantitative Analysis"—by a single author. It ends with a condensed report on the results of the 1971 World Administrative Radio Conference for Space. This report is identical to that which appeared in the above-mentioned 1972 IEEE publication. Again, the lack of appropriate references is noticeable.

"Earth Station Technology" is treated in eight pages, in a mainly descriptive manner, with the intent to cover the period from 1962 to 1974.

Certain aspects of the "Integration of Satellite and Terrestrial Networks" are also discussed. References are few and rather old. In the introduction to this four-page section, the number of countries participating in the INTELSAT System is incorrectly set at 53 (the actual number is 95).

The final 21-page addendum is a collection of data in tabular form pertinent to sundry NASA Satellite Programs.

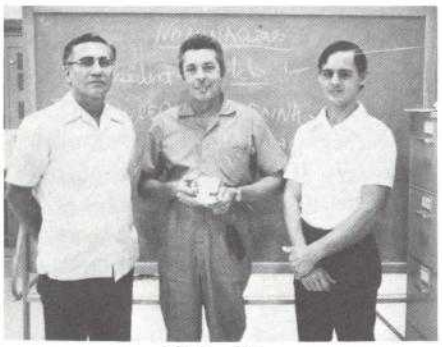
Notwithstanding the above criticism, to the best of this reviewer's knowledge this is the only volume in which so many diverse communications satellite systems are described under one cover. Many readers, mainly among the nonspecialized, will find it useful, especially if used in conjunction with the companion volume, *Literature Survey of Communications Satellite Systems and Technology* by J. H. W. UNGER, with over 3600 references, which provides guidance to a very extensive literature.—**Pier L. Bargellini,** *Senior Scientist,* COMSAT *Laboratories*

Network Bits

Field Correspondents

Andover
Joanne Witas
Brewster
Dorothy Buckingham
Cayey
John Gonzalez
Etam
Bev Conner
Fucino
Sandy Tull
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

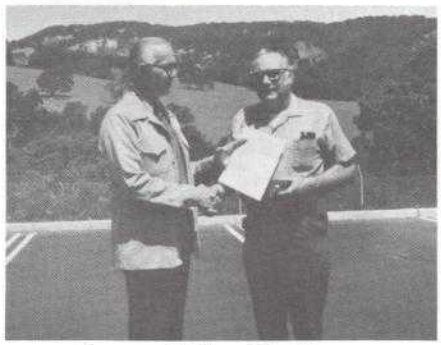
CAYEY. New officers were elected recently at the Cayey Employees Association Annual Meeting. Shown in the above photo are, left to right, CEA Secretary **Luis Medina**, President **Paul McGranahan** and Treasurer **Ralph Camacho.** The meeting, held in the Operations Room and presided over by Station Manager **Luis R. Rodriguez** (photo below) was preceded by a lunch in the Station Lounge prepared by **Mrs. Otto Irizarry.** A busy schedule of activities has already been developed by the new officers. **—John Gonzalez**



CEA officers

CEA meeting

JAMESBURG. Walter D. Robinson, Facilities Engineer, is the third of Jamesburg's original employees to receive COMSAT's ten-year Service Award. In the accompanying photograph, Robinson receives his ten-year service ring and certificate signed by COMSAT President **Charyk** from Station Manager **John P. Scroggs.**



Scroggs (left) and Robinson

The Employees Association (JCEA) held its annual summer picnic at Toro Regional Park in Salinas in June. The highlight of the festivities was the introduction of an old French game called Petanque (pronounced peetunk) by Walt Robinson. **—C. B. Marshall**

LABS. Former temporary employees **Blanche Reid** and **Carolyn Daganhardt** are now permanent. New Lab employees are **Robert Whiteley,** Microwave Lab, and **Steven Struharik,** Transmission Systems Labs. INTELSAT Nominees joining the Labs are **J. Brandao** and **T. Noguchi. Its'hak Dinstein** returned to Israel on a leave of absence. **Frank Mann** transferred to SBS.

Vacationers were so numerous that only the names of those vacationing will be carried here: **Dick Arndt, Dick Porter, Joe Tyler, Virginia Hott, Gene Carlson, Bernie Schmell, Paul Koskos, Larry Sparrow, Wanda McKinley, Marianne Merrihew, Ed Rittner, Diane Lusby, David Kreutzer, Remy Edy, Kevin Hodson, Joe Campanella** and **Tom Kirkendall.**

Norma Broughman is attending a two-week school in Michigan on a scholarship from her Credit Union. The **Barbara Reader** family has a new addition, son **Robert Ryan** born July 10. **Cris Inman** attended her 45th Class Reunion while on vacation in Massachusetts. She also spent a week in Louisville, Kentucky, attending the Business and Professional Women's Convention.

Paul Fleming's daughter **Tara** married **Don Anderson** July 23. **Jim Allison** and **Art Cornfeld** have moved into new homes. **Dr. James Su** completed 10 years with COMSAT. **Keith Bagot** is completing an 18-month tour as an INTELSAT Nominee and will return to the Royal Aircraft Establishment in Farnborough, England. **Hal Gerson** has returned to work after being laid up for three weeks—the result of a fall.

Howard Flieger has been elected for a two-year term to the Council of the AIAA National Capital Section. **Tom Kirkendall** has been elected Chairman of the Baltimore-Washington Section of the Society for Applied Spectroscopy.

The Labs Softball Team finished in third place with an 11-9 record and will be entering the league playoffs. It was reported that **Doug Stewart** was captured by enemy forces while on Reserve military maneuvers in upper New York State (we still have not figured out how a cook gets captured). **Bud Bell** in explaining the bandage on his arm says the ground attacked his five iron while hitting his golf ball.

(Continued on next page)

John Sickel is recuptering from a back operation. **Fred Smith** is wearing his arm in a cast but we hesitate to ask how he got it. **Bill Windell** entered Johns Hopkins Hospital for an operation. —**B.P.S.**

M&S CENTER. Bill Peck reentered the hospital for additional surgery but is now back at work and it looks like work on the library will be completed by the end of July. **Jim Vinneau** also underwent surgery on his shoulder but is now back at work in the Cryo Shop.

George Hannah and **Don Rounsaville,** Calibration Team members, are making their yearly visits to Southbury, Andover and Mill Village, Nova Scotia, to test equipment calibration.

Jeff Sedgwick's vacation plan calls for 10 days in Bonaire, Netherland Antilles, to take in some of the best Caribbean scuba diving. Jeff gave us a rundown on the spot he's selected. Bonaire is unique in many ways: all drinking water is desensitized sea water, it has a population of 8,000 flamingos, 60 to 100 yards from the shore the water's depth drops to several thousand feet, the horizontal visibility of the water averages 150 feet and the mean water temperature is 82 degrees. On the other side of the coin, Bonaire is as arid as New Mexico and comes complete with lizards and iguanas. Much of the architecture goes back 200 years and yet the people there are as contemporary as any others in the world. Jeff plans to document his vacation thoroughly taking along 50 rolls of film.

For a rundown on M&S vacationers: **Lee** and **Angus Bolinger** spent a few days in Florida, then on to Tennessee with sons **Paul** and **Pat** (Pat is registering at the University of Tennessee and Lee's mother lives in Maryville); **George** and **Ellen Robertson** had three weeks of sun and surf on the beaches of North Carolina; **Barbara** and **Hugh Hutchens** went state park trailer camping for 10 days including the July Fourth weekend; **Floyd** and **Betty Jo Thompson** vacationed for five days in West Virginia; **Bob** and **Christa Riblet**'s son **Bob** took 10 days leave from Warren Air Force Base in Wyoming to spend with his parents in Blue Ridge Summit, Pennsylvania; **Pat Ross** with husband and son **John** and daughter **Janice** made a camping trip through the states of Texas and California with stopovers at the Grand Canyon, Las Vegas, Yellowstone and other points of interest and returning via the central route.

A welcome aboard to **Judy Ahalt** who has assumed the position of Senior Clerk at the M&S Center.

—**Darleen Jones**

PAUMALU. The annual Summer Family Picnic for Paumalu employees and their families was held in July at a private beach home in Waialua. This year's outing was arranged by members of Operations Team 2 and attracted 75 adults and children. Games for children, swimming, movies, and lots of food and refreshments were enjoyed by all who attended the picnic. Officers of the Paumalu CEA include: **Tom Akimoto,** President; **Ronald Miyasato,** Vice-President; **Allan Prevo,** Secretary; and **Gilbert Estores,** Treasurer.

During June, passersby on Highway 83 near the Paumalu station saw the PAM-II antenna pointing to the zenith as contrasted to the familiar southwesterly direction. The antenna downtime was required to permit painting the reflector and sub-reflector. All communications traffic was temporarily transferred to the PAM-I antenna during this period. Three members of the Facilities group, **Castor Corpuz, Eddie Clarke,** and **Bill Romerhaus,** worked alongside two painters hired from a local contractor, to successfully complete the week-long project. Since being designated as this station's primary antenna, this downtime represented only the second time that PAM-II has been down for major maintenance since entering service in 1968.

Summer, synonymous with vacation and travel, has meant just that for several Paumalu employees. This year's out-of-state vacationers included **Eddie Clarke** and his family journeying to Disneyland and other fun spots in California; likewise for Senior Technician **Cenon Usita,** his wife and two daughters. Logging over 10,000 miles on his vacation was **Joe Chow,** who visited his birthplace, Toronto, to spend time with his parents, relatives, and friends. Interisland travelers included Senior Technician **Tom Kaneshiro** and his family, exploring the volcanoes on the Big Island of Hawaii; **Lily Miram** and her husband, spending two weeks on Kauai; and **Eddie Miyatake** and his family taking in the sights of the Big Isle.

Senior Technician **Yoshiaki Daikoku** recently returned from five days of active duty training at Hickam Air Force Base. Senior Master Sergeant Daikoku is a member of the Hawaii Air National Guard and is the only active reservist at Paumalu.

—**Bob Kumasaka**

PLAZA. John and Gail McManus are the parents of twin girls **Kelly** and **Colleen** born June 29 at 11 a.m. **Kelly** weighed in at five pounds, 13 ounces, while **Colleen** tipped the scale at a hefty eight pounds, one ounce. The twins are really all-COMSAT babies: John is Accounts Payable Supervisor in Finance; until recently their mother was secretary to **Irv Dostis;** and their maternal grandmother, **Rosemary Davis,** was secretary to **Denny Neill. Bob** and **Yvonne Stokes** (Personnel) have a new son, **Jamal Kareen Stokes,** born on July 13, and weighing in at eight pounds, seven ounces.

Personnel's **Mel Williams** reports on a class reunion that turned into a family reunion also. Since the sixteenth high school reunion in Memphis, Tennessee, included members of the graduating classes from 1959 through 1963 (among them, two of Mel's brothers), the Williams family

decided it was a great opportunity to hold a family reunion at the same time. —**Gloria Lipfert.**

SOUTHBURY. One-year anniversary congratulations are in order to **Rose Marie Eureka,** MARISAT Communications Operator, and **Mike Masse,** Communications Technician. **Roger Miner** has returned from a temporary assignment to Fucino, Italy. **Dolores Raneri,** MARISAT Communications Operator, and her husband **Paul** visited the Washington area and thoroughly enjoyed the welcome and tour provided by COMSAT GENERAL personnel.

Jim Nelson, Facilities Technician, recently supervised and participated in a weekend scout trip down the Delaware River, each paddling a canoe. Vacationers included **Ms. Eureka** who visited Cape Cod and who, unfortunately, took rain with her; and MARISAT Operator **Annabelle Lyle** and family who spent a few weeks in Florida.

—**Eileen Jacobsen**

At Presstime

Navy extends MARISAT contract

The United States Navy has agreed to extend its use of each of the three satellites in the MARISAT System for an additional two and one-half years, ending in 1981.

Payments for service provided during the full term of the agreement will total approximately $138 million if the MARISAT satellites located over the Atlantic, Pacific and Indian Oceans continue to operate satisfactorily. Payments under an earlier agreement would have totaled approximately $83 million.

The MARISAT System began providing communications service to the Navy 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 is owned by four companies under a joint venture arrangement approved by the Federal Communications Commission (FCC). COMSAT GENERAL Corporation holds an 86.29 percent ownership interest and also serves as System Manager.

FAA Cancels Aerosat RFP

COMSAT GENERAL has received notice from the Federal Aviation Administration (FAA) that the FAA has cancelled its Request for Proposal (RFP) to COMSAT GENERAL for Aeronautical Satellite (AEROSAT) Communication Services.

As a result of this notification, it has been decided to write off in July accumulated deferred aeronautical satellite system costs of $5,300,000, which amounts to $2,730,000 after taxes. It had been planned to amortize these costs over the five-year term of the agreement for AEROSAT services contemplated by the RFP.

In its letter to COMSAT GENERAL, the FAA noted that Congress this year had not authorized the Agency to procure communication services from COMSAT GENERAL and, further, that Congress had deleted the bulk of funds earmarked for the AEROSAT Program from the Agency's fiscal 1978 budget. Instead, Congress requested the FAA to initiate a feasibility study of the program.

The RFP had been issued following the execution in 1974 by the FAA, the European Space Agency (ESA) and the Government of Canada of an intergovernmental Memorandum of Understanding (MOU) to establish an aeronautical satellite program.

Following execution of the MOU, COMSAT GENERAL subsequently was selected from among several competitors to become the U.S. partner with ESA and Canada in a co-owners' arrangement providing for establishment and operation of the satellites and related ground control facilities which would be utilized in the AEROSAT Program. The MOU further provides that the FAA would obtain aeronautical communications capacity from the U.S. partner (COMSAT GENERAL) pursuant to an appropriate contract. It was for the purpose of negotiating and concluding this contract arrangement that the FAA had issued its RFP.

The objective of the AEROSAT Program is to test and evaluate communications via satellite between the ground and aircraft in flight on transatlantic routes for improved air traffic control and air carrier communications.

The Royal Viking Sea is calling...

One of the world's most modern cruise ships uses the world's most modern communications.

Passengers aboard the 22,000-ton Royal Viking can call home with ease. Via MARISAT. The remarkable new maritime satellite system, developed by COMSAT General, that links ships and offshore facilities with shore points anywhere in the world, 24 hours a day, every day.

Now, from stateroom to home. The Royal Viking Line, operators of the modern 500-passenger Norwegian cruise ship, have linked the COMSAT General MARISAT terminal on board to the ship's internal communications. Passengers can telephone, or send a telex message, direct via satellite from their staterooms.

No delays, reliable. Unlike conventional marine radio, MARISAT communications are fast, private, virtually unaffected by weather or ionospheric disturbances. MARISAT is connected with the worldwide commercial networks, so you get there, anywhere on earth, with the same speed and quality as land communications.

COMSAT General is the *only* company which provides MARISAT telephone, facsimile and data communications. And the company has the largest number of telex channels for quick access.

Compact terminals. COMSAT General has the mobile terminals specifically engineered to operate with MARISAT. They're in service now on ships and offshore facilities flying the flags of more than a dozen different countries—from luxury passenger liners to tankers, tuna boats and oil drilling rigs. Compact economical to operate, they are available now, for lease or purchase, for immediate installation on your ship or offshore facility.

Cost-effective communications. In addition to passenger use, the Royal Viking Sea uses MARISAT daily for all types of company communications—to send ship operating data to her home offices in Oslo, to book passenger reservations, to arrange for pilots at some ports of call, to order fuel and supplies in advance, minimizing delays. She is the first to make high quality MARISAT communications available to passengers aborad ship.

Shouldn't your company be looking at ways to use the benefits of MARISAT? For more information about COMSAT General's MARISAT services, and how we can tailor them to meet your company's specific needs, call:

Washington 202/554-6070
New York 212/757-6307
Houston 713/777-1359

COMSAT GENERAL CORPORATION
950 L'Enfant Plaza, Southwest Washington, D.C. 20024
COMSAT General-Communicators to the maritime world

September/October 1977
Volume 2 Number 5

SATELLITE Pathways

Solomon Run: Public housing

Tanneryville: Cooper Avenue

Seward: Trailer court

Hornerstown: Fronheiser Street

Dale: Bedford Street

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COMSAT GENERAL CORPORATION

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CONTENTS

Cover. *A pictorial spread taken from the special flood edition of the Johnstown* TRIBUNE-DEMOCRAT *with photos of the* COMSAT *antenna and Red Cross Operation Center deployed in the aftermath of the flood.*

Experiment for Computers

New techniques are being developed for high-speed, computer-to-computer communications via satellite

By Dr. William L. Cook

Between a parking lot in LaGaude, France, and a rooftop in suburban Maryland, a surface distance of more than 4,000 miles, two antennas carry on a conversation at 1.5 million bits per second through a French-German Symphonie satellite in orbit over the Atlantic Ocean. The "voice" behind each of the antennas is an IBM 370/158 computer.

The objective of the exchange is the development of techniques applicable to direct, high-speed, computer-to-computer communications by satellite.

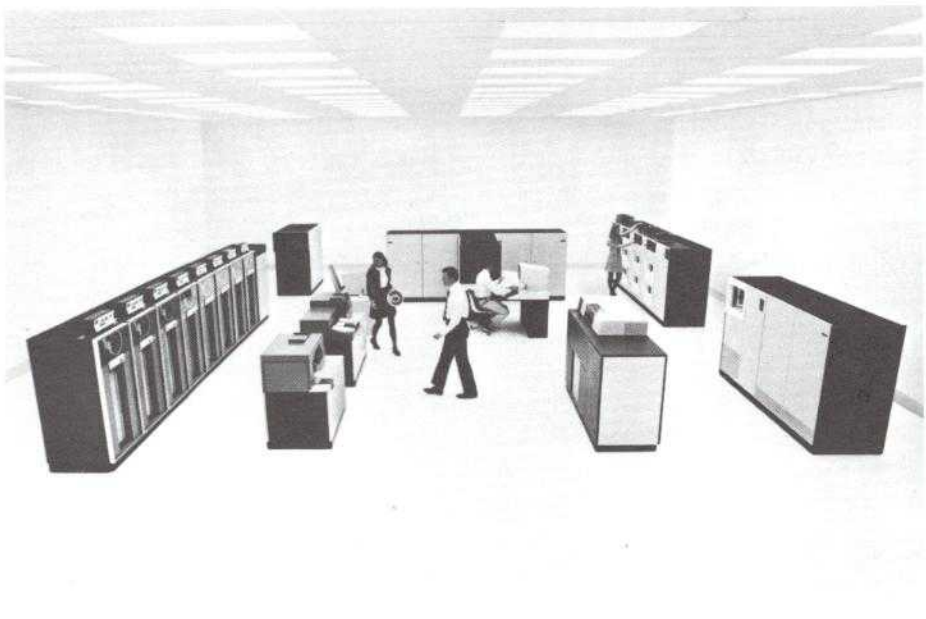
International in effort, the experiment utilizes an earth terminal at IBM's LaGaude Research Center provided by the French Ministry of Posts and Telecommunications (PTT), a Comsat Labs antenna mounted atop the IBM Building in Gaithersburg, Maryland, the Symphonie satellite, and IBM computers at each site.

Dr. Cook is Manager, Computer Systems Development, COMSAT Laboratories, Clarksburg, Md.

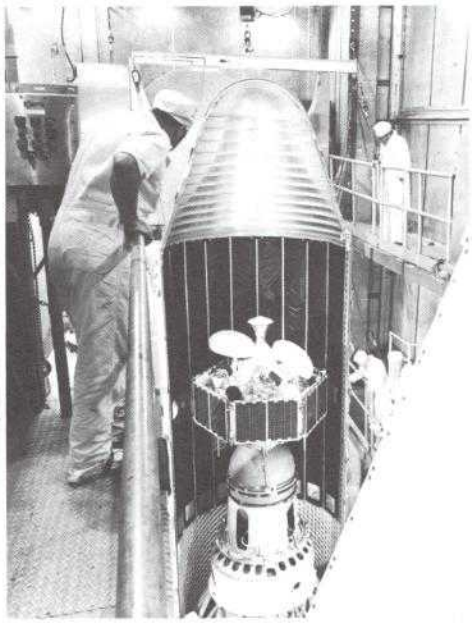
The role of satellites in international communications has traditionally been to provide voice-quality circuits for telephone communications and some television transmission. A small percentage of the telephone circuit capacity has been used to transmit data in digital form, a form directly readable by general purpose computers or other automatic data processing equipment. However, it is only recently that the possibility of allowing computers at distant locations to communicate directly through a satellite link has been explored.

Data communications has become a multibillion-dollar business with an impressive annual growth rate. It is estimated that the number of data communications networks at the present time in the United States alone is approximately 2,500.

Current cost trends indicate that the use of paper as a means of storing and transmitting information will rapidly become less economical than electronic means. For example, facsimile transmission and electronic mail will soon be more economical than letter delivery, and in fact, there will be strong incentive to automate the entire information processing operation in most business applications. Hence, keyboard terminals attached to cathode-ray tubes (or television screens) will replace file cabinets (and libraries), and high-speed printers will replace office copiers. Almost all conceivable types of business transactions, from electronic funds transfer to inventory control to credit card billing and paying, will eventually be processed by computers and computer networks.



The IBM 370/158 Computer



The Symphonie Satellite

Impact of Satellite Communications

Data currently being transmitted in computer networks consist of "small" messages (less than 1,000 bits), often generated on an intermittent basis—one message every several minutes. Typical applications include electronic funds transfer, recording of sales transactions, credit checking, and airline, hotel and rent-a-car reservations. Maximum throughput is limited by the capacity of the voice-grade telephone lines which are used, consequently, data rates cannot exceed 2,400 or 4,800 bits per second and are often considerably lower.

The experiment being conducted by IBM and COMSAT is demonstrating that it is feasible, through the medium of satellite communications, for large general-purpose computers to communicate at speeds approaching the internal operating speeds of the computers themselves. This means that not only can massive quantities of data be transferred in short periods of time, but also that the computers can interact in a way which was formerly possible only when the computers shared the same room or building.

Often direct connections are made between two or more computers for the purpose of load sharing (*e.g.*, transferring computer programs from one site to another site for execution) or data base sharing (*e.g.*, maintaining a large data base at a single location which is accessible to users at other locations).

Load sharing via satellite might be economically feasible in any one of several situations. For example, if one computer at Location A has an extremely heavy workload during certain periods of the day, it may be more efficient to transmit some jobs by satellite to an idle computer at Location B for processing and then return the results to Location A, than to add additional equipment at Location A or to accept the inevitable delays. This might be particularly attractive where the two computers are in substantially different time zones, as would be the case between Gaithersburg and LaGaude, since the computer workload falls off considerably in the night-time hours. Load-sharing by satellite might also be employed when the data on which the job operates is at a distant location, or when special computing resources are available only at a distant location. Numerous other practical applications are foreseen, including the maintenance, updating or dissemination of data bases, and the distribution of new software products.

"Data bases" are large collections of stored information. Examples are numerous, and include employee records, accounting information, bank account status and history, billing information, parts inventories, work backlogs, and airline reservation data.

A common characteristic of many large data bases is that they are constantly being modified or consulted, typically on a minute-to-minute basis (as in airline reservations or retail sales monitoring), or on a daily basis (as in inter-bank funds transfers). For low data transmission rates, such as those available through terrestrial telephone lines, only minor modifications can be made in each transaction and only small portions of the data can be retrieved. However, the availability of high transmission rates via satellite makes possible the transfer of entire data bases, consisting of millions of data entries, in a matter of seconds or minutes to one or more remote locations. Thus, identical data bases can be maintained simultaneously at different locations, which would make them more accessible to the end users by reducing the lengths of the communication paths, and would provide a backup in the case of catastrophic failure. It would also mean that software products (computer programs) which typically consist of millions of bits of information could also be transmitted quickly and accurately between distant locations. Large programs, such as system programs maintained by computer manufacturers, are constantly being modified and corrected and new versions are released on a periodic basis.

Appearing on the adjoining page are, (1) a drawing demonstrating the computer-to-computer experiment between the United States and France, (2) photos of the Labs antenna atop the IBM Building in Gaithersburg (lower left), and (3) the LaGaude terminal in France (lower right).

