COMSAT NEWS

February — March 1971

'Program for an advance for the people of the U.S.'

COMSAT Proposes New System for Many Users

In a March 1 filing with the Federal Communications Commission, COMSAT proposed a multipurpose domestic satellite system to provide a wide range of communication services to customers throughout the United States.

The system would employ three high-capacity satellites in synchronous orbits and an initial nationwide network of 132 earth stations—a system that would through modern space technology vastly expand and greatly diversify the nation's communications resources.

COMSAT made its proposal in a three-volume filing, buttressed by detailed technical and economic plans. The system ultimately could involve an investment cost of approximately $248 million.

(See