Several important points can be made concerning the potential impact of satellite technology on computer-to-computer communications as compared to terrestrial communications facilities:

- The first is that, heretofore, broadband communications links between distant points have simply not been available at any cost.
- The second point is that even if broadband communications links of equivalent quality were available between distant points over terrestrial links, the cost advantages of using satellites would be substantial. This is particularly true as the number of computers to be tied together increases, since using the satellite eliminates the need for establishing a separate link between each pair of computers which may need to communicate.
- A final factor which must be considered is the flexibility inherent in satellite communications, which makes it possible to share this vast communications capability among

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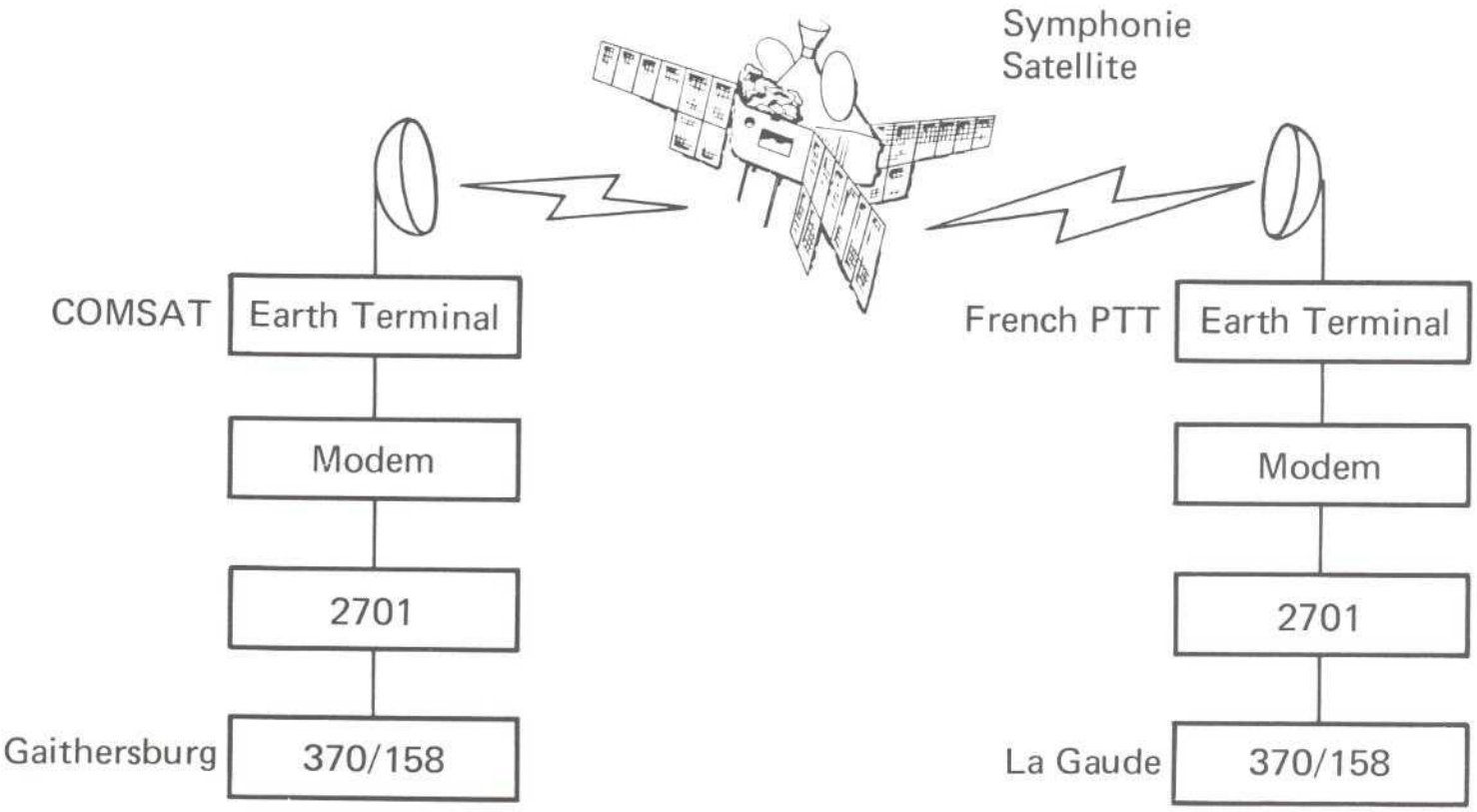
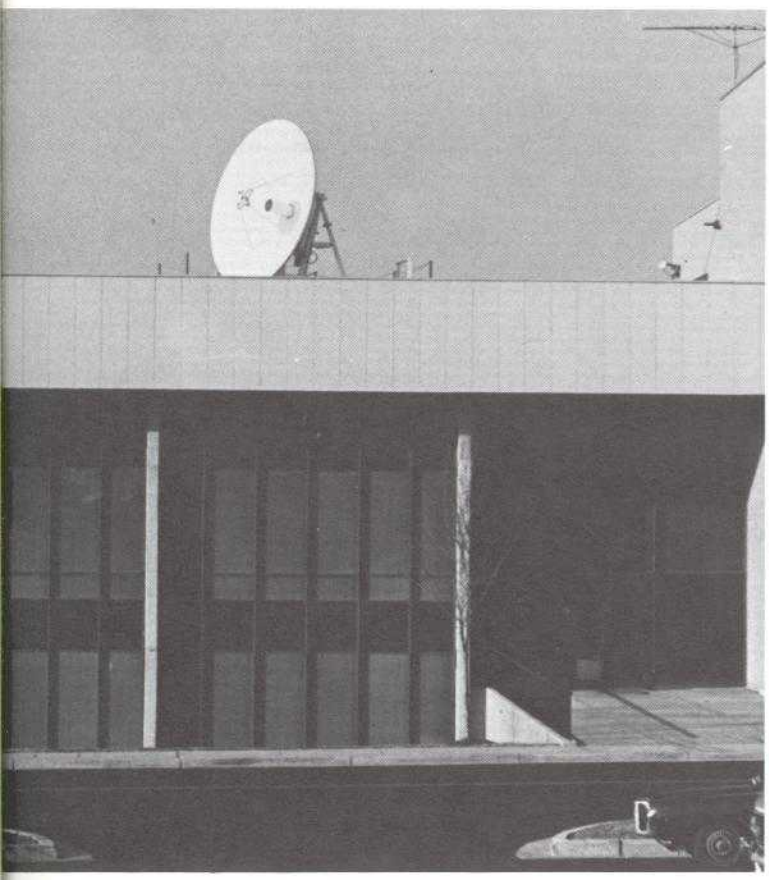

Symphonie
Satellite
COMSAT
Earth Terminal
Modem
2701
Gaithersburg
370/158
French PTT
Earth Terminal
Modem
2701
La Gaude
370/158



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many users (either simultaneously or on a time-shared basis) and thereby distribute the costs according to actual usage.

The implications of these facts are that it may now be economically feasible to consider establishing geographically dispersed networks of large computers, communicating with each other at speeds approaching those at which the computers themselves work. This would make possible the near-instantaneous availability of large banks of information at any place where the information may be needed. Obvious applications exist in the areas of earth resources data collection, banking applications (*e.g.* credit card services, check clearing, fund transfers), electronic mail, communications in multinational corporations and organizations, data processing services, and information retrieval and archival services.

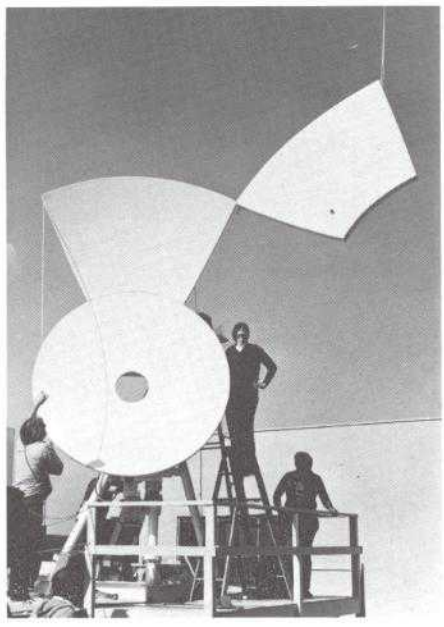
Communications Protocols

The practical difficulties involved in transmitting computer data at high rates over large distances are due in large measure to the stringent controls that must be implemented to ensure that all data which are transmitted actually reach the destination, that no errors are introduced in the data, and that the rate at which the data arrive does not exceed the rate at which it can be processed at the destination. These controls take the form of so-called link control "protocols." A simple form of protocol is often used in telephone conversations for the same purposes. For example, the phrase, "I didn't hear what you just said," indicates that the transmitted message was not received correctly. Similar phrases are used to indicate correct reception of a message (*e.g.* "I understand.") as well as to ensure that the speaker keeps pace with the listener's ability to absorb what is being said.

The chief difference in computer-to-computer communications is that the protocols are more precisely defined and are consistently applied to ensure that all messages are received correctly and that the rate of transmission is accurately controlled. Numerous types of protocols may be implemented, all of them performing essentially the same functions. The primary difference between them, when applied to high-speed communications over a satellite link, is in the "efficiency" with which data can be transmitted. Consider the fact that a message sent from Computer A to the satellite and back to Computer B travels a distance of about 45,000 miles which, at the speed of light, takes approximately a quarter of a second. Assuming the message is received correctly, Computer B will then transmit to Computer A an acknowledgement which will not arrive until nearly half a second after the message was originally sent. Clearly, if the protocol is designed such that Computer A cannot send another message until the previous message is acknowledged, the achievable data transmission rates will be very low.

To circumvent this problem, special protocols are required for high-speed satellite communications which permit messages to be quite long (perhaps several thousands or tens of thousands of bits) and which allow many such messages to be transmitted before receipt of the first one is acknowledged. Many variations are possible. For example, if Computer B receives a message incorrectly, Computer A may be requested to retransmit all data beginning with the message in error, or else to retransmit only that message and then resume where it left off.

Erecting the terminal . . .



In any case, provisions must be made for storing at Computer A the data which has been previously transmitted in case it is not correctly received and must be retransmitted. For this reason, the effectiveness of any particular protocol is judged not only by the rate of data transmission which is attainable through the satellite link but also by the cost in terms of computer resources (memory space as well as computing power) needed to support the link.

In terms of computing power, when a link of this sort is operating in a large-scale computer, it will tend to monopolize the processor; hence, the computer may spend a good deal of its time merely supporting the link. In addition, memory requirements may exceed several million bits, which may represent a large fraction of the available core memory (typically ten to twenty million bits). Costs could be reduced by connecting a small, inexpensive computer to the large-scale one. The sole function of this small computer would be to service the satellite link, thus freeing the larger computer to perform other functions.

The objectives of the experiment are to demonstrate the feasibility of using satellites for communications between distant computers, to investigate the impact of protocol design alternatives on the achievable data transmission rate, and to determine the impact of the link on computer resource requirements.

System Implementation

Several problems were encountered and dealt with in the very early stages of the experiment. A set of transmission frequencies had to be mutually agreed to by the participants which would not interfere with existing terrestrial microwave systems in the United States and France or with existing satellite systems, specifically the INTELSAT system.

The problem of establishing voice communications between the computer sites and the satellite control center was resolved by installing a voice circuit (or "order wire") through the satellite, allowing operators at each site to talk to one another prior to and during actual data transmission tests. Coordination with the Symphonie Control Center is handled by a telephone circuit between the LaGaude Site and Symphonie.

In computer communications at megabit rates, the relative speeds of each component in the system must be carefully matched to achieve the expected performance. Delays caused by the processing of instructions within the computer, or even the length of the lines connecting the computer to the communications equipment, can be very critical when operating at these high data rates.

No modification to the IBM 370/158 computers was required in order to allow them to access the satellite link. However, a small computer (2701 Terminal Control Unit) was needed at each site to interface between the 370 and the communications link.

The protocols (or procedures) were implemented by means of computer programs operating in each computer, and as such are entirely automatic. These programs are quite large by themselves, and, in addition, require large "buffer" storage areas. These buffers are used to hold all the data which was sent in the previous one-half second (the round-trip delay time through the satellite) so that it will be available in case it needs to be re-sent. At the receiving end, another large buffer is required to store the

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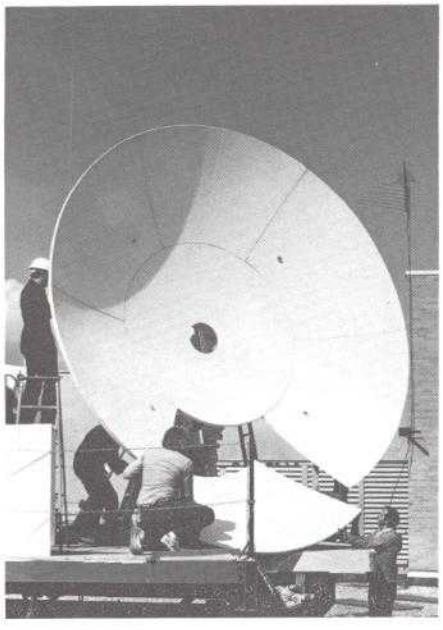
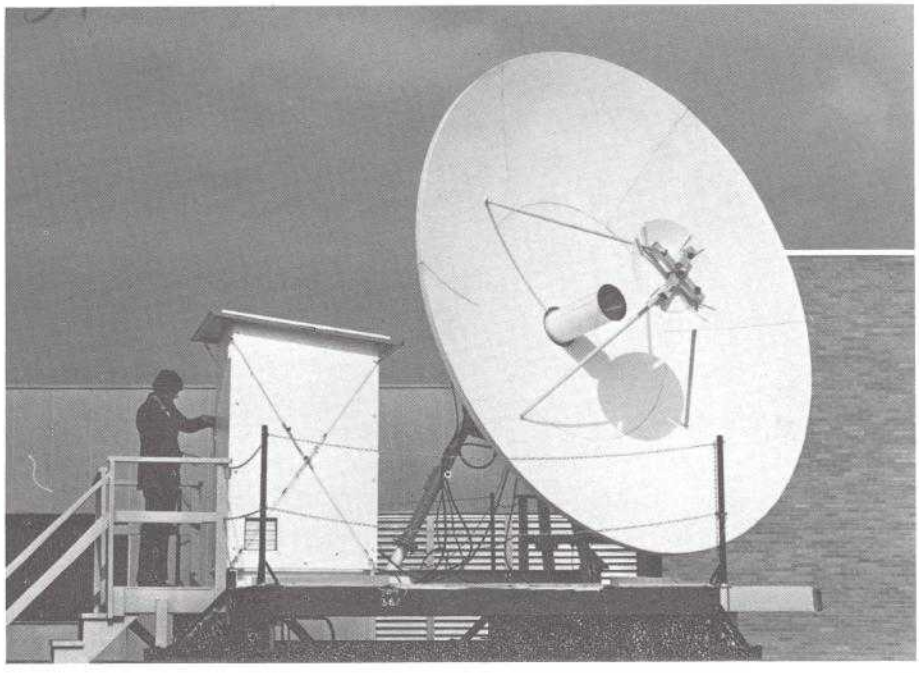
atop the IBM Building





COMPUTER EXPERIMENT

(Continued from Page 5)

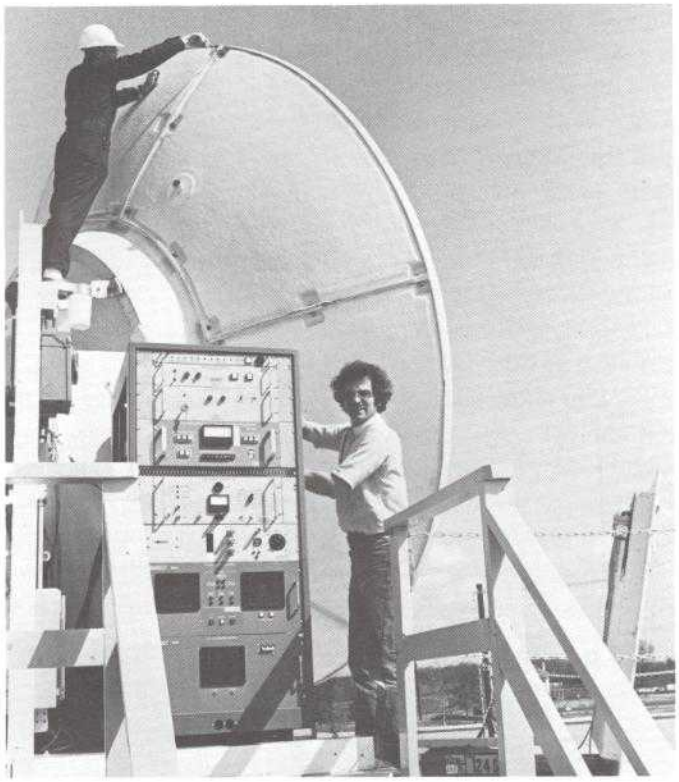
data as it is received and to put the messages back in the proper sequence if they have gotten out of order.

While the protocols operate completely automatically and without the intervention (or even awareness) of the operator, an important objective of the experiment is to find out just how well the whole process works. To do this, the computer programs automatically keep track of how much data was transmitted, how many errors were encountered in the received data, and how much data was "lost" (for example, data transmitted due to errors, etc.). This information is collected each time data is transmitted over the link and stored on a tape, which is subsequently processed by another computer program (a "data reduction" program) which prints a summary of link performance during that period.

The most important information derived from this process is the link "throughput" (*i.e.* how much data can be sent over the link per second) which, due to the necessity to retransmit data which is received in error, will always be less than the nominal channel capacity of 1.5 million bits per second.

By this means it is possible to determine how changes in the protocols affect throughput. The values which are changed include the size of each block of data (or "message"), the number of blocks which can be outstanding at any one time, the manner in which requests for retransmission are sent, etc. The performance of the link also strongly depends on how "clean" (or how free of noise) the communications path is.

The 15-foot terminal on the roof of the IBM Building was installed by COMSAT Labs. The up/down converter, high power amplifier (400-watt TWT), feed system and antenna mount were designed by the Labs. The earth terminal consists of the 15-foot parabolic dish antenna and a small shelter housing the HPA, up/down converter and low noise receiver, and a control console in the computer room 300 feet away containing the antenna and transmitter controls and the modems. The installation of the terminal was accomplished in one day by the Small Terminals Project at the Labs under the direction of J. Kaiser (Terminal Project manager), J. Steinhorn (system engineer), Fred Seidel and Dave Lehmann.



The high-powered amplifier, low-noise receiver and control equipment provided by COMSAT Labs being assembled on the roof of the IBM Building by Kim Kaiser (top of antenna) and Jeff Steinhorn of the Labs.

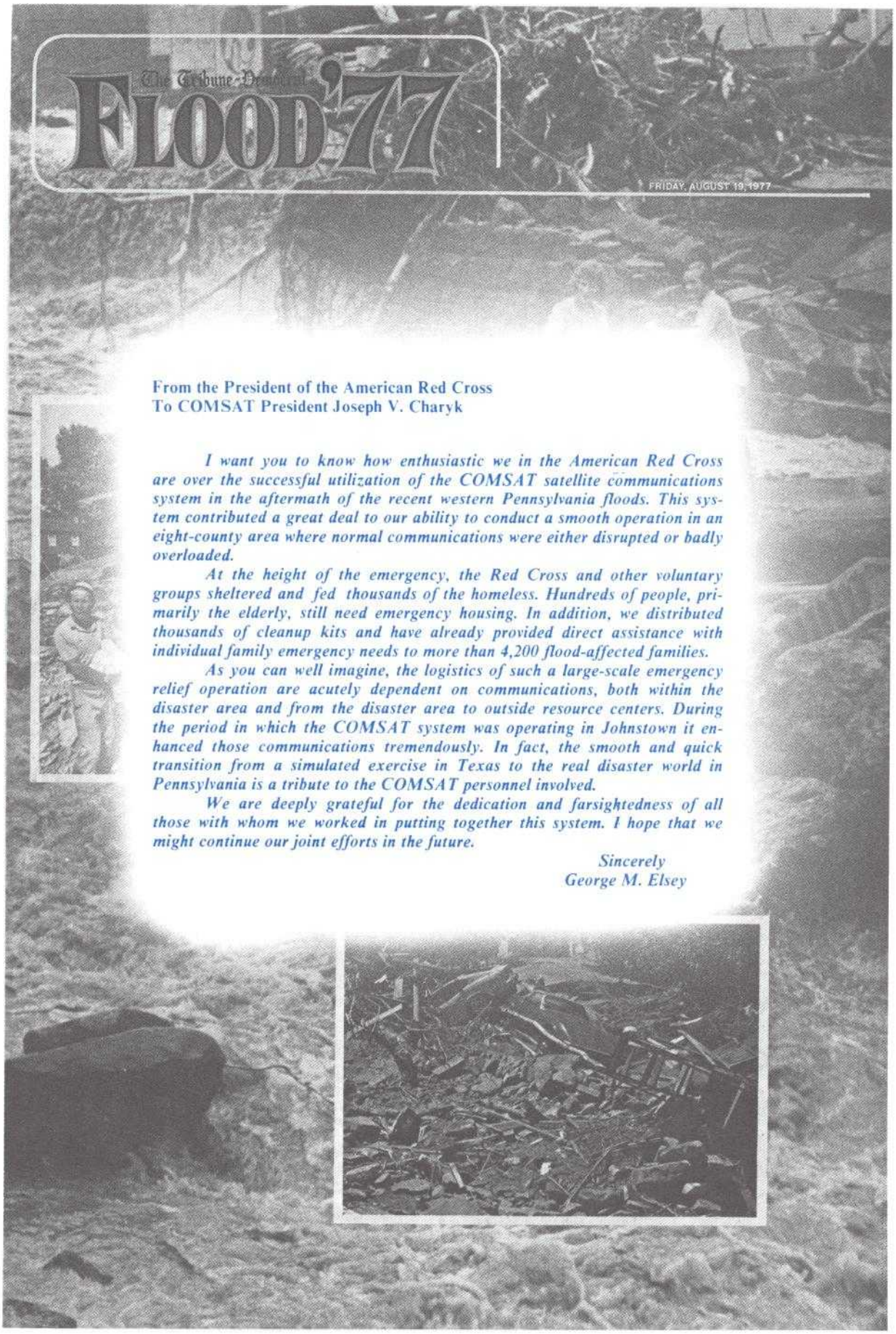
The 1.5 mbps modems (devices which take an incoming stream of bits and convert it to a form capable of being transmitted over a satellite link) furnished by IBM were modified by the Communications Processing Lab, under the direction of C. Wolejsza and John Snyder, to include forward error correction coding (a technique whereby errors introduced in the data during transmission may be detected and corrected prior to arrival at the destination). One modified modem and a complete narrowband FM order wire system were furnished to the French for use in the LaGaude terminal.

The Gaithersburg terminal, owned and licensed to COMSAT, is operated by licensed technicians James H. Buzzelli, Robert F. Hefele, Gilmore House, and Ronald R. Johnson.

Future Plans

At the present time, plans are being considered to expand the scope of the experiment to include an additional earth station at COMSAT Labs, which would allow the IBM 360/65 computer at the Labs to communicate with the other two computers. This experimental three-node network would make possible an evaluation of efficient high-data-rate transmission for point-to-multipoint (or networking) applications.

These experiments are important proving grounds for eventual applications of satellite communications to high-speed computer data transfer on a commercial basis. ●



From the President of the American Red Cross
To COMSAT President Joseph V. Charyk

I want you to know how enthusiastic we in the American Red Cross are over the successful utilization of the COMSAT satellite communications system in the aftermath of the recent western Pennsylvania floods. This system contributed a great deal to our ability to conduct a smooth operation in an eight-county area where normal communications were either disrupted or badly overloaded.

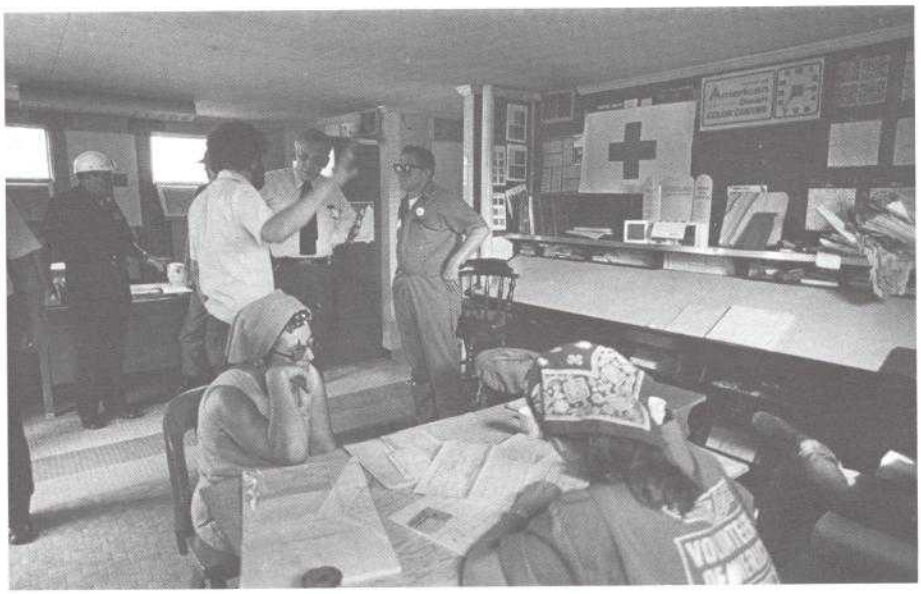
At the height of the emergency, the Red Cross and other voluntary groups sheltered and fed thousands of the homeless. Hundreds of people, primarily the elderly, still need emergency housing. In addition, we distributed thousands of cleanup kits and have already provided direct assistance with individual family emergency needs to more than 4,200 flood-affected families.

As you can well imagine, the logistics of such a large-scale emergency relief operation are acutely dependent on communications, both within the disaster area and from the disaster area to outside resource centers. During the period in which the COMSAT system was operating in Johnstown it enhanced those communications tremendously. In fact, the smooth and quick transition from a simulated exercise in Texas to the real disaster world in Pennsylvania is a tribute to the COMSAT personnel involved.

We are deeply grateful for the dedication and farsightedness of all those with whom we worked in putting together this system. I hope that we might continue our joint efforts in the future.

Sincerely
George M. Elsey

Satellite Fills Gap at Johnstown



The Red Cross Operations Center in Johnstown.

BY ROY S. POPKIN

Clara Barton would have been amazed!

When the disaster relief pioneer marshalled her forces and supplies and moved into stricken Johnstown, Pennsylvania, after the tragic flood of May 31, 1889, her only way of communicating with the outside world was through military telegraph, courier, or whatever was left in that part of the state.

If she had come back to Johnstown in July of 1977, seventy-eight years later, Miss Barton's communications to Red Cross headquarters outside the flood area would have been faster and, to the turn-of-the-century mind somewhat incredible, for, thanks to COMSAT, Red Cross emergency messages were being transmitted from the ground to a satellite high in the sky and then back to earth again.

What happened in Johnstown served to underscore the portability, flexibility and emergency utility of the new portable small-dish transmitters with which the American Red Cross Disaster Services and COMSAT have been experimenting. Moreover, what happened in Johnstown turned another "dry run" over a thousand miles away into a dramatic communications effort in the heart of the devastated flood areas of Western Pennsylvania.

This story begins in two places at the same time—the hurricane-prone Gulf Coast of Texas and the rolling hills and industrial valleys of Pennsylvania.

While Red Cross and COMSAT personnel were setting up the third in a series of experimental tests of the portable units in Texas, heavy rains turned into torrential rains over eight counties in Pennsylvania.

The Texas experiment, on July 23, involved using a transmitter with a four-foot dish in Houston and another with an eight-foot dish in Corpus Christi in a simulated hurricane-caused communications blackout. Red Cross personnel in Houston and Corpus Christi were relaying "emergency messages" and other information via telephone, teleprinter and facsimile to Red Cross Hurricane Watch headquarters in Austin, the state capital. Civil defense, public safety and other officials joined the Red Cross and COMSAT experiment there.

But even as they were sending their simulated emergency messages, word came from beleaguered Johnstown that the severe floods which killed over 73 people, injured or sickened 2,696 and destroyed or damaged more than 7,300 private homes, mobile homes and apartment units and spread devastation into stores and factories over parts of an eight-county area had also created all kinds of communications problems in and around Johnstown.

As the Texas test was being concluded on Saturday, July 23, the needs for the satellite transmitters in Johnstown were relayed to Red Cross and COMSAT people from Red Cross National Headquarters. COMSAT quickly obtained permission from NASA and the Canadian government for use of CTS satellite time for the real disaster. On Saturday evening the transmitters were on their way to the Pittsburgh airport and on Sunday they were in place outside the Red Cross disaster headquarters at the Vocation-Technical School in Johnstown.

During the next forty-eight hours, until communications improved sufficiently in the Johnstown area, Red Cross disaster personnel used the COMSAT units to communicate with division headquarters in Pittsburgh, with the national field office in Alexandria, Virginia, and the Red Cross national headquarters in Washington, as well as within the disaster area where the satellite system was tied into what amateur radio and telephone communications were then available.

(Continued on Page 14)

Mr. Popkin is Assistant National Director, Disaster Services, The American National Red Cross.

"Early Monday morning the Royal Plate Glass plant in Johnstown blew up causing the nearby telephone exchange to be evacuated. For several hours after that our satellite link was the only means of communication into and out of Johnstown."

COMSAT's Kim Kaiser makes final adjustments on terminal in Johnstown.

BY J. KAISER

A recent issue of PATHWAYS featured two articles on the activities of the Red Cross disaster aid, one a survey of past Red Cross disaster assistance, and one on an exercise in disaster relief communications via CTS (Communications Technology Satellite).

On June 23, 1977, COMSAT Labs and the Red Cross held another test, a hurricane disaster communications exercise, in Houston and Corpus Christi, Texas. It was a test destined to terminate in reality.

There was nothing unusual about the operation at the beginning. Together with Fred Seidel and Lester Veenstra we packed our 1.2- and 2.4-meter antennas, and with our small boat trailer and a van and driver furnished by the Red Cross, we headed for Texas. Jeffrey Steinhorn and David Lehman manned the 4.7-meter antenna on the roof of the Labs to complete the hookup. We set up two voice-grade channels, one each between Houston and Austin, and Corpus Christi and Austin with the latter serving as disaster relief Headquarters. These channels, together with a three-way order-wire, went via the Labs terminal into the dialed-up network to Austin.

The exercise went well. We sent voice, teletype and facsimile messages, and the Red Cross disaster teams in the three cities learned a lot about message-handling and communications discipline. We, on the other hand, again got a pretty good appreciation of the type of communications needed in a disaster situation, an appreciation which would serve us well before the "simulation" was to end.

On Saturday afternoon, as we were about to complete our exercise, we received an urgent call from M. R. Fink, Red Cross Chief of Emergency Communications, requesting that we take our 1.2-meter terminal to Johnstown, Pennsylvania—flood waters were inundating this city of more than 40,000 people and they had a real, live disaster on their hands.

With the assistance of the local Red Cross personnel, I hurriedly packed the equipment and took it to the Houston Airport for shipment to Pittsburgh. The airlines would not take the antenna unwrapped, however, so we returned to the Red Cross building and commandeered some cardboard and bandages. We then wrapped the 1.2-meter reflector to look something like a wounded turtle, which satisfied the air cargo people and those at the terminal, and on Sunday morning off we went via American Airlines to Pittsburgh.

In the meantime, we had made numerous telephone calls to arrange for the use of the CTS spacecraft, which normally alternates usage between the U.S. and Canada. With a great deal of patience and diplomacy, the NASA Project Managers were able to preempt the Canadian Monday time, and the U.S. Tuesday time.

On Sunday at dawn, Neil Helm picked up the COMSAT van and the emergency generator at the Labs and headed for Pittsburgh where we retrieved the terminal from air cargo. Not knowing the proper route, we entered the north end of Johnstown, and had to traverse the entire ravaged area. Then and there we learned that information and communications can quickly disintegrate in a disaster—we could not find the Red Cross disaster headquarters! After hours of searching, and with the help of some radio amateur operators, we

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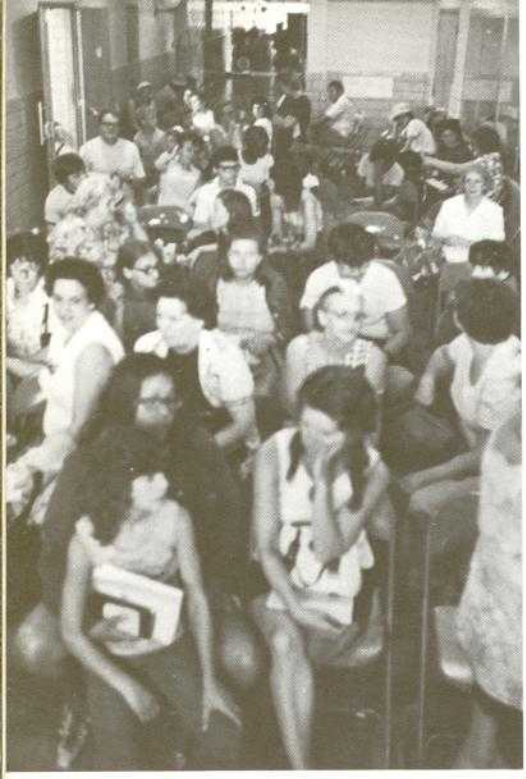
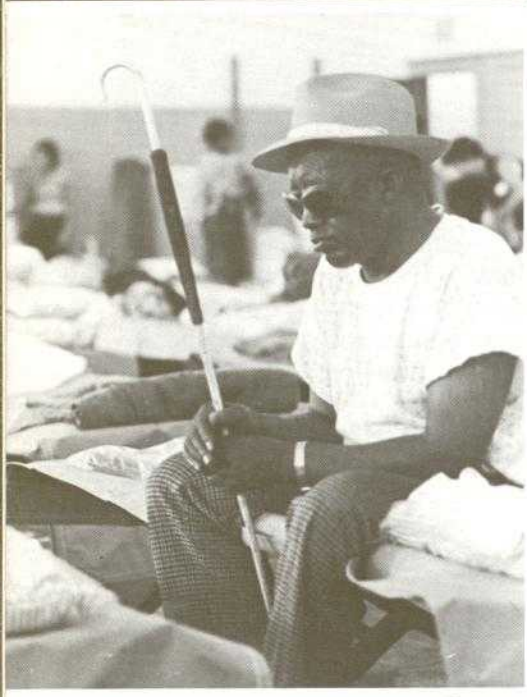
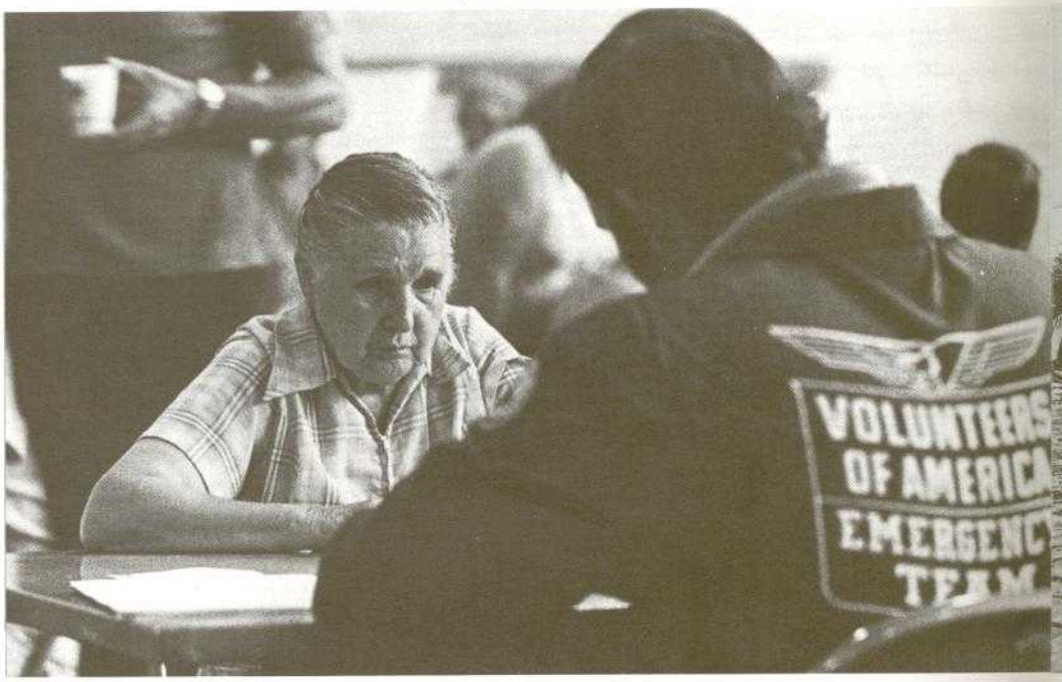
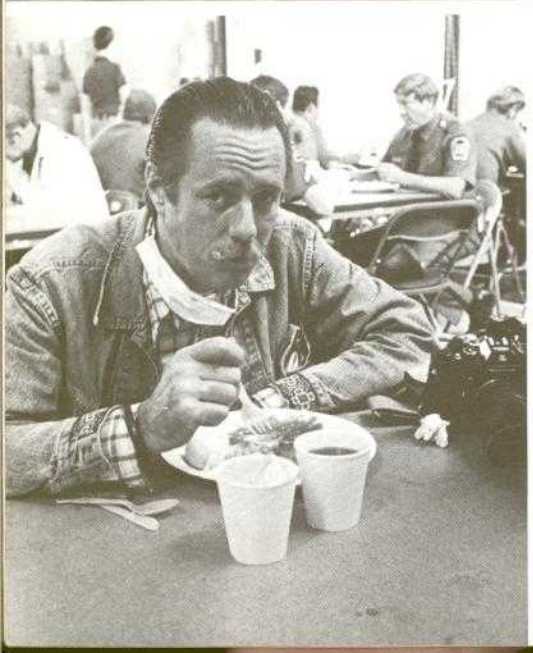
Mr. Kaiser is Manager, Small Terminal Projects, COMSAT Laboratories, Clarksburg, Md.



The faces of Johnstown



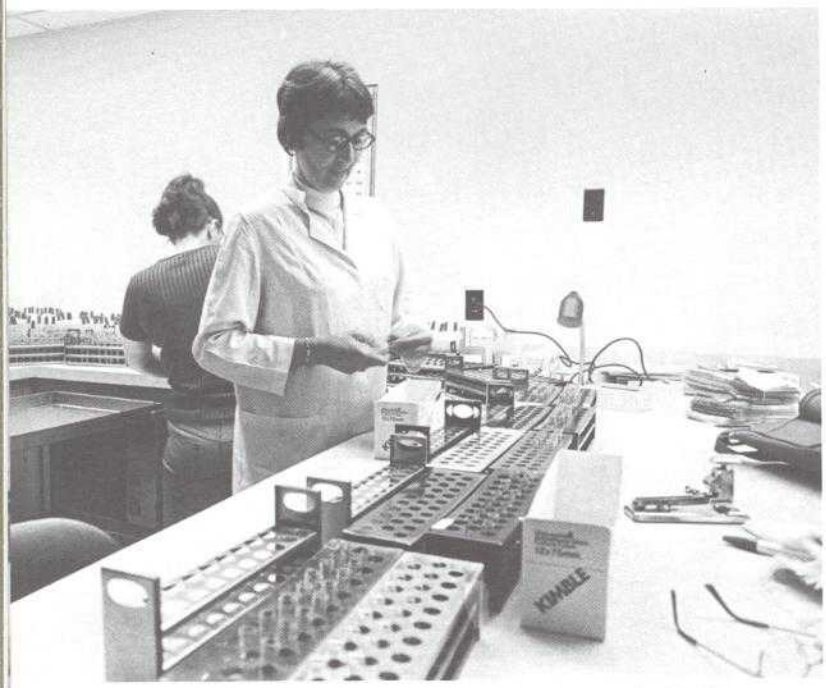




Photos courtesy of American Red Cross

Havoc in Johnstown

Services for those in need



LABS ANTENNA

(Continued from Page 9)

finally located it. After another search we found ARC's "Bud" Fink and were briefed on the situation. Returning to disaster relief headquarters we set up the terminal, and around 2:30 a.m., finally managed a few hours rest.

Unfortunately, the flood had knocked out the water plant serving the entire area, and there was no drinking water anywhere. But Fink, an "old hand" in such situations, had sequestered several cans of beer, which were put to use for such things as brushing our teeth. On Tuesday, I used "Red Cross Canned Water", which I must report is inferior to beer for this purpose!

On Monday and Tuesday we set up two telephones at the relief headquarters, connected them to the Labs terminal via CTS and thence into the dialed-up network. Early Monday morning the Royal Plate Glass Plant in Johnstown blew up, causing the nearby telephone exchange to be evacuated. For several hours after that, our satellite link was the only means of communication into and out of Johnstown. Another downpour on Monday threatened to take out our communications also, but we overcame the fading at our 14-GHz frequency by switching our signal to the 200-watt transponder in the CTS spacecraft.

The satellite link was used by the Red Cross disaster team to accomplish many communications tasks that could not otherwise have been attempted. A supply officer ordered 5,000 shovels for cleanup work from a factory in West Virginia. The head nurse arranged for a team of nurses from the Midwest to come to Johnstown, and arranged their transportation from Pittsburgh as well, not easily accomplished, as we had learned first-hand. Marked-up situation maps were sent to the National Red Cross Headquarters, and important instructions for volunteers were relayed via Telecopier. The link was also used for press releases and for inquiries about flood victims. There were hundreds of calls made during our stay. David Lehman and Jeff Steinhorn dutifully helped man the Labs station, connecting calls for everyone (Jeff never mentioned that his parents lived in Johnstown). We left the stricken city Tuesday night when it became certain that the telephone service was sufficiently restored to carry the load.

In restrospect, we discovered that, since most of the calls are outgoing, two telephone circuits can handle most of the long distance traffic that a relief team can generate. We observed how an efficient, experienced and well-prepared Red Cross relief team can effectively handle a disaster situation, and swiftly assist the victims to return to some semblance of normal life.

We were told by the Red Cross that our services at Johnstown had helped materially in the relief effort. We now know that we can respond in very short order to a real emergency, and that a satellite such as CTS can serve a very useful function in providing disaster communications. We also know that cooperation between the U.S. and Canada in regard to use of CTS is excellent, and can even be achieved on a weekend! We believe that the COMSAT/Red Cross-CTS experiment #6 has been a viable and useful demonstration of disaster relief communications via satellite.

NEW YORK TIMES, July 20—The Great Johnstown Flood of May 31, 1889, when a dam crumbled across the south fork of the Conemaugh River and a wall of water crashed onto the city, killing 2,300 people. And then there was another flood in 1936. After that, the Army Corps of Engineers spent $7 million or so on flood control work between 1938 and 1941, when that amount would build a lot of dams and flood gates.

But seven inches of rain fell last night, swelling the Conemaugh, and by early morning there was still another Johnstown Flood.

CTR at his elbow

Philip M. Morse, world renowned physicist-author, poses for Physics Today Magazine with a copy of the COMSAT Technical Review at hand. Physics Today says about Morse, "He helped (during his tenure) to transform the MIT Physics Department from a mere appendage to the Engineering School into its present state, holding premier rank in both research and education."

New station to expand Marisat service

An agreement signed by COMSAT General Corporation has opened the way for the start of construction this year of a shore station in Japan to operate with the Indian Ocean MARISAT satellite.

The station, expected to be completed in the summer of 1978, will be the first MARISAT station to be constructed outside of the United States and the first to operate at commercial frequencies with the Indian Ocean satellite.

It will extend MARISAT services to ships and offshore facilities throughout the entire Indian Ocean for the first time, significantly expanding the MARISAT System to provide full coverage over the three major oceans of the world. Other MARISAT satellites presently serve the Atlantic and Pacific Ocean areas.

Under terms of an agreement between Kokusai Denshin Denwa Co., Ltd. (KDD) of Japan, and COMSAT GENERAL, Manager of the MARISAT System, KDD will use capacity in the Indian Ocean satellite to provide modern telephone, telex and other public communications to maritime interests.

KDD will build a shore station at Yamaguchi. The start of commercial service through this new station and the Indian Ocean satellite next year will close a gap in coverage of the MARISAT System between the Straits of Malacca and the Persian Gulf.

The Atlantic and Pacific MARISAT satellites have been providing high-quality telex, telephone, facsimile and data communications at commercial frequencies to ships and offshore facilities at sea in those ocean areas for the past year.

The number of ships and offshore rigs now equipped with terminals for operation with MARISAT totals about 65. Of this total, 53 are equipped with COMSAT GENERAL mobile terminals, and 27 additional terminals have been ordered for installation in the near future.

Patent Incentive Awards

J. A. Jankowski, COMSAT Staff Engineer, receives a Patent Incentive Award for a Digital Voice Switch. Making the presentation is W. B. Carroll (left) Assistant General Manager, U.S. Communications Systems, International Operations Division.

RED CROSS

(Continued from Page 8)

Transmissions ranged from a supply officer's urgent request for thousands of shovels needed by Pennsylvanians so they could dig the mud and rubble from what was left of their homes to transmission of maps of the affected area to guide administrative headquarters personnel in determining the need for additional Red Cross staff.

At one point, when an explosion in a glass factory, caused by escaping gas, forced the evacuation of the Johnstown telephone exchange, and limited overloaded long distance service was further hampered, Red Cross was able to maintain its communications entirely through COMSAT, with messages going from Red Cross headquarters in Johnstown via satellite to COMSAT headquarters in Clarksburg, Maryland, and then by regular telephone circuits to their ultimate destination.

The Red Cross has completed its over-$2,000,000 relief operations in Western Pennsylvania and this third Johnstown flood has gone into the Red Cross history books. But a new word has been added to the disaster lexicon—*satellite communications.*

It's a word Clara Barton never knew, but she would have liked it, for it would have made her job—the Red Cross job—a lot easier if it had been part of her relief effort in 1889.

China accession brings INTELSAT membership to 98

The People's Republic of China has acceded to the Agreement of the International Telecommunications Satellite Organization (INTELSAT) bringing the Organization's membership to 98 countries. The INTELSAT Operating Agreement was signed by the Peking Administration of Long Distance Telecommunications. China became the 28th Asian/Australasian nation to join INTELSAT.

The most populous country in the world, and one of the most extensive geographically, China has been utilizing the INTELSAT system since 1972 and now has three earth stations—two near Peking and one near Shanghai. China is currently operating 23 full-time satellite circuits on the INTELSAT system as well as using television capacity on an as-needed basis.

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.

Brazilian antenna system undergoes testing

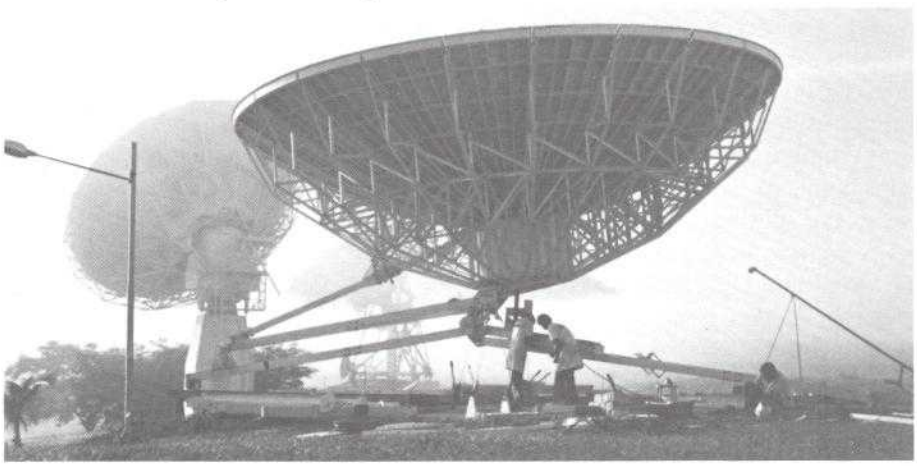
The first Brazilian antenna system for satellite communications is now undergoing testing at Embratel's Earth Station in Tanguá near Rio de Janeiro.

The antenna is 10 meters in diameter with Cassegrain feed design for high efficiency performance. Some of the features in antenna design include: "locked in" surface tolerance allowing guaranteed antenna performance without field panel alignment; panels and trusses fully interchangeable without panel realignment permitting quick repair in the event of damage; reflector panels, backing structures and hub made of aluminum to minimize surface distortions due to differential thermal expansions; and low noise amplifier mounted inside the antenna hub.

Additional design features include: galvanized steel mount (elevation-over-azimuth type), continuous elevation range from zero to 90 degrees and a 100-degree azimuth range covered by two overlapping 50-degree sectors; manual and electrical drives for positioning in each axis; and field erectability, utilizing the antenna drive system without need for a crane or any special device.

The antenna system has been designed, developed and manufactured by AVIBRAS-INDUSTRIA AEROESPACIAL of São Paulo. Established in 1961 as a private company in Aeronautics Engineering, AVIBRAS has been a pioneer in the aerospace field in Brazil.

Brazilian antenna system at Tangua.



Schwartz announces staff assignments

Stephen D. Smoke has been appointed Deputy Director of Public Information in addition to his responsibilities as Manager of Publications. He joined COMSAT in 1966 as Senior Information Officer in charge of Public Presentations and served in that capacity until 1975 when he was placed in charge of corporate publications.

COMSAT's corporate publications include required reports such as the regular reports to shareholders and the report to the President and the Congress; regular publications including PATHWAYS and COMSAT Technical Review; technical and marketing publications and publications to meet other corporate needs.

Previously, Mr. Smoke had been in charge of public relations services provided by Hill & Knowlton, Inc. to American Iron and Steel Institute and coordinated steel industry public relations activities during national wage negotiations between 1949 and 1956. As Senior Vice President of Gaynor & Ducas, Inc. he had important public relations responsibilities during the developmental stages of the U.S. aerospace reconnaisance and intercontinental ballistics missile programs. As the head of his own organization, formed in 1960, he was consultant to American Metal Climax, Inc. during the early years of its formation as the largest industrial merger since U.S. Steel Corporation was put together.

Mr. Smoke was among the first members of the Public Relations Society of America to be accredited and is a charter member of the PRSA Counselors Section. He is a graduate of Lehigh University and has taken public and industrial relations courses at a number of universities.

Judith S. Elnicki has been designated Manager of Media Relations and Information Services by Robert B. Schwartz, Secretary and Director of Public Information, replacing Lawrence Weekley who transferred recently to SBS.

Mrs. Elnicki will be responsible for COMSAT's relations with the news media including the issuance of press releases, handling press inquiries and the scheduling and coordinating of interviews with the media.

In the area of Information Services Mrs. Elnicki will oversee the dissemination of internal information and coordinate the release of information with interested subsidiaries, affiliates and other organizations, and be responsible for Corporate advertising.

Mrs. Elnicki will supervise the Special Events program including exhibits, demonstrations, visual productions, photographic services, tours, special information-oriented programs and will assist in Shareholder Meeting arrangements.

Mrs. Elnicki holds a bachelor's degree in Business Administration from American University. She joined COMSAT in 1968 and has worked principally with shareholder and administrative matters and, most recently, was Manager of Shareholder Relations.

Nancy E. Weber has joined the Office of the Corporate Secretary as Assistant for Board and Shareholder Matters, replacing Judith S. Elnicki who has moved to a new position in the Office of Public Information.

In her new position Mrs. Weber will be responsible for matters relating to meetings of the COMSAT Board of Directors and its committees, including the preparation of agendas, reports and other materials provided the Board, and minutes of meetings.

In the area of Shareholder Matters she is responsible for the Corporation's Shareholder Relations Program including matters relating to communications with shareholders, contacts with shareholders and supervision of banks which provide stock-transfer and shareholder-record-keeping services to the Corporation.

In addition to the foregoing, she will also assume responsibility for certain tasks related to the Annual Meeting of Shareholders.

Mrs. Weber holds a bachelor's degree in International Relations from the University of Minnesota. Joining COMSAT in 1970, she has worked principally with INTELSAT matters and, most recently, was Manager for INTELSAT Affairs and Documentation in the INTELSAT Management Division.

Notes From Personnel

One of the principal features of the Thrift and Savings Plan permits a "periodic partial distribution"; that is, a withdrawal without penalty, while you are still employed. During November, participants who were in the Plan during 1974 may elect to receive, during February 1978, a distribution of the value of their contributions as well as of the Corporation's contributions for the year 1974, both valued as of December 31, 1977. If this option is not exercised, the value of the contributions listed above will remain in the Plan until: (1) retirement; (2) termination of employment; or (3) a withdrawal via the standard withdrawal options described in section 9 of the Plan.

To assist you in making your decision whether or not to exercise this option, a statement setting forth the value of your 1974 accounts as of September 30, 1977, together with the amount of your 1974 contributions will be provided. Also, the statement will contain additional information regarding your Thrift and Savings account as of September 30, 1977.

Should you decide not to exercise this option during November for the value of the total 1974 contributions, the Trustee will continue these investments in the fund(s) you have elected. It is important to note, however, that the 1974 Corporate contributions become fully vested on December 31, 1977.

The periodic partial distribution election is made during November each year for the value of all contributions made during the fourth preceding year. If that election is not made those values remain invested in the appropriate fund(s) and in the future may only be withdrawn via the standard withdrawal options.

If you choose to exercise this option, you must obtain a Disbursement Form, CSC 845, from the Personnel Services Unit at the Plaza, the Personnel Office at the Labs, or from the Administrator at your location. The completed form must be returned to the Personnel Office at the Plaza by November 25, 1977.

National Urban League conference

COMSAT was among the approximately 150 exhibitors participating in the 67th National Urban League Conference held recently in Washington. COMSAT has been a participant in these conferences since 1963 as part of its policy to keep the community acquainted with its Equal Opportunity Employment Program. In the above photo, Yvonne Dupree of COMSAT's Personnel Office gives a poster to a young attendee at the Conference.

COMSAT-sponsored JA companies successful

In May 1977, 55 Junior Achievement (JA) companies in the Metropolitan Washington area ceased operation and liquidated their assets. Approximately five percent of the companies that started the program year in October 1976 went bankrupt. The remainder of the companies completed the program year and about half were able to return to their stockholders an amount equal to or greater than the initial investment.

Although Starlite Enterprises and United Productions (the COMSAT-sponsored JA companies) were financially successful and returned both an operating and liquidating dividend to their stockholders, all companies participating in the Junior Achievement Program were educationally successful. Students were taught the fundamentals of the American free enterprise system and were able to learn by actually experiencing the responsibilities of operating their own mini-company. Some students experienced success, some experienced failure and some a combination of both—but whatever the experience, students left JA with a better understanding of the economic and business principles of the free enterprise system.

In the new program year, COMSAT will again sponsor two JA companies which will be counselled by June Burton of the Treasurer's Office, Cynthia Clarke of Corporate Affairs, Aaron Goldsmith of U.S. INTELSAT, Richard Keefer of Accounting, Patricia Kiernan of INTELSAT Management, Sherry Wells of Accounting, and Melvin Williams of Personnel.

Network Bits

Field Correspondents

Andover
Joanne Witas

Brewster
Dorothy Buckingham

Cayey
John Gonzalez

Etam
Bev Conner

Fucino
Sandy Tull

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 station CEA held its annual picnic at Black Mountain. The weather was in the 90s but the shade of the pine trees served to cool things off. **Dan Grenier** and wife **Carol** toured the Rocky Mountains, Yellowstone National Park, Lake Tahoe, San Francisco, the Northern California coast to Crater Lake, Oregon, then on to Seattle, Jasper National Park, and Alberta, Canada, returning to the States and Andover via Glacier National Park, Montana.

Ralph Summerton and family toured the Midwest spending time in Albuquerque, Salt Lake City and visiting with his brother in Ohio. **Sven Engblom** and family toured the East Coast spending most of their time at Rehoboth Beach, Delaware. They also spent time at the Smithsonian and visited relatives in Pennsylvania. **Herman Sauret** is back at work after spending a month in his new home in Florida.

The Visitor's Center has now closed for the season. Tour guides on duty had another busy summer greeting some 11,000 tourists. The new film, *VOICES,* was a big success. **Al Gerace** is on temporary loan to the TTC&M Station at Tangua Earth Station in Brazil. **Chuck Lepage** is back at Andover after spending a month at COMSAT Headquarters. **Barbara Richardson** recently married **Freeman Hayden.** **—Joanne Witas**

CAYEY. Since the Cayey Employees Association elected new officers, two highly successful activities have taken place, a beach party and a cook-out (photos below). The beach party was held at Humacao Beach on the Island's east coast.

The cook-out was held at Paul McGranahan's five acres. Both activities were highly successful and enjoyed by large numbers of the membership. The CEA also purchased the rented softdrink machine from the rental company and it now provides the main source of Association revenues. **—John Gonzalez**

ETAM. We just have to pass along what we feel is a most unusual "deer tale." **Dave Cross** had finished his evening shift and was driving home after midnight when he came across an acquaintance standing alongside his car in the middle of the road. Stopping to offer help (Dave assumed his acquaintance was having car trouble), he learned that the car had struck a deer which was now lying alongside the road. Because of the lateness of the hour, the man suggested that instead of calling and waiting for the game warden they put the deer in the car trunk and take it to the warden.

Dave obliged and the cars headed for the home of the game warden when again the other car came to a halt in the road. Lo and behold, thumping, kicking and snorting sounds could be heard coming from the "dead" deer inside the trunk. The man stood to one side armed with a club as Dave cautiously opened the trunk lid. Everything went so fast then that Dave could only remember seeing the club descend, hearing a thump, and the brief glimpse of an irritated deer charging out of the trunk, knocking aside his friend to go charging up a hill and disappear into the nearby woods. We hold this to be about the best deer tale we've ever heard.

Ron Feather, formerly of Oakland, Maryland, has completed building his new home in Kingwood. **Marvin Miller** recently moved onto his 70-acre "spread" outside of Kingwood. **Dave Cross** is building a new home in Parsons.

Changes have been made in security and janitorial services; Mrs.

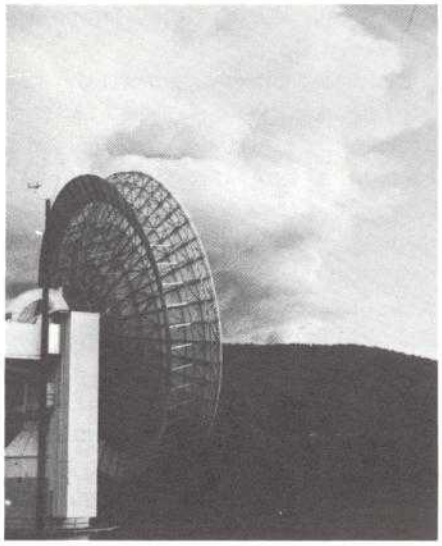
Phyllis Loughrie, formerly in janitorial services, is now a guard, and her previous position filled by Mrs. **Chris Sigley** of Etam. **Jimmie Lansberry** left his guard position and **Harold Knotts,** a guard at Etam for nine years, has retired.

Vacations have been numerous: **Mike Britner** and family vacationed in Florida and Hershey Park, Pennsylvania; **Spencer Everly** and family at Myrtle Beach, South Carolina; **John Formella** and family in Canada; **Paul Helfgott** and family in Champion, Pennsylvania; **Rupe Hobbs** went sailing on his 23-foot sailboat at Mt. Storm Lake, West Virginia; **Bill Mayes** and family and **Sam St. Clair** and family at Cedar Point on Lake Erie; **Mike O'Hara** and his wife in Maine; **Roger Parsons** and wife in King of Prussia, Pennsylvania; **Lynn Rector** and wife at Sea World in Aurora, Ohio; and lastly, the **Conners** took a trip out west.

Bill Bell is departing for California. **Don Gaston** said he didn't have to go anywhere since he lives in the "Garden of Etam." **Roger Parsons** spent two weeks in Washington working for the station. **Betty Ball** and **Ron Feather** were off for short periods for medical reasons.

The annual CEA picnic was held at Rowlesburg Park with cooperative weather, games and good food. With the arrival of Fall thoughts turned to the Buckwheat Festival held in Kingwood in early October. It was followed by the Forest Festival in Elkins.

—Bev Conner



JAMESBURG. The Marble-Cone forest fire moved within sight of our station, approximately three miles by line-of-sight to be exact, as seen in the accompanying photos, before being brought under control in late August. The fire got its name from the two locations, Marble Peak and Ventana Cone, where the fires were reportedly ignited when lightning struck early in the month.

The total area covered by the fire exceeded 175,000 acres and damage was estimated in excess of $85 million. It is considered the second largest forest fire in the history of the Los Padres National Forest.

The Jamesburg Station is well protected against forest fire damage because of the grazed areas adjoining the station and the adequacy of fire fighting equipment on hand.

—C. B. Marshall

LABS. The "Woman of the Year" award was presented to **Cris Inman** by the Gaithersburg Chapter of the Business and Professional Women's Association. Congratulations to **Bill** and **Carol Van Der Weele** on the birth of their new son **William Matthew,** born in August. **Pam** and **Casey Wood** are "treading the boards" in *Sound of Music* presented by the Westminster Community. **Shirley Taylor** directed *Life With Father* in the Readings Theatre presentation at Martinsburg's Anthony House Restaurant.

A weekend fishing excursion to Indian River, Delaware, was reported a success by Spacecraft Labs fishermen **John Rosso, Phil McRorie** and **Blaine Shatzer.** The fourth member of the party, **Ray Curtis,** claimed to have caught a nice string of flounder but failed to produce the evidence.

Bill Allen attended a short course at the University of Michigan. **Dr. Brij Agrawal** has rejoined Spacecraft Labs in the Stabilization and Structures Department after spending two years in the Aerosat SPO. **Bill Kreutel, Al Ramos** and **Brij Agrawal** recently traveled to Bangalore, India, under a COMSAT GENERAL support contract to the Indian Space Council. **George Huson,** Project Manager of the Labs Telespazio contract, attended the successful launch of the SIRIO Satellite with **Dr. Bargellini. Dave Kreutzer** and **John Lyons,** two VPI co-ops, recently completed assignments in the Spacecraft Lab and returned to school.

The Labs softball team sponsored two softball tournaments at our field at the end of August. Gallotti's Italian Village Restaurant won first place. In early September the tournament was won by the Independents of Virginia. A one-pitch tournament was scheduled for late September.

Recent transfers include **Ruth (Marie) Allnut** to the Plaza, **Bob Kreutel** to the Assistant Director of Technology, **James Proctor** to the Chemical Processing Lab and **Jorge Manrique** to the Signal Processing Lab. Among the vacationers were **Judy, Ernie** and **Charlie Martin** to Miami for a week, and **Bob** and **Pam Dahlgren** spent a week in Bermuda. **Charlotte Gant** and **Richard Scott** have announced their engagement.

New faces at the Labs include INTELSAT Nominees **H. Nishi,** Applied Science Lab, and **B. Arroyo,** Transfer System Lab; and new employees **Charles Stanton, David Rogers, Thomas Votaw, Marvin Stanton, Margaret Lindsey, John Duke** and **Aubrey Grantham.**

Receiving Patent Incentive Awards recently were **R. Arndt, A. Atia, A. Berman, H. Carlson, R. Cooperman, J. Dunlop, P. Fleming, A. Meulenberg, M. Onufry, S. Rhodes, A. Standing, J. Su, H. Suyderhoud, G. Van Ommering, M. Wachs** and **A. Williams.** Safety Awards were presented to **A. Ewing, H. Mueller** and **K. Stuart.**

Ten-year Service Awards were presented to **J. Campanella, N. Helm, G. Huson, B. Merrihew, C. Pentlicki, C. Wolejsza, J. Dunlop,** and **J. Su.** Receiving five-year Servive Awards were **S. Beall, J. B. Bell, C. Devieux, V. Hott, M. McGaha** and **G. Meadows.** —**B.P.S.**

PAUMALU. Senior Technician **Bill Osborn** has turned into a very successful home gardener. Since moving into their new home a year and a half ago just a mile away from the station, Bill and his family have had home-grown vegetables—tomatoes, peppers, broccoli, brussels sprouts, cabbage, strawberries, and herbs, among the more successful items harvested. Bill is very proud of his large bell peppers; also, the tomatoes which average one to one-and-a-half pounds, with the largest tipping the scale at two pounds.

Bill's current pet project is to have an herb garden planted along his driveway and walks. His comments regarding gardening in Hawaii as compared to what he remembers in Iowa—"There are tremendous differences in soil and climatic conditions, also, there are many more insects and bugs to contend with in Hawaii." Bill's success in home gardening, he feels, has been the proper preparation of the soil, adding sand, mulch and compost, and "...going around with a fly swatter and butterfly net." He has experienced something which he says most farmers probably don't realize—that many of the plants like the peppers keep producing all year long due to the Hawaiian climate with no freezing winters.

Don Stribling, Senior Technician, started jogging in earnest when he realized he was putting on weight and beginning to feel listless. Six months and several hundred miles later, Don has brought his weight down to a trim 155 pounds from an overweight 220. As a technician assigned to work on rotating schedules, Don has had a problem in maintaining a regular jogging schedule. He has worked out a three-shift schedule which calls for jogging eight miles every other day. Since trimming 65 pounds in six months, he has had to respond to many questions from his fellow employees and friends, obviously envious of his accomplishment, as to how he did it. The biggest problem Don has faced, however, has been replacing his clothing.

Senior Technician **Leslie Goya** is currently on temporary assignment as a member of the COMSAT Labs Support Team to the CTS Program. He left Hawaii on September 8 to join three other members of the team for training at the Labs. Senior Technician **Leonard Nagashima** has been transferred from his Fixed Station Operations duties to TTC&M Operations during the temporary absence of Goya.

Paumalu employees recently had an opportunity to conduct a controlled fire exercise under the guidance of a Fire Inspector from the City and County of Honolulu. The training in the proper use of fire extinguishers was held in conjunction with the required hydrostatic testing and refilling of all extinguishers on station. Pictured bottom left are the Paumalu fire fighters in action.

—**Bob Kumasaka**

SOUTHBURY. Congratulations to Communications Technician **Mike** and **Mona Masse** on the birth of their son, **Mike, Jr.,** who weighed in at seven pounds and fifteen ounces. **Rose Marie Eureka** and **Dolores Raneri,** MARISAT Operators, were re-

cently guests of "Radio Bob" Ritch, on board the *Lash Atlantico*, while docked in New York. The MARISAT Operators also recently received a gift of Spanish honey and beeswax soap from the vacationing Captain Parker of the Prudential Lines, in appreciation of their assistance throughout his duty at sea.

Roger Miner, TT&C Technician, and **Cindy Bachyrycz**, MARISAT Operator, took vacations to Florida which included visits to Disney World and viewing the launch of the VOYAGER II at Cape Kennedy. On September 1, approximately 15 Radio Officers from U.S. flag merchant vessels representing the American Radio Association visited the site for an in-depth tour conducted by Station Manager **Coburn**. They were accompanied by **J. Jenvey** of the Technology Institute for Maritime Electronics. —**Eileen Jacobsen**

Worth Noting

John B. Gantt has been elected General Counsel and Secretary of COMSAT GENERAL. Joining COMSAT in 1973, Mr. Gantt became Acting General Counsel of COMSAT GENERAL in 1976.

J. Levatich has been designated Assistant for Technical Coordination, reporting to the Vice President, Systems Engineering and Development. He will serve as the COMSAT GENERAL focal point for technical aspects of the SBS venture.

Ernest B. Kelly, III, has joined the COMSAT Congressional and Government Relations staff. He most recently served as Legislative Assistant to Senator Ted Stevens of Alaska.

At Presstime

COMSAT responds to FCC escrow query

COMSAT responded on September 30 to the FCC's earlier inquiry with respect to the escrow accounts maintained by COMSAT, assuring the FCC that the accounts are in all respects consistent with the FCC's accounting order providing for an escrow of funds pending the outcome of judicial review of the FCC's 1975 rate decision with respect to global system services.

In its letter to the FCC, COMSAT noted that the FCC's order required COMSAT to file "informational" tariffs showing rates that would be in effect under terms of the rate decision, to maintain accurate records of all transactions covered by the rate decision, and to deposit in escrow the difference between the informational tariff rates and rates in effect at the time of the FCC's rate decision.

COMSAT informed the FCC that informational tariffs had been filed after conferring with the FCC's staff, that the required records have been maintained, and that COMSAT "has faithfully deposited" in escrow the difference between the revenues collected and those it would collect under the informational tariffs. "Until its letter of September 9, 1977, the Commission has never suggested that COMSAT has failed in any way to comply with the requirements" of the FCC's order, COMSAT said. "And as should be apparent . . . , there is no basis for any such suggestion since the escrow accounts established and maintained by COMSAT are in all respects consistent with the Commission's accounting Order."

Angola joins INTELSAT

The People's Republic of Angola has acceded to the INTELSAT Agreement bringing the Organization's membership to 99. The INTELSAT Agreement was signed by the Empresa Pública de Telecomunicacoes (EPTEL). Angola becomes the twenty-fifth African nation to join INTELSAT.

Launch attempt ends abruptly

The attempted launch of the INTELSAT IV-A (F-6) for service in the Indian Ocean Region was terminated 55 seconds after liftoff the evening of September 29 when the Atlas stage of the Atlas-Centaur launch vehicle exploded. The November 10 launch of another IV-A has been cancelled and will be rescheduled following the identification and correction of the recent launch vehicle problem.

We deliver.

The helping hand of United Way delivers medical treatment and psychiatric attention and child care and family counseling and sports equipment and craft programs.

More than 100 agencies of The United Way of the National Capital Area and The United Black Fund deliver all these and much more to people who need them.

Love and patience and understanding and caring and skills and hope and courage and confidence.

United Way agency people deliver all these, wherever they're needed to replace despair and desperation.

Tangible things that can be seen and touched or intangibles that can be sensed; everything we deliver costs money.

Of course you sympathize. But if you believe deep down that there's no such thing as a spare life, you sympathize and give your fair share to The United Way.

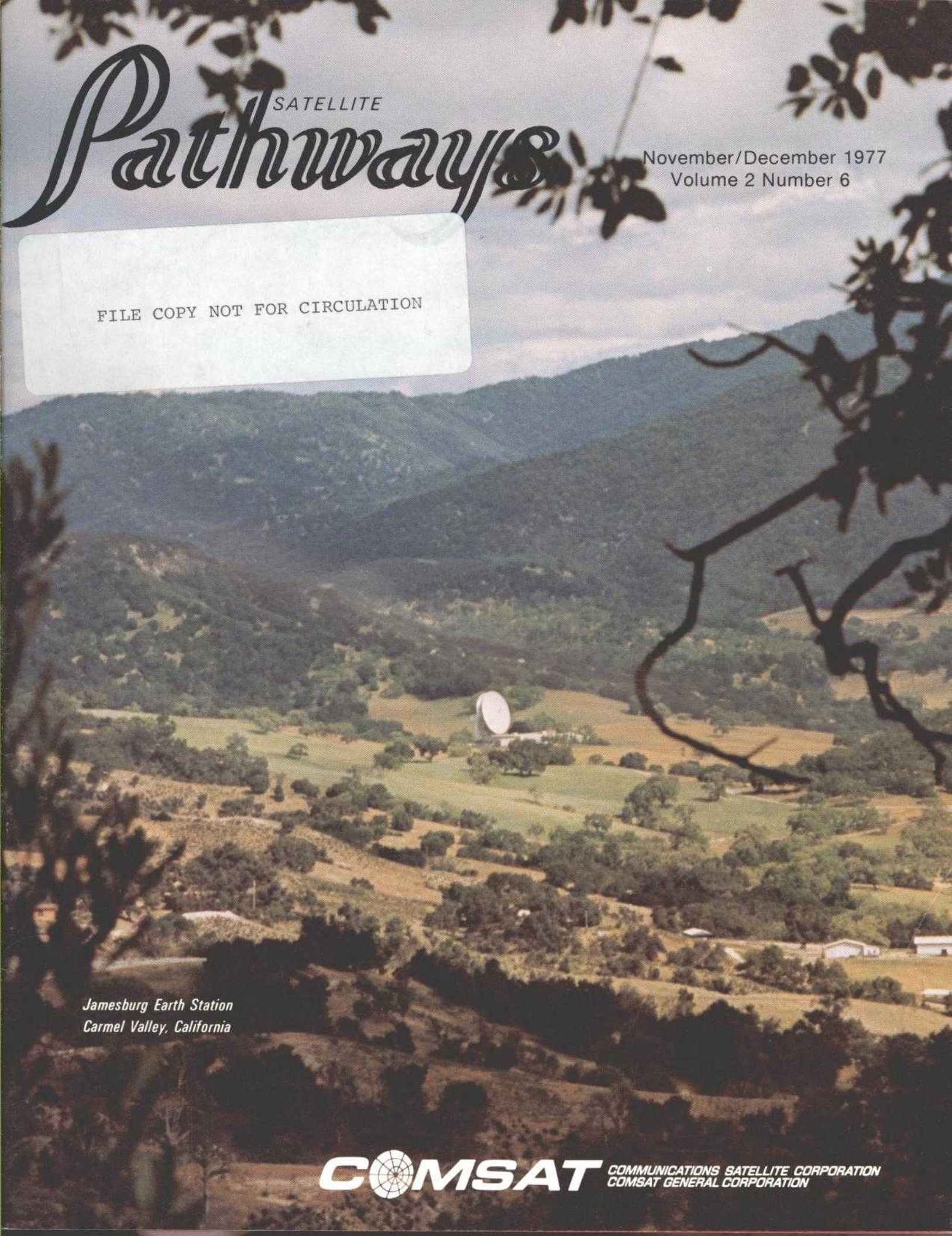
You certainly can help us make a lot more deliveries next year.

Thanks to you, it works for all of us.

COMSAT
COMMUNICATIONS SATELLITE CORPORATION
COMSAT GENERAL CORPORATION
WASHINGTON, D.C.

SATELLITE Pathways

November/December 1977
Volume 2 Number 6



Jamesburg Earth Station
Carmel Valley, California

COMSAT COMMUNICATIONS SATELLITE CORPORATION
COMSAT GENERAL CORPORATION

SATELLITE Pathways

November-December
Volume 2 Number 6

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and Best Wishes for a
Joyous New Year to
Members of the
Communications Satellite
Corporation
and their Families:

Jamesburg Earth Station, Monterey County, California.

Jamesburg: a bridge between worlds

STORY AND PHOTOGRAPHY
BY JOHN J. PETERSON

The thunder of pounding hooves and the protesting groans of the hard-driven stagecoach racing across the valley floor alerted John James to the approach of the stage from Salinas.

Dust-covered John Lewis climbed down from the driver's seat high above the team of sweating horses and quickly turned the U.S. Mail over to James. The year was 1886 and Lewis had just brought the first mail-carrying stage into California's Carmel Valley. With the delivery of mail to the homesteaders in the Jamesburg-Cachagua region, another link had been forged in the chain of communications linking these early pioneers with the rest of the world.

The homestead and post office established by James, whose wife became its first postmistress and from whom the tiny settlement along the Cachagua Creek took its name, was the forerunner of the communications facility which today bears its name—Jamesburg.

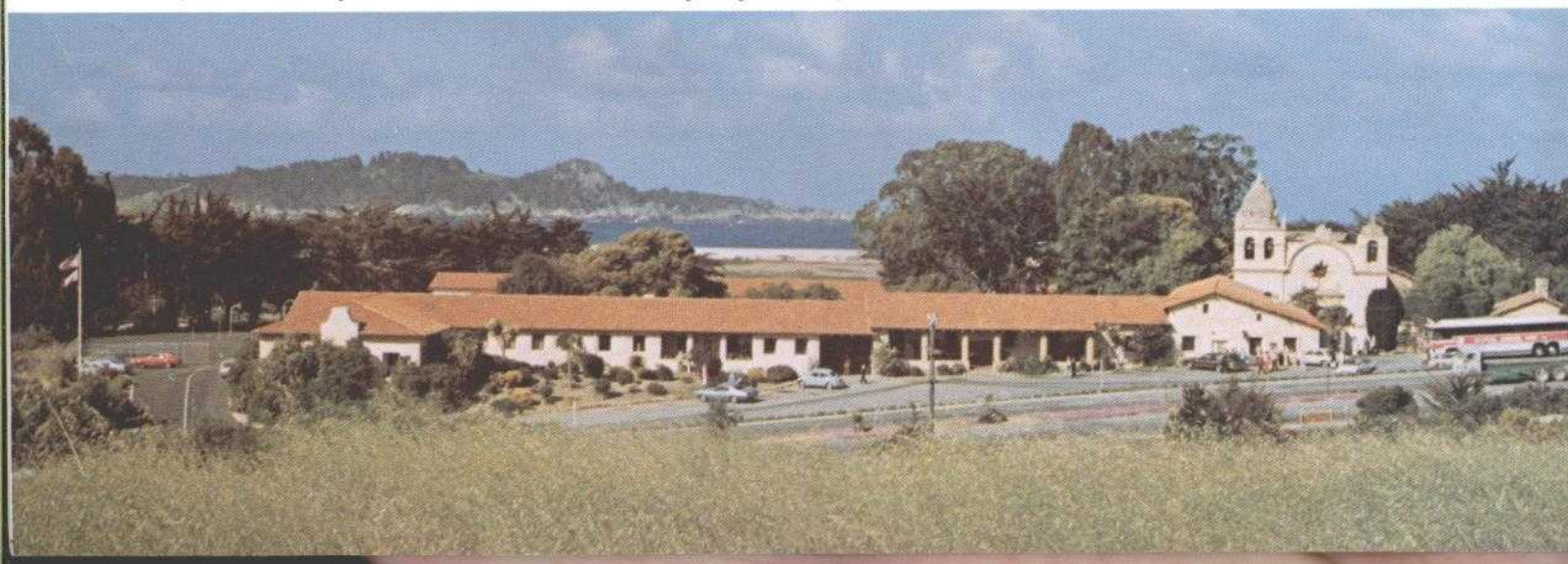
Mr. Peterson is Editor Of Pathways.

Editor's note. *Actually, the Jamesburg Station is located in the Cachagua Valley about seven miles from the old Jamesburg Post Office, long since abandoned, but shown on the U.S. Coast and Geodetic Survey Map. The station was named after the nearest identifiable map location.*

In the expansion of the North American continent westward toward the Pacific Ocean, the James family and their hardy breed of frontiersmen could be credited with bringing civilization to the fertile valleys of central California. However, the influence of other civilizations had been felt along the coast a few miles west for more than 500 years. Spanish explorers and seafarers had been probing the Monterey Peninsula for centuries and their penetrations inland had left the marks of their civilization.

On November 17, 1542, 50 years after the discovery of America, Don Juan Cabrillo, a Portuguese seaman in search of California's fabled riches, first sighted the "noble harbor" of Monterey Bay. Although high seas prevented Don Cabrillo from landing, he is credited with being the first of the Spanish explorers to anchor in "La Bahia de los Pinos" (The Bay of Pines) which he named in honor of King Phillip II of Spain.

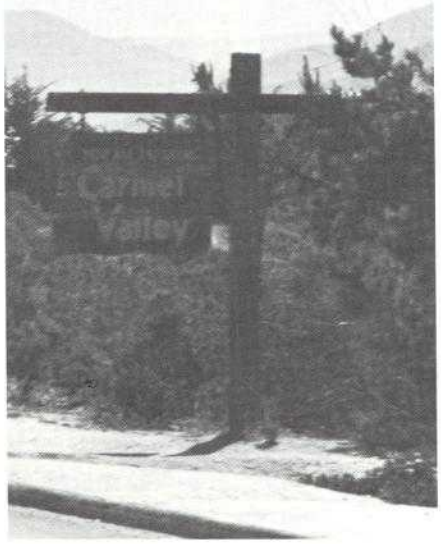
Mission San Carlos Borreomeo de Carmelo, Carmel Mission, considered by historians as the most beautiful of all Spanish Missions, was founded in 1770. Located at Carmel-by-the-Sea, it is but a 45-minute drive from the earth station.



Captain Vizcaino permitted the two Carmelite friars to name the valley beyond the hills to the south after their Order. Thus, Carmelo *has existed on the maps as early as 1602. In this valley is COMSAT's Jamesburg Station.*

In 1599, King Phillip III of Spain ordered the outer coast of California explored again on the western side of what contemporary maps called "the large and goodly Islande of California." It was the search for this harbor, to be a haven for the rich galleons of Spain in their trade with Manila, that led to the discovery of San Francisco Bay, to the establishment of missions, presidios and pueblos in northern California as outposts of empire against other land-seeking countries. The Monterey Peninsula would rise as the site of the old capital of Spanish and Mexican California, where all politics and mission business of importance would transpire, and would fall an American possession when the Gold Rush denuded it of its population and took business and politics farther north.

The King's order to explore the western side of the "Islande" went to the Viceroy of Mexico, Don Gaspar de Zuniga y Acevedo, Conde de Monterey. The Viceroy chose Sebastian Vizcaino, a successful Spanish merchant, to carry out the King's order and, on May 5, 1602, he left Acapulco with three ships, the San Diego, the Tres Reyes and the Santo Tomas. He remained at sea for nine months retracing the same coastal route as Cabrillo 60 years earlier. On December 13, Santa Lucia's Day, a coastal mountain range loomed upward on the starboard side of his flotilla. Vizcaino entered the range in the Ship's Log as La Sierra de Santa Lucia. The mountains he recorded were those that stretch from Monterey to Big Sur to the south.



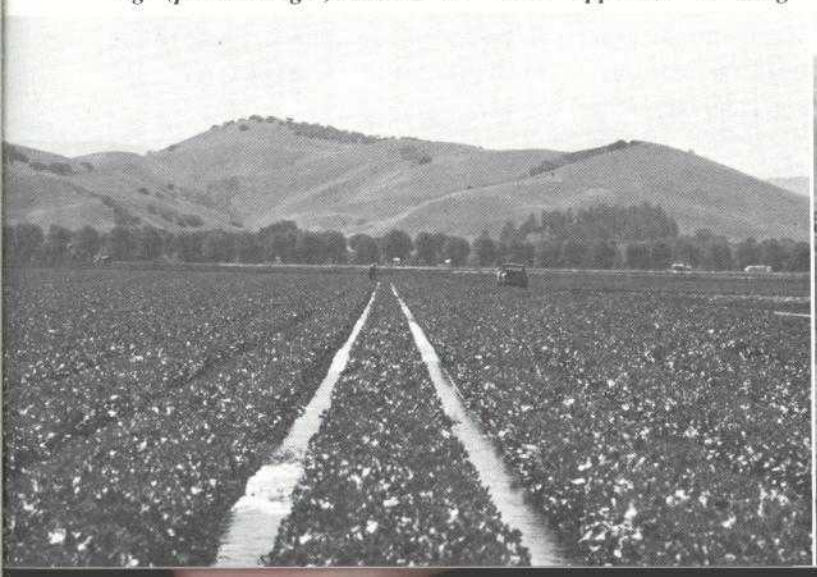
Leaving the Carmel Mission and crossing Highway 1, a sign announces the entrance to Carmel Valley and the approach road to the Jamesburg Station.

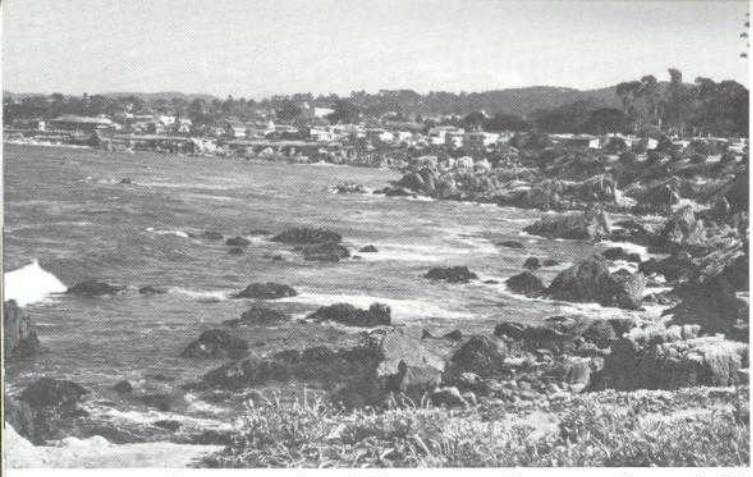
Fog slowed the flotilla briefly as it made its way gingerly along the coast. When the weather cleared on the 16th, the little squadron rounded the Point of Pines and came to anchor. Captain Vizcaino named his harbor El Puerto de Monterey, in honor of his Viceroy, and took possession of it in the name of King Phillip III of Spain under a great oak tree which still stands near the entrance to the Presidio of Monterey. Here he erected a cross at whose foot Mass was celebrated for the first time on the soil of California.

Vizcaino found the port area to be thickly populated with a people he described as of gentle disposition, peaceable and docile. Their food consisted mainly of seeds and a variety of game which they had in great abundance.

Traveling with Captain Vizcaino were two Carmelite friars and, after naming his landing place after his patron, Vizcaino permitted them to name the valley beyond the hills to the south after their order. Thus, Carmelo existed as a magical name on the maps as early as 1602.

Monterey County's Salinas Valley, known as "America's Salad Bowl," produces most of the Nation's lettuce from June through October (photo at left). Grapes for wine making (photo at right) seem to be "heirs apparent" to King Lettuce. The California Valley is also the leader in the production of broccoli, cauliflower, celery, strawberries, artichokes, processed spinach and specialty crops such as chili peppers and garlic.





Ocean View Boulevard along the Monterey and Pacific Grove coastline offers unlimited opportunities for the amateur and professional photographer alike.

For more than 160 years no Spanish ships sailed into California harbors. It seemed that California had been forgotten. Viceroy Monterey had returned to Spain and the new Viceroy showed no interest. Interest was renewed only when the Russians started using the north coast of America as a source of animal skins. The then Viceroy of Mexico feared the approach of the Russians to California. The King of Spain agreed the new land should be held. Gaspar de Portolá, Governor of Lower California, and Father Junípero Serra, President of the Lower California missions, would lead the expedition to establish California's missions.

One June 3, 1770, Fr. Serra founded the Mission San Carlos Borromeo de Carmelo at Presidio of Monterey. It was the second of the missions forming the chain of 21 eventually dotting the countryside of Alta California. The first, San Diego de Alcalá, had been built a year earlier on Presidio Hill overlooking the bay of San Diego.

Mission San Carlos, considered by historians as the most beautiful of all of the Spanish missions, is but a 45-minute drive from the Jamesburg Earth Station. It was but a year after Fr. Serra began missionary services at the Presidio that he made the decision to move the mission into the Carmel Valley where the soil and streams offered better opportunities for the mission to become self-sustaining. Guide maps today identify it as Carmel Mission.

Mission San Carlos Borromeo de Carmelo was named in honor of Saint Charles Borromeo, a Cardinal of the 16th Century. It is the seventh in a series of churches dating back to 1771 when the first crude shelter of logs was erected at Carmel. It was to become Fr. Serra's headquarters as Father-President of the chain of missions. It would also be the site for his interment when he died in 1784, worn out from the rigors of his duties and suffering from a tubercular infection as he approached the age of 71.

Monterey, as capital of Alta California, became the military and ecclesiastical seat of rule under the Spanish, and later Mexican, flags, until the American-Mexican War. In 1846, Commodore John D. Sloat sailed into Monterey Harbor and raised the American Flag over Monterey. In 1848, the Treaty of Guadalupe Hidalgo ended the war with Mexico and ceded California to the United States.

But the Carmel Mission to the west of Jamesburg, although the most historic of missions, is not the only relic of Spanish influence close to the Earth Station. A short drive to the east lies the partially restored Mission Nuestra Señora de la Soledad, thirteenth of the 21 missions founded in 1791 and named for "Our Lady of Solitude." Although named by Captain Portolá and Fr. Juan Crespí indirectly, the mission was actually named by the Indians. One of the few words the Spaniards could make out in their attempts to communicate with the Indians was "soledad" (or so it sounded to the Spaniards), the Spanish word for loneliness. The mission was aptly named as it turned out to be one of most desolate of the missions. When the rubble was cleared away to begin restoration in 1954, all that could be utilized of the original structure was the front corner of the chapel.

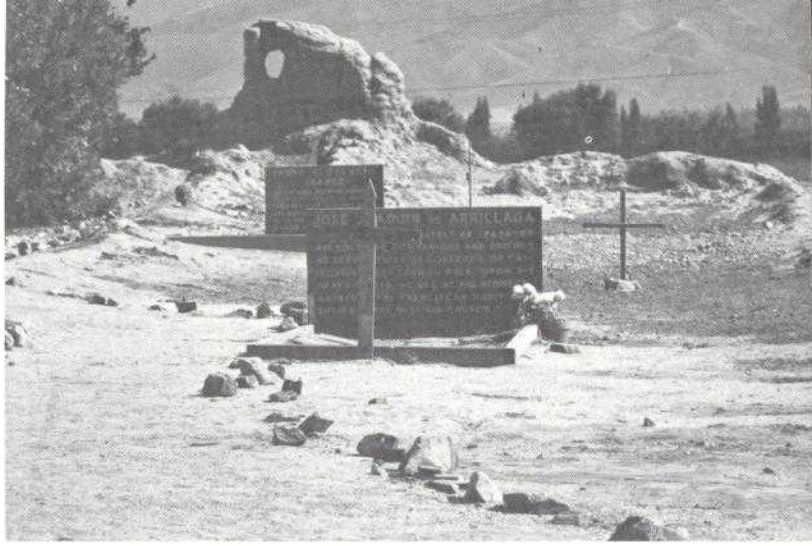
Although missions are generally thought of as being only churches, those in California were complete settlements including friary, church, shops, storage houses and dormitories. To the missions came the Indian converts who were taught to work all the tasks at the missions: tending crops or gardens, the large herds of cattle, even becoming skilled in such jobs as tanning and working leather, blacksmithing, woodwork and carpetry.

Unmarried Indian converts were locked up at night to keep them from temptation. Married couples lived in villages of huts outside the missions. Indians who broke the rules were severely punished. Those who escaped were hunted down and brought back to be harshly disciplined. Some of the missions were protected by forts called Presidios.

(Continued on page 16)

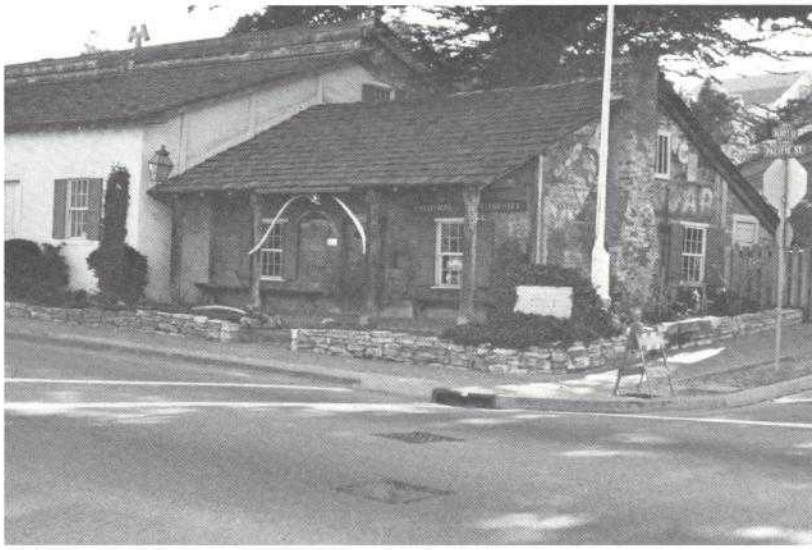
A short drive to the east of the Jamesburg Station is the partially restored Mission Nuestra Señora de la Soledad, thirteenth of the 21-mission chain, named by Captain Portolá and Padre Juan Crespi, friend and co-worker of Father Serra, for "Our Lady of Solitude" in 1791.

Salinas, the County seat of Monterey County, is the birthplace of noted author John Steinbeck. In many of his novels such as **Tortilla Flat** *and* **Cannery Row** *he used Salinas, Salinas Valley, Monterey and the Monterey Bay area as background. His birthplace is open to the public.*



Inside the original adobe walls of Soledad Mission, Jose Joaquin de Arrillaga, first Spanish Governor of Alta California, lies buried. The Governor died at Soledad while making a tour of the missions in 1814 and was buried beneath the church floor.

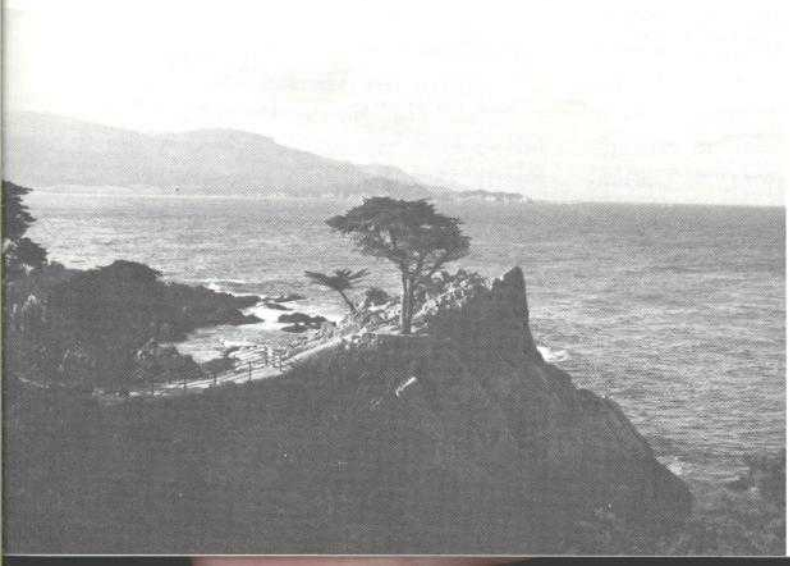
The entrance to one of Monterey's major tourist attractions, Fisherman's Wharf.



California's First Theatre built in Monterey in 1846-47 by an English sailor named Jack Swan.

Clinging to nearly bare rock is one of California's most familiar landmarks, the Lone Cypress. One of the most photographed attractions on the Peninsula's 17-Mile Drive, it is close to the world-famous Pebble Beach Golf Course.

The Army's Fort Ord is stragetically located on Monterey Bay and is the home of the 7th Infantry Division. The statue of a Drill Instructor overlooks the Fort's main entrance and Monterey Bay.



Jamesburg Station: ten years of service

BY JOHN P. SCROGGS

The COMSAT-operated Jamesburg Earth Station sits on a 170-acre tract of land in the Cachagua Valley in Monterey County's Upper Carmel Valley in California.

Construction of the Jamesburg Station was started on October 2, 1967, marking a period during which new stations at Etam, West Virginia, and Cayey, Puerto Rico, were also built along with a new antenna at Paumalu, Hawaii, to meet the new Standard Station criteria established by INTELSAT for the INTELSAT III satellites.

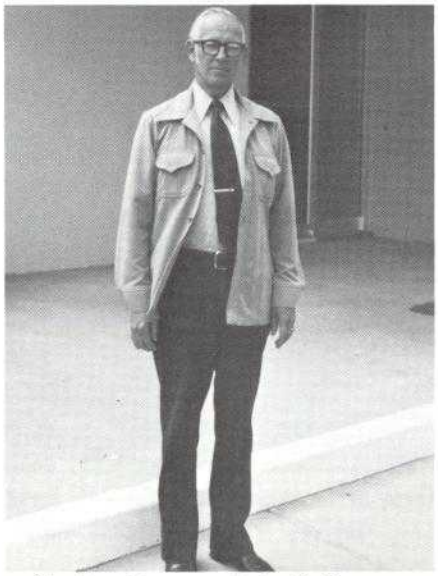
The new Jamesburg Earth Station was nearing completion in October of 1968 when it was prematurely pressed into service to transmit 1968 Olympic programs from Mexico to Ibaraki, Japan. A small transportable station had been installed by COMSAT at an AT&T/PT&T microwave relay station, Loma Prieta, south of San Francisco, to transmit the Olympic programs to Japan via ATS-1 satellite. But a strong windstorm developed at that time—so strong that the small transportable station could not keep its antenna pointed at the ATS-1 satellite. So Jamesburg was called upon and did transmit 12 Mexican Olympic programs to Japan over the ATS-1 satellite during the period October 13-27, 1968.

After this emergency service, Jamesburg's integration tests were completed and on December 1, 1968, full-time commercial service was started.

Initial services via INTELSAT II (F-4) were transferred from Brewster and included Paumalu, Hawaii; Moree and Carnarvon, Australia; Ibaraki, Japan; and NASA ships, *Mercury* and *Redstone*. A total of 191 circuits were transferred. Brewster was released from service to permit it to undergo retrofit modifications for achieving "standard station" criteria to operate with INTELSAT III satellites.

Mr. Scroggs is Manager, Jamesburg Earth Station.

On February 15, 1969, Jamesburg and all other stations in the Pacific Region transferred services from INTELSAT II (F-4) to the new INTELSAT III (F-3) satellite which had been successfully launched on February 5, 1969. To accomplish this change the antenna feed polarizer had to be changed from linear to circular polarization. This required a short interruption of service while the antenna was pointed to zenith and the polarizer hardware was changed. In eight years of operation this has been the only scheduled outage taken by Jamesburg when all services were disrupted to make equipment modifications.



Station Manager John P. Scroggs

During 1969 service was inaugurated with four new Pacific Region stations—Si Racha, Thailand, and Tanay (now Pinugay), Philippines, in March; Pulantat, Guam, in November; and Taipei, Taiwan, in December.

In April of 1969, a somewhat delayed dedication ceremony and open house was held at the station with COMSAT President Joseph V. Charyk and Congressman Burt L. Talcott of Salinas the principal speakers. It was a memorable occasion; many COMSAT officers and prominent local people were in attendance; the Carmel High School Band provided music and the dedication ribbon was cut by an explosion activated by a signal which traveled from Jamesburg to Moree, Australia, and back via the INTELSAT III (F-3) satellite, a journey of over 80,000 miles in six tenths of a second.

Jamesburg started its participation in Apollo missions with Apollo 9 in March of 1969. By far the most spectacular TV program ever handled by Jamesburg was "Man's First Walk on the Moon." This transmission came from the Apollo 11 lunar module via Parkes, Australia, National Radio Astronomy Station, then through Moree Earth Station, INTELSAT III (F-4), Jamesburg and AT&T terrestrial lines to NASA, Houston, Texas, then to the Network Pool in New York City. It came back to Jamesburg with network commentary added and was transmitted to earth stations in the Pacific Ocean Region.

When Ibaraki, Japan, received this transmission they relayed it to the Yamaguchi Earth Station, which transmitted it to Goonhilly, United Kingdom, via the Indian Ocean satellite for release to the European Broadcasting Network. This around-the-world routing was used because the Atlantic INTELSAT III satellite was out of service at that time due to a freeze-up of its mechanically despun antenna. Despite the satellite malfunction, over 600 million people watched this historic event because of the flexibility of the satellite communications system. The world watched the Apollo and Skylab splashdowns in the Pacific Ocean transmitted live via Jamesburg from a small portable earth station on board U.S. Aircraft Carriers in the Pacific Ocean.

In 1970 service was inaugurated with new earth stations Kum San, Korea, in April and Bartlett, Alaska, in July; and in June of 1971 with Warkworth, New Zealand.

In January 1972, the INTELSAT IV (F-4) satellite was successfully launch-

ed and, on February 19, 1972, Jamesburg and all other Pacific Ocean region stations pointed over to this new satellite from the INTELSAT III (F-4).

Jamesburg has pioneered in utilization of, or experimentation with, new satellite communication technology. One example was the Unmanned Geophysical Observatory (UGO) earth station built by Stanford University for the National Science Foundation, which was tested at Jamesburg; then installed at McMurdo Sound, Antarctica, where it operated very successfully for over a year (January 1972-February 1973) sending a thin stream of data via the Pacific Ocean INTELSAT III satellite and Jamesburg to a computer at Stanford University. That data stream came from many sensor inputs to the UGO containing such valuable information as meteorological, electromatic and solar activities in the Antarctic.

In December 1972, the first Single Channel Per Carrier (SCPC) service was established between Jamesburg and Paumalu. This service provided the space segment of a 50-kilobit data channel which was established between NASA's Ames Aeronautical Research Center in California and the University of Hawaii as part of the ARPA network linking computers with other computers. This initial SCPC service has grown to four 50 or 56-kb data channels in 1977.

The year 1972 was the year the Peoples Republic of China opened its doors to communications by satellite with the U.S. and, in fact, satellite communications played a big part in the visit by the President of the United States to China and the start of new U.S.-China relations. On February 4, Larry Cisneros, Operations Supervisor at Jamesburg, became the first person to talk to the Peking, China, Earth Station by satellite. The Peking station was a small portable earth station installed by a team from Hughes Aircraft Corporation. On the 25th of February the Shanghai Earth Station started operations with Jamesburg. The television coverage of the President's visit came through Peking and Shanghai's stations to Jamesburg.

In 1973 Jamesburg handled important communications for Skylab missions and covered the TV splashdowns in the Pacific Ocean. New service was established for a brief period with earth stations on Kwajalein and at Lena Point, Juneau, Alaska. Service with Bartlett Earth Station in Alaska was discontinued in December when that service was transferred to the RCA domestic satellite system. On December 16, 1973, all service to and from Hawaii was transferred to a single transponder in preparation for leased transponder service. Service with Sentosa, Singapore, was started on July 6, 1974.

In November 1974, the INTELSAT IV (F-8) was successfully launched and, on December 15, all POR earth stations pointed over to the new satellite from the INTELSAT IV (F-4). With this significant event the satellite system now had a spare INTELSAT IV in orbit and the transition in the POR to the PAC-14 frequency plan could start. Jamesburg activated its 972-channel MU carrier on December 19.

The significant events of 1975 included activation of two new SCPC circuits to Moree, Australia; testing DIGISAT equipment at Jamesburg and the use of that equipment for a demonstration in San Francisco at the Hyatt Regency Hotel; establishing communications to the USN's Vanguard in POR for the Apollo/Soyuz mission and handling TV coverage of the splashdown of the Apollo spacecraft transmitted from the *USS New Orleans*.

The significant events of 1976 included the loss of leased transponder service to Paumalu, Hawaii, with the activation of the AT&T/GT&E COMSTAR domestic satellite system and the transfer to Brewster of services to New Zealand, Peking, Thailand and Korea.

In 1977 Jamesburg again established communications with the USNS *Vanguard* in the Pacific Ocean where it provided communications for NASA's deep space satellite launches. Also, in 1977, all SCPC traffic was transferred to a new DCC SCPC terminal providing added capabilities.

Jamesburg engineers keep traffic moving smoothly to and from countries in the Pacific Ocean Region.

Jamesburg communications: meets rigid standards

The landmark of the Jamesburg station is its dish-shaped antenna which stands taller than a 10-story building. The smooth face of the large reflector was designed to critical tolerances within 50 thousandths of an inch. So sensitive is the antenna and associated receivers that initial calibration was accomplished by engineers tuning to the radio emissions from the star, Cassiopeia A, many light years away.

Communications are transmitted and received at the same time through each of the antennas at microwave

(Continued on page 16)

Station milestones: Olympics to lunar landings

July 1, 1967—John P. Scroggs assigned as Station Manager.

October 2, 1967—Broke ground for Control Building.

April 12, 1968—Began placing steel on antenna structure.

June 3, 1968—Moved into Administrative Offices.

November 26, 1968—Completed integration testing.

December 1, 1968—Commenced full-time commercial operations.

1968 Summary—Transmitted Olympic Games from Mexico City to Japan; initial operations conducted with Paumalu, Moree, Ibaraki and Carnarvon Earth Stations and NASA ships Mercury and Redstone.

February 15, 1969—Transferred traffic from INTELSAT II (F-4) to INTELSAT III (F-3).

March 4, 1969—Began operations with Si Racha, Thailand, and Tanay, Philippines.

April 25, 1969—Station dedication ceremonies.

June 2, 1969—Transferred traffic from INTELSAT III (F-3) to INTELSAT III (F-4).

November 2, 1969—Began operations with Pulantat, Guam, Earth Station.

December 18, 1969—Activated commercial traffic with Taipei, Taiwan, Earth Station.

1969 Summary—Provided communications support for Apollo missions; received investiture of Prince Charles of England as Prince of Wales; received video of first walk on the moon.

April 9, 1970—Began operations with Kum San, Korea, Earth Station.

July 1, 1970—Inaugurated operations Bartlett, Alaska, Earth Station.

1970 Summary—Continued communications support of Apollo Program.

June 15, 1971—Inaugurated service with Warkworth, New Zealand, Earth Station.

1971 Summary—Continued Apollo communications support; conducted tests with National Science Foundation's unmanned Antarctic earth station.

January 22, 1972—INTELSAT IV (F-4) successfully launched.

February 4, 1972—First contact with Peking Earth Station.

February 4, 1972—All POR stations pointed over to INTELSAT IV (F-4) from INTELSAT III (F-4).

February 25, 1972—Began operations with Shanghai Earth Station.

December 6, 1972—Inaugurated first SCPC service with Paumalu for circuit from University of Hawaii to Ames Aeronautical Laboratory, California.

November 21, 1974—INTELSAT IV (F-8) successfuly launched.

1972 Summary—Continued Apollo communications support; received commercial geophysical data from McMurdo Sound Earth Station in the Antarctic; received live TV from Peoples Republic of China of President Nixon's visit.

June 28, 1973—Began service with Kwajalein Earth Station.

August 3, 1973—Began service with Lena Point, Juneau, Alaska.

December 20, 1973—Jamesburg-Bartlett service discontinued.

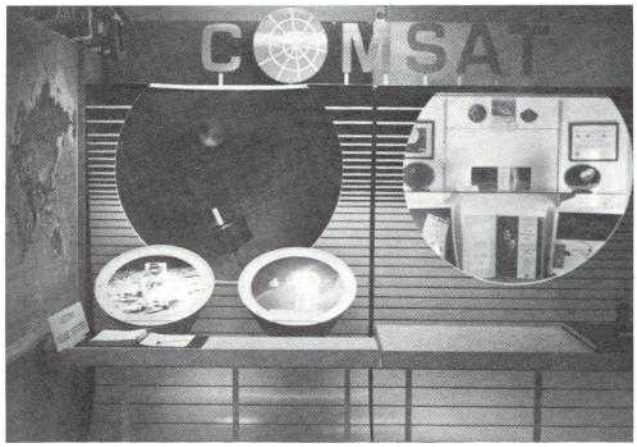
1973 Summary—Received "Silver Snoopy Award" from NASA for participation in Apollo Program; communications support of Apollo and Skylab.

July 9, 1974—Began service with Sentosa, Singapore.

December 15, 1974—All Pacific stations pointed over to INTELSAT IV (F-8).

January 7, 1975—Moree SCPC circuit activated.

March 26, 1975—INTELSAT IV (F-8) malfunctioned, all POR stations pointed over to INTELSAT IV (F-4). On April 1 all POR stations returned to F-8. On April 8 and 9, F-8 again malfunctioned for short periods. On April 18 all POR stations pointed over to F-4 to allow for SCPC check of F-8. On May 19 all POR stations pointed back to F-8.



The display area at the station records some of the highlights of the station's activities since beginning operations in 1968.

1975 Summary—Digisat demonstration between Jamesburg and San Francisco; established communications with USNS *Vanguard* for Apollo/Soyuz Mission.

July 26, 1976—Leased transponder service terminated and transferred to AT&T COMSTAR domestic system.

November 22, 1976—Installation of new SCPC terminal started.

January 21, 1977—All SCPC services transferred to new terminal.

July 28, 1977—Established communications with USNS *Vanguard* for NASA deep space satellite launches.

August 5, 1977—Installation of new DCC SCPC terminal completed and all SCPC circuits transferred to it on August 18 and 19.

Board approves solicitation for TTC&M proposals; authorizes launch of IV-A spare over Indian Ocean

The Twenty-ninth Meeting of the INTELSAT Board of Governors was held September 21-28, 1977, at INTELSAT Headquarters. Twenty-four Governors, representing 65 of the 99 Signatories, were present for all or part of the meeting. This was the first meeting presided over by Mr. José Martinez-Villarejo as Chairman and Mr. Marcel Perras as Vice-Chairman.

Among its actions the Board:

Organizational and Administrative Matters

- Adopted a three-division structure as the basis for implementing permanent management arrangements for the Operations and Development Directorate (a System Planning Division, an Engineering Division and an Operations Division); asked the Director General to submit to the next meeting a proposed allocation of functions within the Directorate; and approved creation of Director positions to head each of these divisions (at grade D), and three secretarial positions.
- Approved the appointment of Dr. Matt Nilson as Director of Business Planning, and noted that Dr. Joseph Pelton has been named Executive Assistant.
- Approved the net addition of nine new positions and upgrading of one position in the office of the Director General, and two new positions in the Administration Department.

Technical and Operational Matters

- Authorized the Director General to commence the necessary steps to negotiate with COMSAT suitable terms and conditions for TTC&M services at Paumalu and Andover from February 13, 1979, through December 31, 1979, and to extend through December 31, 1979 the existing contracts with EMBRATEL, INTELCAM, OTC(A) and Telespazio.
- Approved the solicitation of proposals for TTC&M services after 1979 by a network of nine antennas, and for in-orbit test antenna facilities and services in the two most desirable geographic areas (North Atlantic/Indian and North Indian/Pacific), noting that all Signatory bids will be evaluated.
- Approved a procurement schedule for these TTC&M facilities which calls for receipt of proposals on November 25, 1977; Board review of proposal evaluations in February 1978; and Board approval of negotiated contracts in March 1978. The stations are to have completed testing and acceptance by September 1979.
- Requested the Advisory Committee on Technical Matters (BG/T) to present an analysis of satellite resources to the next meeting, when the Board will consider operational plans, and noted the Director General will report at that time on the possibility of extending the INTELSAT IV-A procurement option beyond the present expiration date of December 31, 1977.
- Authorized the launch of INTELSAT IV-A (F-3), as the spare satellite over the Indian Ocean Region at a nominal position of 60°E. Longitude; noted that the INTELSAT IV-A launch services agreement with NASA for the second three INTELSAT IV-A satellites has been signed.
- Requested the Director General to advise NASA that the Board was not prepared to make a financial commitment to the SSUS-A at this meeting; however, the Board continues to have an interest in the STS/SSUS-A launch arrangement and will consider the matter again at its next meeting when it anticipates having all necessary information. The Board requested the BG/T to examine in depth the STS/SSUS-A and Ariane programs and schedules, and the structural and apogee motor changes required on the INTELSAT V for Ariane compatibility, and noted the Director General will establish commitment dates and costs of alternative launch services.
- Requested the Director General to assess INTELSAT V program management, and overall program status, and evaluate the availability date of the first spacecraft.
- Authorized submission to the October 1977 meeting of the Technical Panel of the INMARSAT Preparatory Committee of a paper summarizing means by which INTELSAT could provide maritime service to INMARSAT.
- Requested the Director General to bring to the attention of Parties, Signatories and INTELSAT Administrations, that due to reassessment, it would be desirable that in the allocation of frequencies for intersatellite links the frequency bands of 24.25-25.25/31.8-32.8 GHz be the preferred option.
- Approved agreements for the preemptible lease of one-quarter transponder to Oman and one and one-half transponders to Saudi Arabia to meet domestic telecommunications requirements.
- Approved, subject to specific operating conditions in each case, the U.S. application for a Kwajalein Island station and Oman's application for stations at Muscat and Salalah; granted formal approval for Norwegian stations at Eik, Ekofisk and Frigg; and extended to March 1, 1978 temporary approval for two Saudi Arabian transportable stations.

Financial and Legal Matters

- Requested the Director General to provide a five year financial plan comprising the budget year plus the following four years, for consideration each year in conjunction with

(continued on next page)

Third quarter earnings reported; 10¢ increase in quarterly dividend declared

COMSAT has reported consolidated Net Income of $9,547,000 (95 cents per share) for the third quarter of 1977, an increase of $1,940,000 (19 cents per share) from the third quarter of 1976. COMSAT also reported that the Board of Directors, at its monthly meeting, declared a quarterly dividend of 35 cents per share, an increase of 10 cents from the 25-cent dividend paid in each of the past 13 quarters. The dividend was payable on December 12, 1977 to shareholders of record as of the close of business on November 11, 1977.

In its calculation of Net Income for the third quarter of 1977 and 1976, COMSAT excluded $15,803,000 (80 cents per share after taxes) from its third quarter 1977 global system revenues and $13,933,000 (70 cents per share after taxes) from its third quarter 1976 global system revenues—amounts COMSAT was required to place in escrow under an order issued by the Federal Communications Commission (FCC) pending the outcome of judicial review of a December 1975 FCC rate decision.

The 19-cent-per-share increase in earnings for the third quarter of 1977 from those of the third quarter a year ago is attributable to increased Operating Revenues from the expansion of MARISAT and COMSTAR services and the lease of an increased number of global system half-circuits, and to lower depreciation charges related to extending the life for that portion of each of the MARISAT satellites dedicated to U.S. Navy service from three to five years. The increases were partially offset by a decrease in Other Income attributable to the write-off of deferred aeronautical satellite system costs and the payment, pending appeal, of an assessment for additional Federal income taxes for the years 1973 and 1974.

Operating Revenues for the third quarter amounted to $44,056,000, exceeding those of the third quarter a year ago by $7,787,000, or about 21 percent. The increase resulted from revenues received from MARISAT and COMSTAR services provided by COMSAT General Corporation, COMSAT's wholly-owned subsidiary, and from continued growth in the number of half-circuits leased by COMSAT to its carrier customers for global communications. At September 30, 1977, the number of half-circuits leased by COMSAT in its global system operation was 4,856, an increase of 97 from June 30, 1977, and 727 from September 30, 1976.

COMSAT GENERAL accounted for $15,361,000 of COMSAT's third quarter Operating Revenues and 13 cents per share of consolidated Net Income. For the third quarter of 1976, COMSAT GENERAL's operations accounted for $10,235,000 of Operating Revenues and 12 cents per share of consolidated Net Income.

Operating Expenses, including income taxes, were $32,348,000 for the third quarter, an increase of $2,125,000 from the third quarter of 1976. The increase resulted from higher income taxes associated with increased revenues, which were offset to a large extent by a reduction in the depreciation expense associated with the useful life for that portion of the three MARISAT satellites dedicated to U.S. Navy service. The useful life was changed when the Navy in July agreed to extend its use of MARISAT satellites from three to five years. The change resulted in a reduction of $6,716,000 (35 cents per share after taxes) in the depreciation expense for the first nine months of the year, all of which is reflected in the third quarter earnings.

Other Income, after provision for income taxes, showed a loss of $2,161,000 for the third quarter, a decrease of $3,722,000 from the third quarter of 1976. The decrease in Other Income is more than accounted for by the write-off of deferred aeronautical satellite system costs and the payment of interest on a tax assessment which is being appealed. Deferred aeronautical satellite system costs totaling $5,298,000 (27 cents per share after taxes) were written off after the Federal Aviation Administration (FAA) notified COMSAT GENERAL that the FAA had cancelled its Request for Proposal to COMSAT GENERAL for Aeronautical Satellite (AEROSAT) Services. Additional Federal income taxes for the years 1973 and 1974 have been assessed against the Corporation, and the Corporation plans to appeal the assessment. The Corporation elected to pay the assessment in order to stop the accrual of interest on the amount in question.

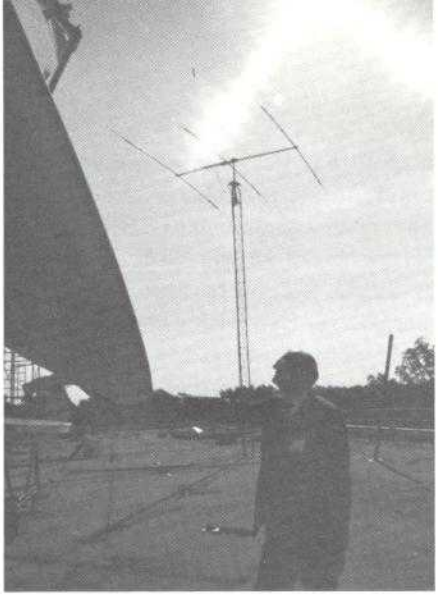
For the first nine months of 1977, consolidated Net Income amounted to $27,393,000 ($2.74 per share), $2,104,000 (21 cents per share) less than for the first nine months of 1976. The decrease primarily was related to the exclusion from COMSAT global system revenues for the first nine months of 1977 of $45,163,000 ($2.28 per share after taxes) which COMSAT was required to place in escrow under the FCC order. For the first nine months of 1976, during which the escrow requirement was in effect for only three and one-half months, a total of $16,033,000 (81 cents per share after taxes) was required to be placed in escrow.

(contined from page 9)

the annual budget, and approved the development of supporting documentation and analyses for use in examining annual financial statements.

- Requested the Director General to study the legal and financial aspects and the practicality of implementation of all proposals before the Board relating to the Ivory Coast's proposed new policy for utilization of the INTELSAT space segment by developing countries.

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

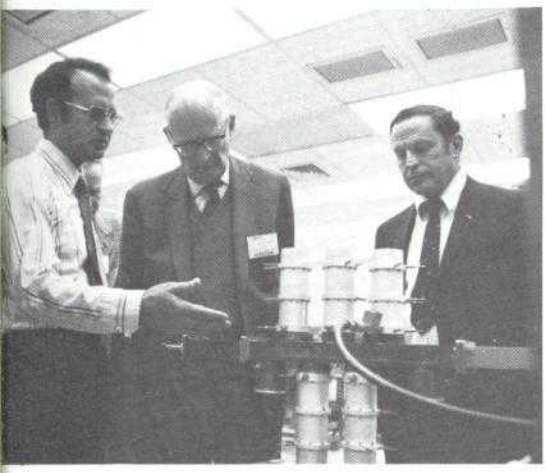


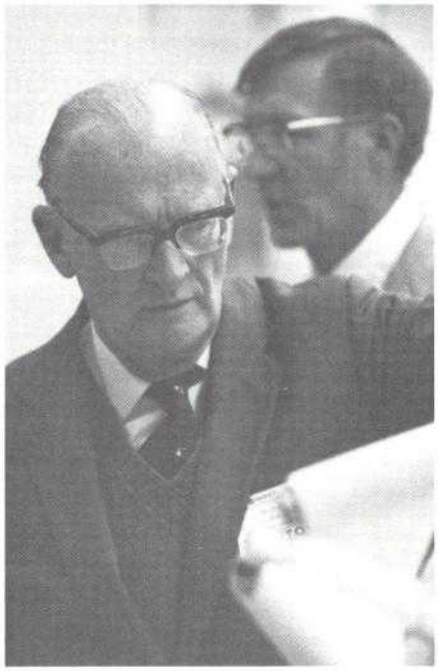
Predictor of global satellite system visits Labs

Well-known science fiction writer Arthur C. Clarke, accompanied by Mr. Fred Durant, Assistant Director for Astronautics of the Smithsonian Air and Space Museum, visited COMSAT Labs recently and was conducted on a tour of the facility by Dr. B. I. Edelson, Director, COMSAT Laboratories.

Mr. Clarke expressed to Labs employees his pleasure at seeing that the Labs had "advanced the state of satellite communications far beyond and far more rapidly than any of my predictions some 30 years ago."

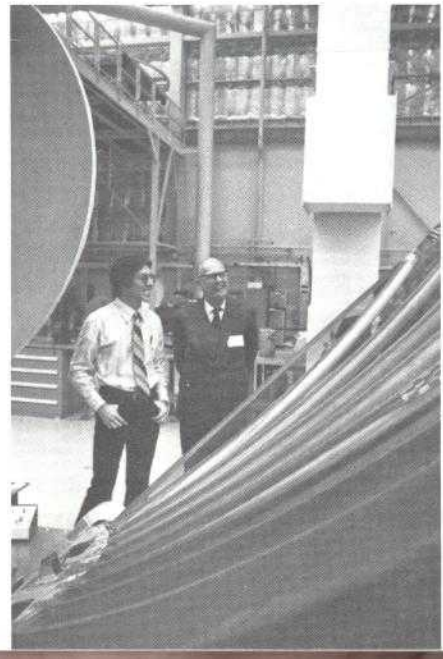
Afterwards, in a session for the entire Labs staff, Mr. Clarke showed two short movies and some slides of his home in Sri Lanka with its rooftop antenna which picked up programs from NASA's ATS-6 satellite when it was on station over India.





Mr. Clarke is one of the world's leading science-fiction writers and authorities on space and underwater exploration. Co-author of the screenplay for the film "2001: A Space Odyssey," which was based on one of his short stories, he is thought to have originated the concept of using satellites for global communications. In a farsighted article published in 1945, he described with remarkable accuracy how three satellites placed in sychronous orbit could provide communications coverage worldwide.

CANDID PHOTOS OF MR. CLARKE TAKEN BY LABS PHOTOGRAPHER BILL MEGNA.



COMSAT requests OK from FCC to build new facilities near Etam

COMSAT, as Manager for the Joint Owners of the Etam, West Virginia, earth station, has filed with the Federal Communications Commission an application to construct new earth station facilities at Etam and at Lenox, West Virginia, for commercial satellite communications.

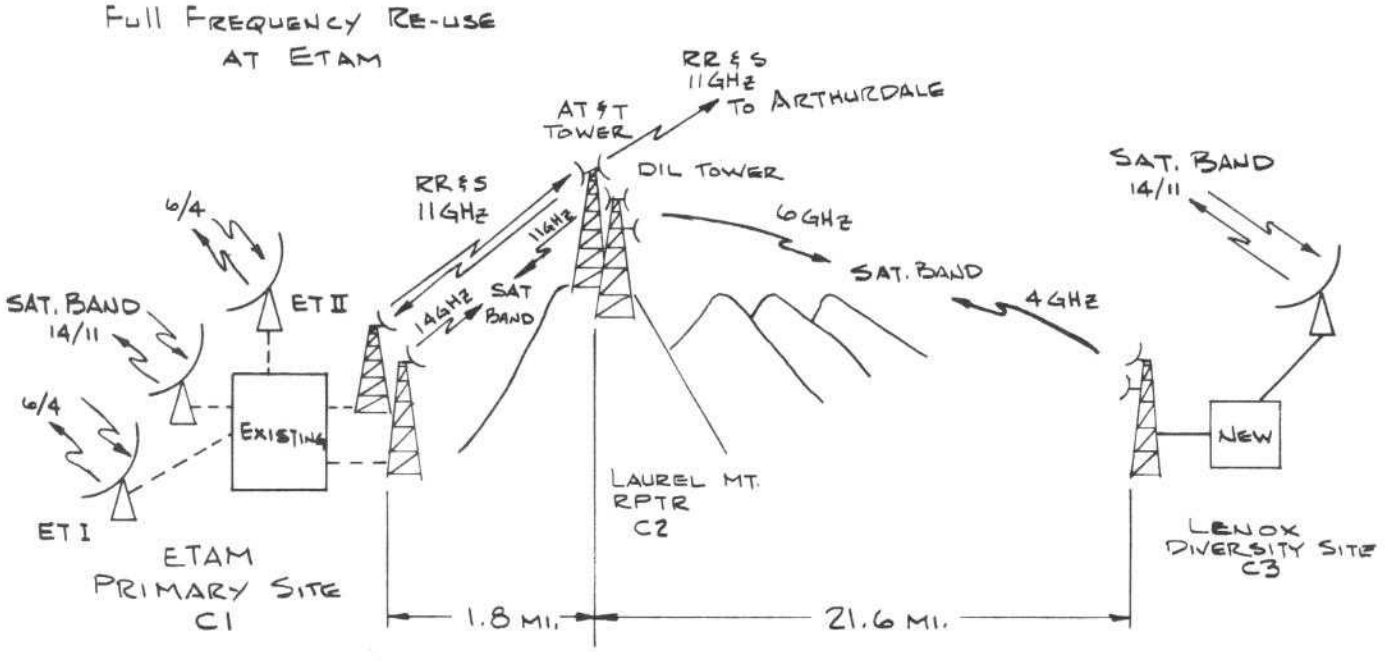
The new satellite facilities will represent an investment of about $13.4 million and will consist of a dish-shaped antenna measuring approimately 56 feet in diameter at each of the two sites, related electronic equipment and a microwave link to interconnect the two sites.

Plans call for the new earth station equipment to be completed and ready for operation in early 1980 to work with a new 12,000-circuit INTELSAT V communications satellite scheduled for launch in late 1979. The INTELSAT V is planned to be the primary means of communicating via satellite to countries in the Atlantic Region in the 1980s.

The advanced design of the INTELSAT V satellite incorporates the use of frequencies twice as high as those used by today's satellites. These higher frequencies, in the range of 14 and 11 gigahertz (billions of cycles per second), are subject to interference during periods of heavy rain, which are prevalent in the Eastern United States. In order to minimize this interference, a diversity site with a 56-foot antenna will be constructed at Lenox, approximately 22 miles north northeast of the primary site at Etam. The diversity site was selected because of the minimal possibility that heavy rains would occur simultaneously at Lenox and Etam. The diversity antenna at Lenox will be connected to the 56-foot antenna at Etam by means of a two-hop microwave Diversity Interconnection Link.

The primary 56-foot antenna will be co-located at the existing Etam earth station complex, which is approximately 200 miles west of Washington, D.C. The Etam facility now has two communications antennas (one is 98 feet in diameter; the other, 105 feet) and related electronic equipment which operate with INTELSAT IV-A satellites located over the Atlantic. Today, Etam links the United States with some 60 countries in Latin America, Europe, Africa and the Middle East. Ultimately, the new West Virginia facilities will operate at the higher frequencies with more than 30 Atlantic Region stations.

Located near Lenox, West Virginia, less than 25 miles from the Etam Station, the Diversity Interconnection Link (DIL) facility will be unattended and contain only the required basic broadband transmission and power equipment. The antenna height, including pedestal building, will be approximately 78.7 feet (24 meters) above ground level. The antenna will measure 56.7 feet (17.3 meters) in diameter. A 95-foot "K-2 type" microwave tower will be erected behind the building and antenna to interconnect the Lenox Station with Etam via the Laurel Mountain Repeater. Only 14/11 GHz traffic will be routed through the Diversity Site.



14/11 GHz EARTH STATION COMPLEX

COMSAT announces offer to purchase 2,000,000 shares of its Common Stock

Editor's Note. Readers will note an inconsistency between the head and the story. This is the result of a subsequent determination by COMSAT to make the maximum purchase after PATHWAYS had gone to press (see PIO News Release 77-32, 12/2/77).

On November 11, 1977, COMSAT announced it is making an offer to purchase 1,500,000 shares of its Common Stock for $37 per share in cash. The Corporation may elect to purchase up to an additional 500,000 shares for a maximum purchase of 2,000,000 or 20 percent of its shares outstanding (See Editor's Note). Unless extended, the offer was to expire on December 6, 1977, at 5:00 p.m., Chicago Time.

The Board of Directors determined that a purchase by the Corporation of its shares is an appropriate use of cash resources in light of the cash flow which the Corporation projects in relation to its anticipated cash requirements. The purchase of shares will have a favorable effect on earnings per share and book value per share because of the fewer shares that will be outstanding after the purchase.

Although the Corporation has no acquisitions pending or under negotiation, the shares purchased will be available for use in possible future acquisitions. In addition, the purchase of shares will be a preliminary step toward a later restructuring of COMSAT's capital accounts to include a substantial amount of debt, consistent with the Federal Communications Commission's position that for ratemaking purposes the Commission would assume a substantial percentage of debt in COMSAT's capital structure. The Corporation now is debt free.

The Corporation will pay to brokers, dealers, commercial banks or trust companies solicitation fees at the rate of 30 cents for each share purchased by the Corporation pursuant to the offer, the tender of which had been solicited by them. The fee payable to any one broker, dealer, commerical bank or trust company is subject to a maximum of $5,000 with respect to any single beneficial owner. The First Boston Corporation will act as Dealer Manager for the Corporation in connection with the offer.

The offer is not conditioned upon any minimum number of shares being tendered, and the Corporation is obligating itself to purchase all shares duly tendered up to 1,500,000 shares.

If more than 1,500,000 shares are tendered, the Corporation will have the option to purchase any or all of the excess, but in no event will it purchase more than 2,000,000 shares. If the Corporation elects to purchase more than 1,500,000 shares, it may need to incur short-term borrowings for this purpose. An application has been filed with the Federal Communications Commission to obtain the required approval to borrow up to $25 million.

In the event the offer is over-subscribed on or before December 6, 1977, the Corporation will make purchases on a pro rata basis, except that all shares duly tendered by any shareholder of record on November 11, 1977, of 10 shares or less will be purchased if the holder tenders all such shares.

Neither COMSAT nor its Board of Directors makes any recommendation to any shareholder to tender or not tender any shares, a decision which each shareholder must make. Members of the Board of Directors and officers of the Corporation are not eligible to tender shares owned by them.

Employees to participate in Stock Ownership Plan

COMSAT employees were notified in early December of the initial amount of their participation in the newly established Employee Stock Ownership Plan (ESOP). After the Corporation's Federal Income Tax return for 1976 was filed in September, 80,300 shares of COMSAT stock were purchased for $2,521,140. The average price per share was $31.40

The amount contributed to the Plan by COMSAT for each year is determined as a fixed percentage of its investment tax credit for new property acquired during that year. Since property additions vary widely from one year to the next, the ESOP contribution will vary in the same manner.

The cost of the shares allocated for 1976 to the accounts of individual employees was equal to approximately 9.2 percent of the employee's 1976 earnings. Subsequent annual contributions are unlikely to be as large.

Under the Plan, the Corporation transfers funds to a trustee which purchases COMSAT stock on behalf of the participants and holds the stock in individual employee accounts until it is time for distribution to the employee, or his beneficiary. The shares for each year are distributed after they have been in the employee's account for seven years, or upon his retirement, termination of employment, death or disability.

Worth Noting

William R. Schnicke, formerly a Staff Scientist with the Advanced Systems Division, has joined the staff of the International Operations Division as Manager, Space Segment Evaluation.

Dr. P. L. Bargellini, Labs' Senior Scientist, gave the opening address at the International Institute for Communications XXV Meeting in Genoa, Italy, in October.

William J. Keck, Manager, INTELSAT Space Programs, INTELSAT Management Division, was awarded the MSSS degree in Telecommunications Operations from the George Washington University Graduate School of Arts and Sciences.

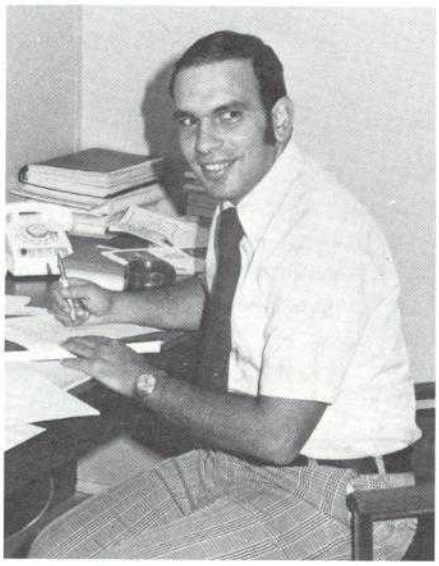
Educational Assistance program appeals to degree and career-oriented employees

BY CHERRYL HOLT

One of the many benefits available to COMSAT employees is educational assistance. This plan, which started in 1967, has made it possible for many employees to earn degrees and take individual courses in career planning.

Ellen Abelende

"It allows me to work and further my education, hopefully leading to greater career opportunities."



Omar Atia

"I am enrolled in a Ph.D program in Electrical Engineering. COMSAT's assistance has allowed me to enhance my skills and career opportunities."

COMSAT employees take advantage of educational assistance on a higher percentage than the national average—6.7 percent for COMSAT compared to 4.6 percent for the country, according to William B. Lockett, Assistant Director of Personnel, EEO & Human Resources Development.

Requirements of the plan are very simple. An employee becomes eligible for assistance after completing six months of full-time employment. The course(s) applied for must have academic credit; must have a recognized period of instruction (semester, quarter) and must be taught by an accredited college, university, high school or business/technical/correspondence school. Correspondence courses are permitted only if the course is not offered by a local institution, or if the applicant has justifiable reasons preventing classroom attendance. Originally, correspondence courses were taken mostly by Earth Station employees. Now, more employees are involved, due to the increase in institutions offering degrees through correspondence courses.

To qualify for educational assistance, the course(s) applied for must relate to the employee's job and career area, or assist the employee in qualifying for promotional or reassignment opportunity. Areas of highest concentration are advanced engineering and the sciences and business

Ms. Holt is in the COMSAT Office of Public Information.

Michael Kelley

"It is financially difficult to go to graduate school and begin a family. The EAP lets me stay up-to-date in my field."

Eli Wachsberg

"An incentive vehicle to better your education. I don't think I could have done it without COMSAT's help."

Pat Cramer

"EAP is allowing me to pursue my bachelor's degree. It is a meaningful benefit, without which it is doubtful I would have been able to attend school."

administration. Cultural, aesthetic or hobby related courses are not covered by the plan.

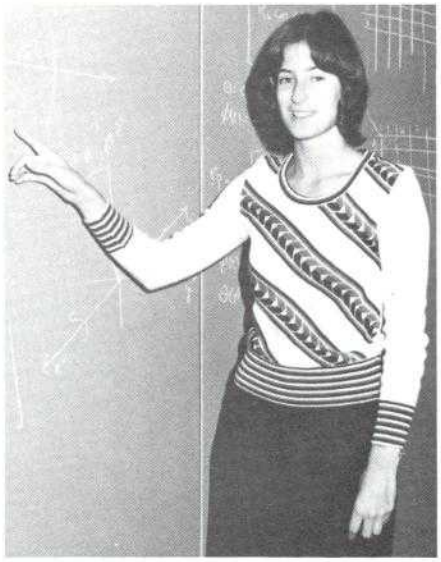
Upon successful completion of the course(s), with a grade of "C" or better, the company will reimburse the employee in full for the course(s). Costs not reimbursable are books, supplies, noneducational or optional fees (travel to and from school, meals, tutoring/athletic/matriculation/graduation fees). The company normally reimburses the employee upon successful completion of courses; but if financial difficulty on the applicant's part can be established, up to 70 percent of the tuition costs will be advanced. In 1976, reimbursement costs were $37,505.79 to 97 employees. Average reimbursement per recipient was $386.66. Over the 10 years the program has been in existence participation has constantly increased. In 1967 only 12 people took advantage of the plan.

COMSAT's educational assistance plan has been very successful over the years, with nearly everyone participating qualifying for reimbursement. To continue this record of success requires the support of employees and their supervisors. Interested employees should keep informed on classes offered at various schools. The Personnel Office has college and trade school bulletins available for this purpose. When an appropriate course is offered, the employee should complete the necessary form for educational assistance (CSC 187) and apply to the school offering the course.

Supervisors are reminded to provide employees with guidance and encouragement in selecting courses, keep informed on employees' progress and administer educational assistance expenses within approved departmental budgets. Employees or supervisors desiring more information on general questions, applications, etc., should contact Glenda Cooper, ext. 6361; and for more specific questions, Teta Powell, ext. 6362 or William Lockett, ext. 6360.

Phyllis Rhoe

"Participation in the program stimulates my career development in the field of Business Management."



Carol Graves

"I am working toward a Master's degree in Applied Math; the program has allowed me to begin earlier—and finish sooner—than I could have on my own."

Linda Kortbawi

"The Educational Assistance Program permits me to further my career opportunities within the Corporation."

Donald Gleason

"I plan to obtain a BS degree at GWU in Physics. My academic work has helped me considerably in understanding the complexities of earth station equipment and operations."

Barbara Moseley

"A fringe benefit most of us don't think about as we do vacation or sick leave, but it is readily available when you decide to update or enhance your work-related skills."

PHOTOS BY MIKE GLASBY

JAMESBURG HISTORY

(Continued from page 4)

Other countries, including the Russians, made an effort to spread their influence into California, but the strangest foray occurred in 1818 when Monterey was occupied by the French pirate Hippolyte de Bouchard, who had served with the patriot navy of the "Republic of Buenos Aires." So, in a sense, it might be said that California was once occupied by Argentina although Hippolyte was privateer.

Superstitious minds were not idle during this period of colonization and the tale was told of a haunted place not too far distant from the Mission San Carlos known simply as Carmel Hill today but then, by the Spanish and the Indians before them, as the "Devil's Elbow," a haunted place where fog ghosts lived.

Here lurked the spirit of La Gallina y Gallinitos (the hen and little chickens), whispered about the length of Alta California—for the blackest luck would befall the person who saw La Gallina, or heard the plaintive cheeping of Las Gallinitos. To this hill a gentle, beloved padre of Carmel was trailed by a *mal hombre* (bad man) who knew that the padre carried in a sack a hen and seven chicks, intended for a sick man in Monterey. Here the *mal hombre* brought his pistol butt down upon the head of the holy man, snatched the sack and hurried away. But when he reached home he found the sack empty.

He retraced his steps and was amazed to find the hen and her young scratching diligently in the moist earth beside the padre. Again he collected his booty—and again found the sack empty when he reached home. For the third time he returned to the hillock. The hen and chicks were there scratching industriously. The *mal hombre* glanced fearfully at the fallen padre. The holy man was dead. The robber raised the pistol to his own head and pulled the trigger.

John James had brought his family into the valley from North Carolina, settling along the Cachagua Creek in 1886 on land adjacent to what is now called Hastings Reservation. According to evidence found by the Archaeology Department of the University of California, the Valley's earlier Indian inhabitants must have been small and nomadic. The evidence indicated that caves found near Chews Ridge (named after Charles Chews who had married the Jameses' daughter Eleanor) were often used by the "Esselen" Indians, numbering only a few hundred individuals, and which tribe became extinct shortly after contact with the Spanish missions.

The evidence found is of importance, however, because of the light these findings throw on the Esselen culture. In their diggings the archaeologists found a female child buried in the caves which they estimate was buried about 1825 and possibly earlier. Later the caves were used by the "Costanoans" Indians on their travels from the Carmel River in search of wild game. Indian writings are visible today on the walls of the caves.

John R. Swanton in his *Indian Tribes of North America* provides us with a little more information on the two tribes which roamed the region of the Jamesburg Station. The Costanoans (taken from the Spanish "Costanos" meaning "Coast People") inhabited the coastal area between San Francisco south to Point Sur and inland probably to the Mount Diablo Mountain Range.

Among the tribe's subdivisions were the Monterey Costanoans occupying the area from the Pajaro River to Point Sur and the lower courses of the Salinas and Carmel Rivers, and the Soledad Costanoans on the middle course of the Salinas River. Costanoan villages were situated on Carmel River (Rumse-n), on the coast north of Point Sur (Sirhinta-ruk), near Monterey (Tamo-tk) and near the Soledad Mission on the Salinas River (Wacharo-n).

It is estimated that there were about 7,000 Costanoans in 1770, the year Fr. Serra founded the Mission San Carlos at Monterey. Today there are only a few mixed-blood descendants remaining. The 1910 Census showed 10 remaining, and in 1930, none.

The Esselens probably took their name from the village whose significance, according to Swanton, is unknown. Originally, the tribe was given the status of a distinct stock but is now placed with other Indian tribes then located to its north and south.

JAMESBURG COMMUNICATIONS

(Continued from page 7)

frequencies. Signals are transmitted in the six-gigahertz band, (six billion cycles per second) and received in the four-gigahertz band. An auto-track system is normally used to keep the big antennas accurately pointed at their respective satellites to within hundreths of a degree. The antennas also may be moved by manually operated controls.

Communications signals received from the satellite are only a fraction of a watt in power, mere space whispers. They are amplified a millionfold, funneled by an antenna into super-sensitive receiver-amplifiers located in the equipment rooms, again boosted in power and then processed through the control building.

All forms of communications are processed through the station at the speed of light (186,000 miles per second). The voice quality of an individual telephone call is as clear as if it were being made from next door. Television, teletypewriter, high-speed data and facsimile are also of very high quality, meeting or exceeding rigid international standards.

The tribe was located on the upper course of Carmel River, Sur River and the coast from Point Lopez almost to Point Sur. Among the few tribal villages was Echicat, situated approximately 12 miles north of Mission Carmelo. History records the Esselens as numbering only about 500 in 1770. They are now extinct.

Three days before Christmas of 1886, the Jamesburg Post Office was formally established and Mrs. James became its first postmistress. In addition to her postal duties she also performed as the local midwife. Consequently, the post office became a popular place; neighbors in the Jamesburg/Cachagua area would come by to pick up their mail and to visit a while—it became the center of valley activity.

Almost three years to the day after their settling along the creek, in 1889, flooding, resulting from exceptionally heavy rainfall, carried away the Jameses' barn, dairy building and part of the orchard just planted. All that remained of the old homesite was a single almond tree. (Today a monument erected by the Monterey County Historical Society and dedicated on "Jamesburg Day" in June 1959 stands at the original post office site.)

Moving inland, the Jameses reestablished their home and post office on what is now known as the Lambert Ranch. Later the James Ranch became a stagecoach rest station for stagecoaches enroute from Salinas to the Tassajara Springs "health spa," well known in the late 1800's and early 1900's for its hot, mineral-laden waters. Today the Springs is a Buddhist Retreat.

After the death of her parents, Mrs. Chews (the former Eleanor James) operated the ranch and post office until 1920 when it was sold to the William Lambert family which family continued post office operations. With the coming of the automobile, there was no longer a need for a rest station at Jamesburg. Area growth impressed the residents with the need for a library and a branch of the County Library was added to the post office. William Lambert's son, Bill, and his family still live on the ranch but the library is no longer operational. Lambert is one of the leading "wild boar" hunting guides in California.

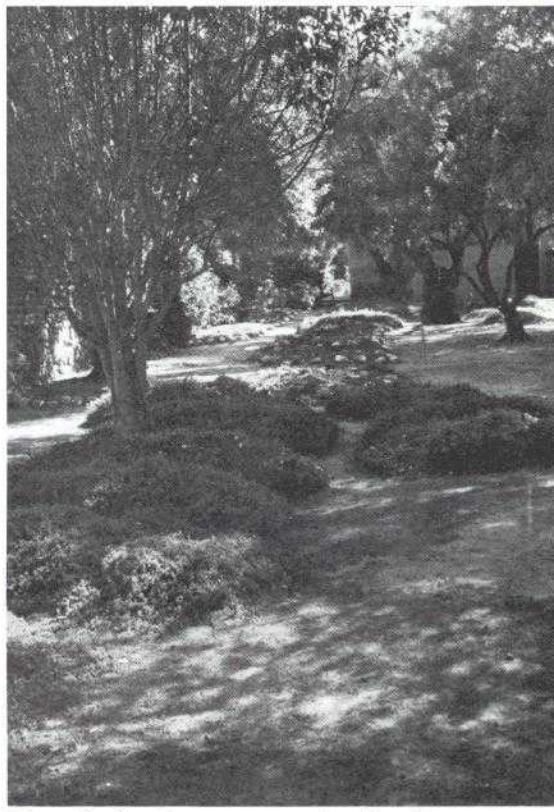
Many of the descendants of the first homesteaders in the Jamesburg/Cachagua area still reside there and have many interesting stories to tell about the earlier days. For example, the early settlers were able to file on three kinds of claims; homestead, preemption and timber, each of 160 acres. A family of several members could thus acquire enough of these 480-acre tracts to make a fair-sized cattle ranch.

Numerous transfers by sale or inheritance soon resulted in the large present-day ranches. A settler could lay claim to more land by "proving up on" the homestead. Cabins were built on sled runners so that when the homesteader moved to settle a new claim he did not have to build a new cabin.

The winters were hard on the early settlers and times would get hard for real money. Bears were trapped, caught and taken by ox-cart to nearby Monterey to be sold for the then popular "Bear and Bull Fights" which were to the early settlers what the Bull fights are today to the people of Spain and Mexico.

Another source of income was the capture and sale of ladybugs. In the caves near Chews Ridge the bugs were plentiful. The ranchers would gather them in handfuls, pack them in huge jars and sell them to other ranchers in Salinas for their crops. The ladybugs were so popular with the farmers (the bugs were used much like the insecticide of today) that they were shipped all over the United States and even to England. To this day some ranchers still make use of the ladybugs.

In 1861, Geologist W. H. Brewer visited the area and wrote of his trip from Monterey up the Carmel Valley. "We followed the road about 20 miles from Monterey. I climbed the mountain for Geology, the hills were covered with oats, with here and there trees . . . oaks and pines. Some of the oaks were noble ones indeed. I measured one of the oaks, with wide spreading and cragged branches, that

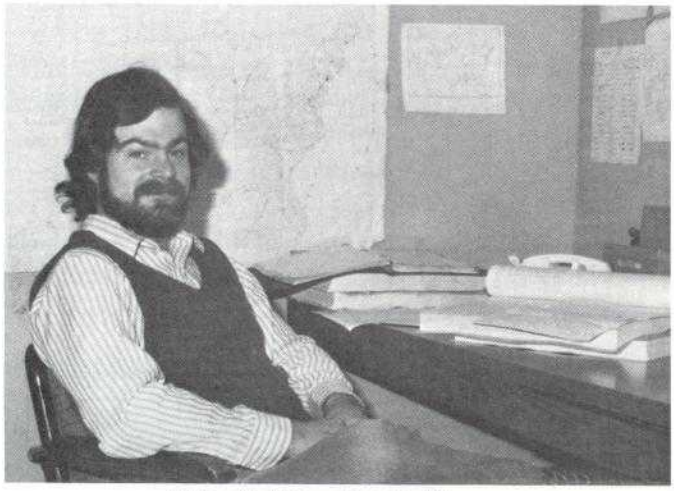


Mounds in the cemetery beside the Carmel Mission church mark the burial spot of more than 3,000 Indians.

was 26 1/2 feet in circumference. Then I struck out for the highest mountain, but backed out before quite reaching it, for the traces of grizzlies and lions became entirely too thick for anything like safety. But what a magnificent view I had. A range of hills 2,000 to 3,000 feet high extending from Monterey to Soledad, to the northwest lay the Bay of Monterey, calm, blue and beautiful."

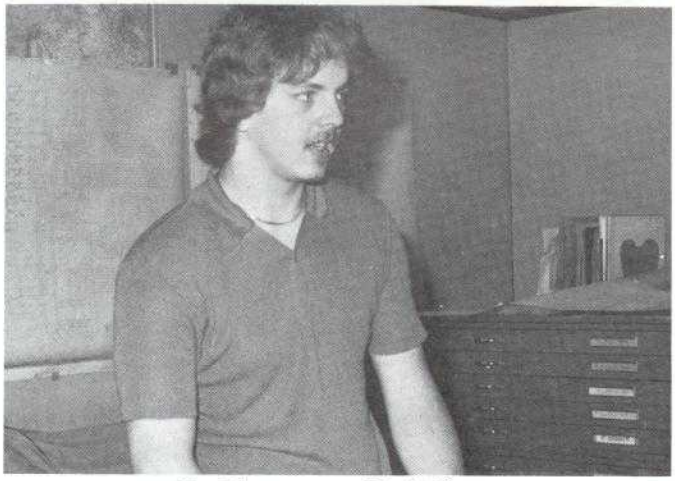
Know these people:
they're the members
of your

Plaza First Aid Team



Mike Jeffries, Fourth Floor

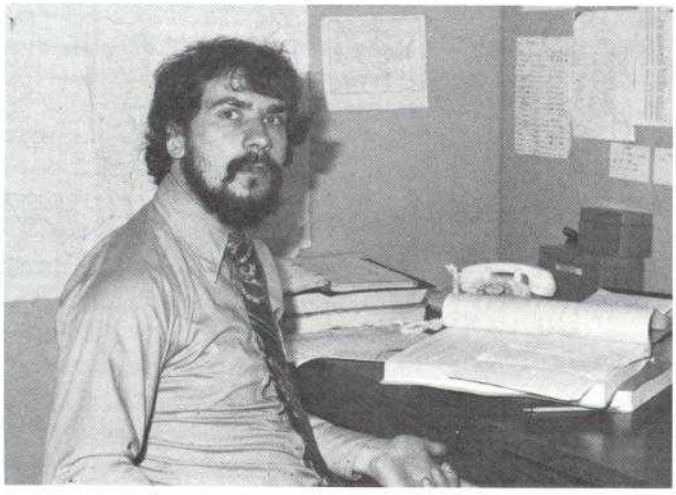
Gene McCarthy, Fourth Floor



Jim Narramore, Sixth Floor

Ivor Knight, Third Floor

Ed Mikus, Fourth Floor



Gus Souris, Third Floor

BY NANCY DOUGHERTY

Do you know what the Heimlich Maneuver is?

Could you give cardiopulmonary resuscitation or proper assistance to someone in shock?

If your answers to these questions are "No," then you should know there is a newly-formed First Aid Team here at the Plaza being taught these and other lifesaving techniques.

The First Aid Team presently consists of nine members who function as assistants to Hazeline Durant, Plaza Occupational Health Nurse, available in the event of emergencies and "on call" during her absence from the Health Unit.

If required to be absent from the Plaza during normal working hours, Nurse Durant designates a team member to stand by and notifies Personnel. A "hot line" in the Personnel Office, Extension 6060, receives calls relating to required medical assistance and alerts the duty team member to the problem and location.

The First Aid Team has received training in Multi-Media First Aid, Cardiopulmonary Resuscitation, and the techniques of taking blood pressure under the direction of Dr. Stanley Bialek, the Plaza physician. Future training classes are planned to insure and improve the quality of First Aid and emergency care. Courses will include Advanced First Aid and Emergency Evacuation and Assistance. Team members recently had the opportunity to apply their new skills by assisting in the Blood Pressure Screening Program. It is also planned to make use of their services in future Health Screening Programs.

Team members include Eugene McCarthy, Edward Mikus, Ivor Knight, Michael Jeffries, Richard McBride, Gus Souris, Blake Narramore and Patty Gray.

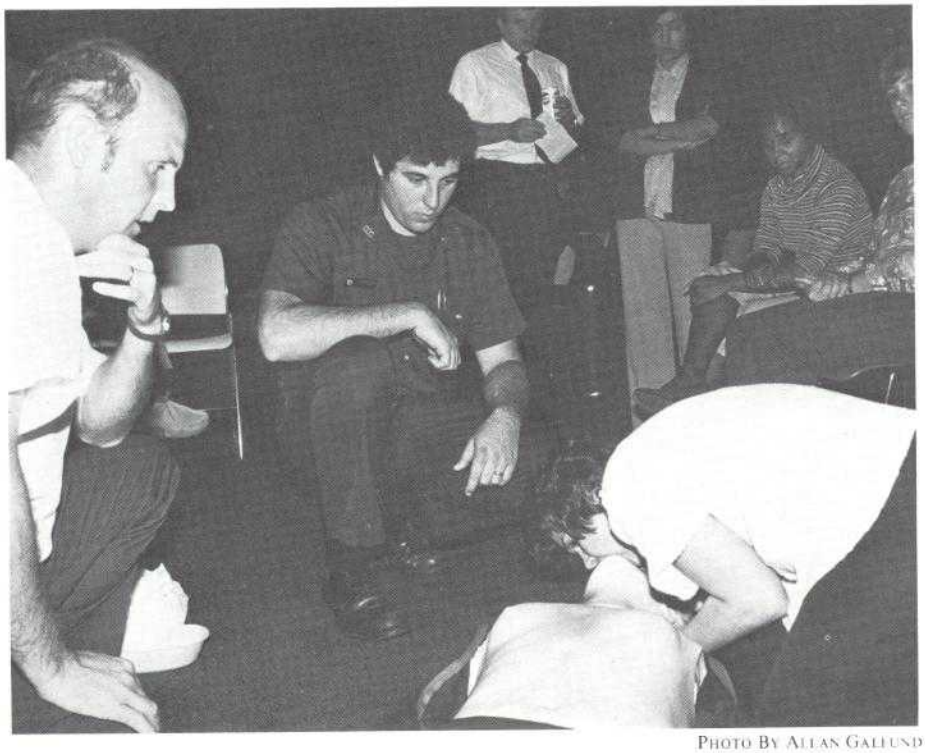


PHOTO BY ALLAN GALLUND

INTELSAT's Linda Clay provides mouth-to-mouth resuscitation during a training session under the watchful eyes of Lt. A. G. Murphey (left) of the District Fire Department and Firefighter Stuart J. Winokur while fellow team members observe.

Ms. Dougherty is Safety and Health Administrator for COMSAT.

Dick McBride, Sixth Floor

Patty Gray, Sixth Floor

PHOTOS BY MIKE GLASBY

Graphics Department's Kopp succumbs at 50

Lawrence B. Kopp, 50, Manager of COMSAT's Graphic Arts Department, died recently of a heart attack at the Fairfax Hospital in Falls Church. He resided with his family in Vienna, Virginia.

"Larry," as he was known throughout the Corporation, had been a COMSAT employee since 1966. Prior to joining COMSAT he had been a civilian employee with the Department of Commerce following an Air Force career of more than 20 years, a major portion of which was with the Joint Chiefs of Staff at the Pentagon. He retired in the grade of Chief Master Sergeant.

A native of Wisconsin, Kopp is survived by his mother, Mrs. June Kopp; wife, Evelyn; and children John, Michelle, Kathy, Jackie and Michael. Military honors were conducted at Arlington Cemetery where he is interred.

Plaza defeats Labs in tennis competition

Although proving more than a match for Plaza tennis players in singles competition, winning four of the six singles matches, the Labs team came in second best to the Plaza team which took two of the singles matches and all of the doubles to win the coveted Irving Novgrod Trophy.

A final tally in the singles competition showed Labs players Carl Wenrick, George Meadows, George Szarvos and Henry Williams the winners over Nate Tonelson, Alan Kasper, Dave Oliver and Mike Bush; and the Plaza's Bill Lowe and Dave Weil over Labbers' Bob Redick and Mary Penrose. In the doubles, Plaza players won all three matches with Paul Troutman and Rich Colino winning over Bob Strauss and Alby Williams, Dick McBride and Stan Schachne over E. Frey and P. Neyret, and Phil Caughran and Mike Kelley over G. Huson and S. Kuch.

The singles and doubles competition was held during August, September and October, with 34 entries competing in the singles and 15 teams in the doubles.

Kline and Loomis play the greens of Scotland

For the Golf aficionado, Pinthurst, Southern Pines and the Army-Navy courses are good for a while, but just for a while. Soon only the best will do. For this one must travel to where it all began — Scotland. Frances Kline, secretary to COMSAT Board Chairman Joseph H. McConnell, and Toni Loomis, secretary to Senior Vice President Lucius D. Battle, recently went on such a pilgrimage.

On a trip organized by International Golf, Toni and Fran made the rounds by traveling from town to town, seeking out new courses. Toni remembers the fast greens of the Scottish courses. "The balls really roll along." Fran remembers traps. "Lots of sand traps. All sizes and shapes."

During their nine day trip they played six times. Not bad considering they arrived and departed on rainy days. They usually stayed in a town two days, played a round or two of golf, and went on to the next town. Their tour took them to Perth, St. Andrews, North Berwick and Troon.

Fran Kline (left) and Toni Loomis with Scotland's world-famous St. Andrews Golf Course in the background.

Fran said she had known of such golf tours for years, but had never taken advantage of them before. "It was usually a question of finding the time or someone to go with. I mentioned it to Toni one day and she thought it would be a good idea. So we decided to go." They left for Scotland on September 28.

Toni has a condominium in Pinehurst, North Carolina, one of the country's top golf spots, and plays there regularly. She remembers the St. Andrews course being similar to that of Pinehurst. Fran usually plays on the Army-Navy course.

Both agreed it was a good golfing trip and excellent vacation. The only problem was it ended too soon.

Station managers and wives visit Plaza during Annual Station Managers Meeting

Managers from Andover, Brewster, Cayey, Etam, Jamesburg and Paumalu participated in the 1977 Earth Station Managers Meeting held at the Plaza. They were accompanied by their wives at the special invitation of COMSAT.

The meeting was conducted in two phases with the first being a visit to the Etam, West Virginia, station, and the second conducted at COMSAT Headquarters. The Managers' wives were invited this year in the effort to aid the families of field personnel gain a better understanding of corporate goals and interests and to provide an exchange of information between the Personnel Office, Station Managers and their wives.

Phase One included a tour of the Etam Station, a discussion of the 14/11 GHz station plan, digital systems and other subjects of mutal interest. En route to Washington from Etam, the Managers and their wives stopped at the Labs for lunch. Managers discussed problem areas and items related to improved support with M & S Center personnel.

Phase Two, held at COMSAT Headquarters, included a welcoming presentation by Richard R. Colino, Vice President and General Manager, International Operations Division, followed by discussions concerning personnel, accounting and documentation; Permanent Management Arrangements; BG and BG/T activities; INTELSAT V and other operational matters. Attorney Robert Smith, of the Law Firm of Morgan, Lewis and Bockius, a guest of Personnel, led a discussion on the legal aspects of employee relations. Station Managers from COMSAT GENERAL'S stations at Santa Paula, California, and Southbury, Connecticut, also participated in the Personnel discussions.

During the meeting period, the wives toured the Etam facility, the Labs, the Operations Center, the Spacecraft Technical Control Center and participated in the discussions arranged by Personnel. A luncheon hosted by Mr. and Mrs. David S. Nye and a tour of "Olde Towne" Alexandria was also part of the wives' agenda. Judy Stotler and Shirley Fifield, wives of COMSAT'S A. J. Stotler and Donald Fifield joined in the discussions and tour.

Earlier, Station Managers and wives were guests at a luncheon hosted by W. B. Carroll, Assistant General Manager, U.S. Communications Systems. The annual meeting was concluded with a reception hosted by Mr. and Mrs. Colino and attended by COMSAT President and Mrs. Joseph V. Charyk.

Earth Station Managers are briefed on the INTELSAT V spacecraft by D. V. Neill, Assistant Vice President, Satellite Operations. Seated, left to right are W. M. Lauterbach, Brewster; Donald Fifield, Director, U.S. Facilities; W. L. Miller, Etam; Neill (at podium); J. P. Scroggs, Jamesburg; L. R. Rodriguez, Cayey; and J. R. Warren, Andover.

PHOTOS BY MIKE GLASBY

Informative discussions hosted by the Personnel Office were held with the wives of the Earth Station Managers during the Managers Meeting. Seated left to right are Doris Lauterbach, Elizabeth Warren, Shirley Fifield, Judy Stotler and Louise Scroggs; David S. Nye, Assistant Vice President; D. J. Chontos, Manager, Compensation and Benefits; and Teta Powell, Administrator, Human Resources.

Donahue again takes top honors at Bretton Woods Golf Tournament

COMSAT's Fall Golf Tournament was held in late September at Bretton Woods in Potomac, Maryland. John Donahue, Spring medalist, took top honors with a low gross score of 81. William Keck's 73 was low net, George Meadows had the longest drive (275 yards) on the fifteenth hole, while Roman Rollins and Leslie Goya made closest approaches to the pin. The outstanding shot of the day was Paul Fleming's 150-yarder from a trap on the seventh hole with a five-iron for a "birdie." Other winners were George Meadows for second low gross and Smith Rhodes, third low gross. Ed Knopick had second low net with Nate Tonelson third.

Bob Meyer

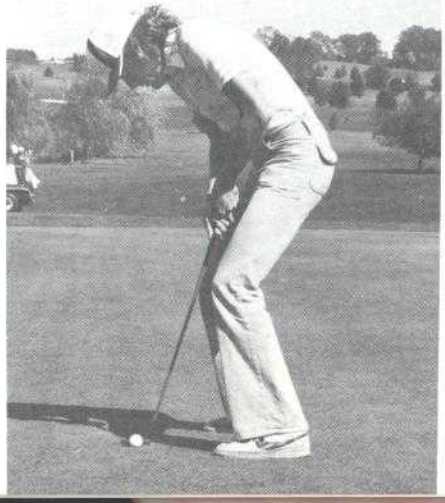
John Donahue

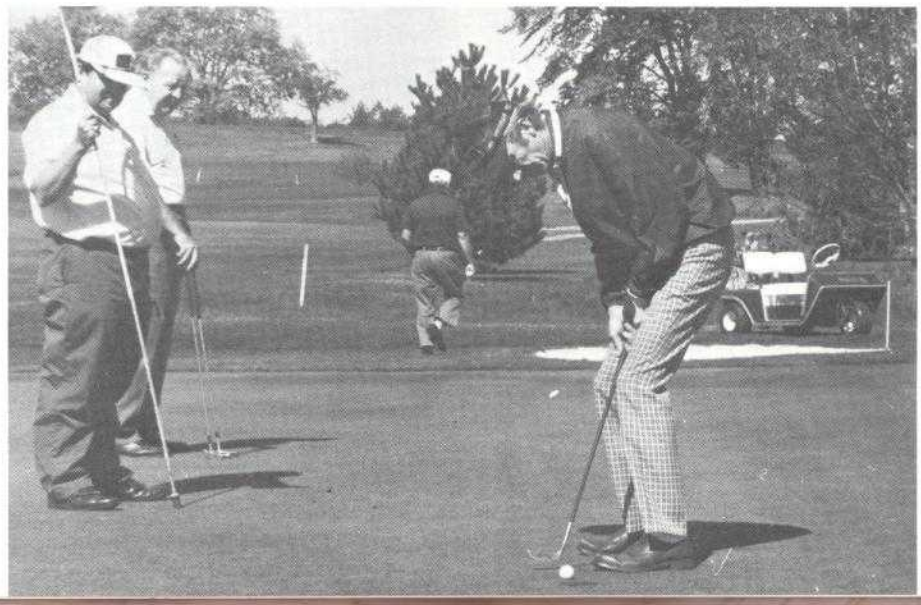
Elizabeth Martin

Paul Troutman

Mike Smith

Ed Wabnitz, Charlie Kelly and Joe Donnelly (left to right)





Network Bits

Field Correspondents

Andover
Joanne Witas

Brewster
Dorothy Buckingham

Cayey
John Gonzalez

Etam
Bev Conner

Fucino
Sandy Tull

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. **Herman Sauret** transferred to the Earth Station Engineering Division at Headquarters and was replaced by **C. J. (Neil) Merrill**, former Facilities Supervisor. **Larry White** was promoted from Utility Man to Junior Mechanic. **Alan Stinson**, part-time Utility Man, has been hired full-time.

Sven Engblom, Electronics Supervisor, visited Comtech Labs in Smithtown, New York, for acceptance tests on the Andover Transmit Rack scheduled for installation here before the end of the year.

Lebow Labs have been installing the new Antenna Surveillance Equipment consisting of two outdoor cameras for monitoring AN-2, AN-3 and the TTC&M Antenna. Located in the Control Room, the two black and white monitors will enable the crew to survey conditions around the antennas, a necessary requirement considering the snow factor and subzero weather. Nippon Electric Company has six technicians installing new order wire equipment.

Hunting season opening found **Dave White, Chuck Lepage** and **Don Bachelder** hunting deer in "no man's land"—the great northern woods of Maine. A going away party was held at the Madison Motel for the departing **Herman (Sauret).** He was presented with an engraved silver champagne bucket, a pen-and-ink sketch of the station and a gold-colored plumber's helper by his co-workers.

Motoring through Ohio and Pennsylvania after the Managers' Conference at Headquarters, Station Manager **Jim Warren** and his wife were alerted to "Smokeys ahead" on entering Pennsylvania on Interstate 70. Checking his speedometer Jim came up with "double nickels" (55 mph). Contentedly continuing on his way he was surprised by the signalling blue light ordering him to pull to the side of the highway and the trooper's statement that he had been clocked doing 72 mph. Jim explained that he had just put large size tires on his vehicle which probably threw the speedometer reading off. Would you believe the trooper bought the story and only issued Jim a warning? (Talk about the luck of the Irish!) —**Joanne Witas**

ETAM. Advance Industrial Security's **Chris Sigley** is back at work after a short stay in the hospital and recuperation period. **Andy Thomson**, Facilities Maintenance Supervisor, also spent time in the hospital and **Bill Bell**, Operations Technician, missed a few weeks work, the result of a fall and a broken ankle.

Andy Thomson and wife took a week's vacation and went camping at Cranberry and Williams River in West Virginia. **Henry Bulk** and wife vacationed in California for three weeks. **Chet Randolph** spent a week at Maryland's Eastern Shore.

Our CEA sponsored a corned beef and cabbage luncheon at the Canteen in late October. A Holiday Dinner was held at Alpine Lake in Terra Alta in November in lieu of our usual Christmas Party because of the bad weather and hazardous driving conditions usually existing during the regular holiday period.

On behalf of all of the staff of the Etam Station I would like to wish a Merry Christmas and a Happy New Year to all the members of our communications family. —**Bev Conner**

JAMESBURG. The CEA held a farewell party for **Bill Hamilton** at the Buckeye Restaurant in Carmel Valley. **Bill**, a Team Supervisor, has

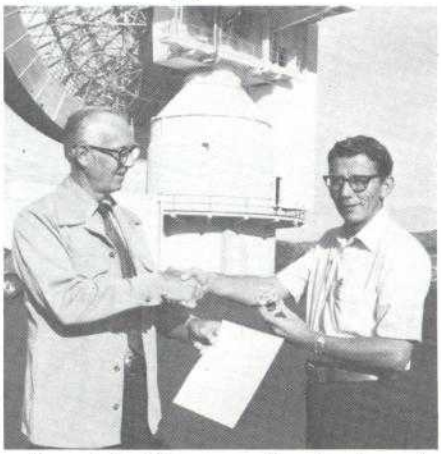
(Continued on next page)

CAYEY. A luncheon was held in the station lounge honoring our secretary, **Ada Gonzalez**, on completing her 10 years of service with COMSAT (photos below). Station Manager **L. R. Rodriguez** presented Ada with her service award. Employees' wives were invited to the luncheon.

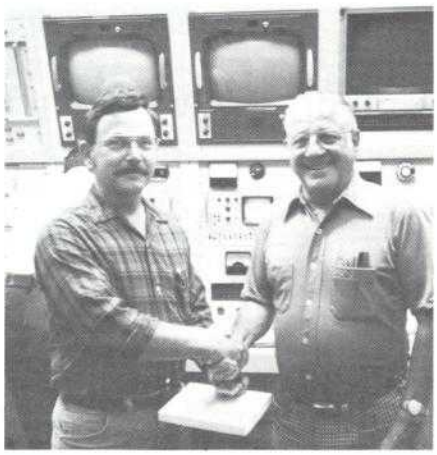
The staff welcomes back **Jose M. Negron** who left COMSAT to better his education. Jose graduated from Turabo University with honors and now holds a BBA with a concentration in management. —**John Gonzalez**

been transferred to U.S. Systems Plant. A COMSAT employee for 11 years, he came to Jamesburg from Andover in 1973.

Jack Inman, Station Engineer, has received his Ten-Year Service Award. In the photo below, Jack (right) receives a 10-year ring and citation from **Dr. Charyk** from Station Manager **John Scroggs**.



Receiving One-year Service Awards in the photos below are Electronics Technician **Donald Palmer** (left) from Station Administrator **Warren Neu**, and Electronics Technican **David N. Bulk** (right) from Station Manager **Scroggs**.



Robert (Bob) L. Trammel recently came to Jamesburg from Brazil TT&C. Retired from the Army, **Bob** joined COMSAT in 1975. He was accompanied here by his wife **La Jean** and son, **Michael**. The Trammells have three married children, **Patricia, Craig** and **Carol.** —**C. B. Marshall**

LABS. **Krishna Virupaksha** of the Signal Processing Department and his wife **Bharathi** left last month for six weeks vacation in their homeland India. It should be an exciting trip since it's been eight years since they've seen their families and friends.

Kevin Hodson, one of our INTELSAT Nominees from the United Kingdom, is hoping the communications system doesn't break down between here and there—he's anxiously awaiting word on whether he's the father of a new son or daughter. **Allen Gatfield**, Manager of the Image Processing Department, attended a CCITT meeting in Geneva after which his wife **Barbara** joined him for a European vacation.

Debbie Moore, WP Operator, is leaving COMSAT Labs the end of December to study Business Management at Eastern Kentucky University. Congratulations to **Fred** and **Carol Rieger** on the arrival of their new son **Theodore Robert. Larry Sparrow** has been elected Northeastern Regional Director, 1978-1979, for the International Society for Hybrid Microelectronics. **Larry** also

William I. Fallon, Jr., Director, Laboratory Services, was recently elected Chairman of the Board of Directors of Montgomery General Hospital in Olney, Maryland. An employee of COMSAT since 1966, Bill resides with his family in Olney.

served as assistant general chairman for the 1977 ISHM International Symposium held in Baltimore, Maryland.

In sports, the COMSAT entry in the Gaithersburg co-ed volleyball league is tied for second place with a 10-5 record and with two weeks yet to go. New Labs employees include **William Bruce, Mark Redman, Paul Karmel, Valor Christiansen, Anita Goldstein** and **Herbart Moreno.** INTELSAT Nominee **Mr. Natarajan** has departed the Labs.

David Perlmutter has been designated Manager of Product Development, a new position established within Engineering Services. The purpose of the new position is the transferring of continually develop technologies at the Labs into commercial products. —**B.P.S.**

M & S CENTER. A luncheon was held recently at the Washingtonian for **Ramon Hasberger** who resigned from COMSAT to take a position with SBS in North Carolina. **Mike Roberts** spent three days at the Etam Earth Station during his semiannual maintenance of TTY machines. **Ken Remington** also visited Etam to gather information relative to GCE installation. **Bill Peck** spent some time at Andover for earth station familiarization and to acquire data.

The Calibration Team has completed trips to stations at Southbury, Andover, Mill Village, Etam and AT&T at Wheeling, West Virginia, after which the team departed for Nigeria for two weeks of calibration and training. Pat Ross completed a two-week training course on the computer conducted by Adage Corporation in Boston. **Don Rounsaville** attended a three-day seminar at NBS in Boulder, Colorado. **Bud Kennedy** visited Southbury to assist in and give training to station personnel on supply systems.

George Robertson instructed one of the two CPR training sessions given at Clarksburg. One of those completing the session was **Barbara Hutchens.** The September Safety Award

was won by **Chuck Jenkins** of the Material Section (photo below) for his suggestion on improved lighting in the warehouse.

Three M & S employees celebrated birthdays recently. Senior Clerk **Judy Ahalt** turned 18, and we don't count the years for **Jim Silvius** and **George Robertson.** Your correspondent supplied the cakes. **Robert Riblet,** Jr., son of **Chris** and **Bob Riblet**, has been promoted to Airman First Class in the Air Force and has an 18-month tour in Guam.

The M & S Center picnic was held at Banner Park, Sugar Loaf Mountain, with about 40 adults and children enjoying the food and games. Our vacationeers included: **Barbara** and **Hugh Hutchens**, tent camping at Kitty Hawk, North Carolina; **Betty Jo** and **Floyd Thompson**, fishing at Litchfield, South Carolina; **Betty** and **Terk Hall**, motoring to Ohio and West Virginia; and **Ann** and **Pierce Stine**, "motor homing" to Chincoteague, Virginia. **—Darleen Jones**

PAUMALU. Our CEA holiday get-together was enjoyed by about 50 employees and guests at the Sheraton-Waikiki early in December. Paumalu CEA President **Tom Akimoto**, with the assistance of **Gil Estores, Ron Miyasato, Al Prevo** and **Kent Hunter**, planned an outstanding seven-course Chinese dinner. Many lucky people left with prizes.

Operations Supervisor **Prevo**, at the conclusion of the Supervisors' Workshop at Headquarters, got together with ex-Paumaluan **Walt Gugler** (now at the Operations Center) and drove cross-country to the West Coast where **Al** was joined by his wife **Carol** and two children for a tour of the west coast.

Congratulations to Senior Technicians **Tim Kolb, Ron Miyasato, Paul Motoyama** and **Paul Koike** on their successful completion of courses in Principles of Management sponsored by the Hawaiian Educational Council. Certificates were awarded to both **Pauls** for completing part one of the series and to **Ron** for completing part two. **Tim** received his diploma for completion of all four parts of the management seminar.

Additional congratulations are in order for **Tim**. He and wife **Ruth** have a new son, **Matthew Lawrence**, who weighed in at eight pounds at birth. **—Bob Kumasaka**

PLAZA. **Bill Hamilton** recently arrived here from Jamesburg and is busy getting settled in his new home in Dale City, Virginia. Bill and his wife grew up in Alaska and spent seven years at the Andover, Maine, station before going to the Jamesburg station for four years. **Jo Roche** from the Philippines has joined Bob George's group in the Computer Room.

Peg Walker reports an enjoyable trip to Texas and Mexico, visiting her parents in El Paso and helping her mother celebrate her eighty-third birthday and her parents' sixty-third wedding anniversary. After a shopping trip in Juarez she flew to Houston for a week's visit with her daughter and grandchildren.

Wanda Mills has departed COMSAT to join the Office of Telecommunications, Department of Commerce. Congratulations to **Anna Felder Davis** on her recent marriage. Her husband David is an electrician at Howard University and both are native Washingtonians. Congratulations also to newlyweds **Linda Whetsell** and **Thomas Reed.** The ceremony was conducted in her home state of Ohio.

Congratulations are also in order for **Doreen Weeden,** formerly of Loveville, Maryland, and **Mark Woodland** recently married.

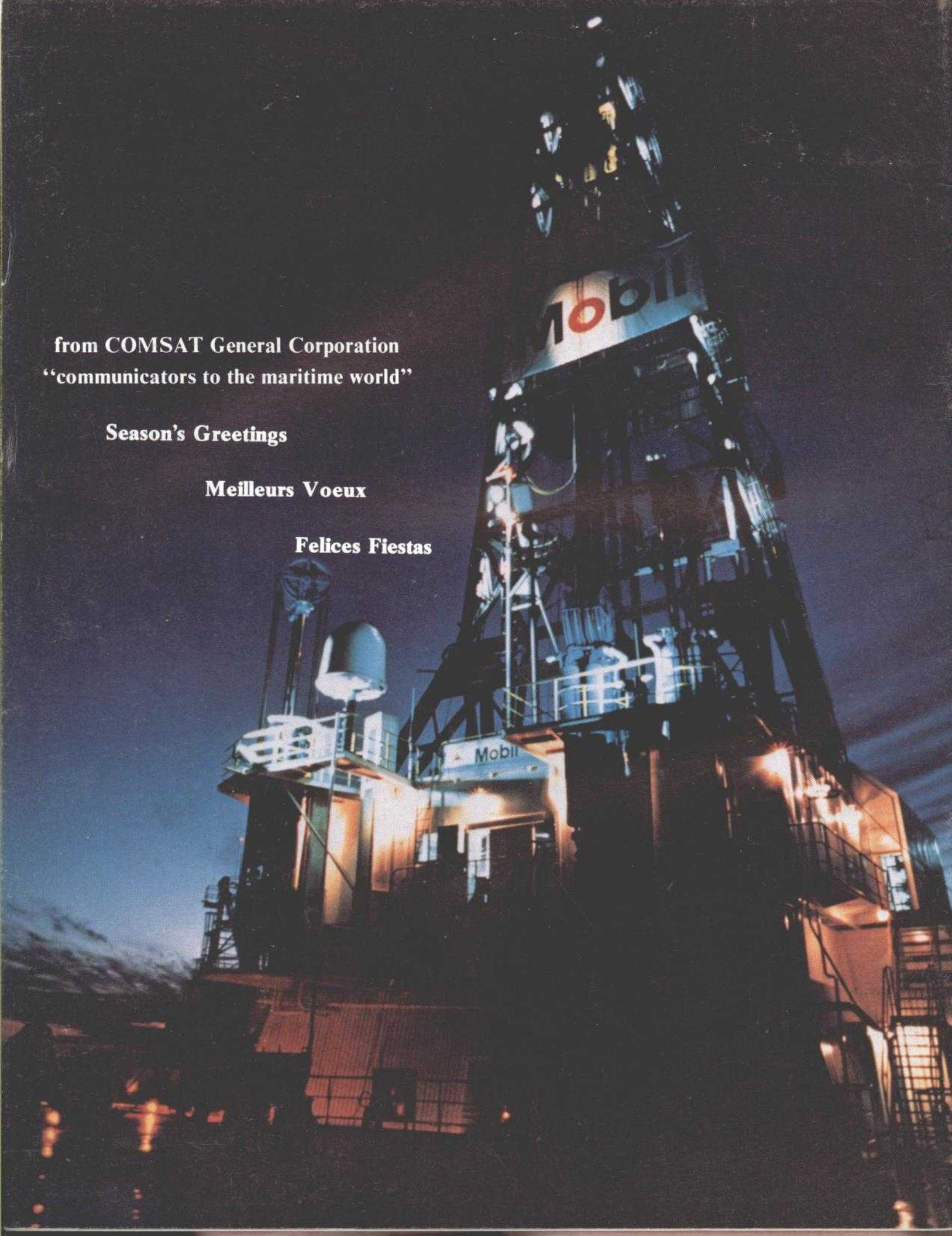
The Lunch Bunch which visits the Library daily during the noon hour appreciates the "new look" of the Library rearranged to present an even more attractive atmosphere and more usable space. **—Gloria Lipfert**

SOUTHBURY. Midshipmen of the Maritime Academy visited the station recently and displayed considerable interest in MARISAT operations. Attending special training classes were **Don Smith,** OSHA/Safety Seminar, Meriden, Connecticut; **Ronnie Hicks**, Codex training, Newton, Massachusetts; **Mike Masse,** Teletype training, Chicago, Illinois; and **Jim Nelson,** Air Conditioning training, Syracuse, New York.

The station staff expresses its appreciation to **Bruce Lyle** (husband of MARISAT Operator **Annabelle Lyle**) for voluntarily providing training in the use of the Scott Air Pack (self-contained breathing apparatus) and various types of fire extinguishers.

Mike and **Mona Masse** invited members of the staff and their spouses to a Halloween Party at their home. **Dolores** and **Paul Raneri** attended dressed as clowns, **Mike** and **Mona** posed as Wizards; **Connie Sarles** as Frankenstein's monster and **Cindy Bachyrycz** came as a pumpkin. **Barbara Coburn** came in gypsy costume, while Station Manager **Alan** came dressed as ????—having just completed a move he couldn't find any clothes that matched.

Early in November, Station Manager **Coburn,** MARISAT Operator **Bachyrycz** and Station Engineer **Don Smith** were guests of Captain H. C. Parker on board the Prudential Lines' Lash Turkiye in New York. All reported it a unique and impressive experience. **—Eileen Jacobsen**


from COMSAT General Corporation
"communicators to the maritime world"
Season's Greetings
Meilleurs Voeux
Felices Fiestas
Mobil
Mobil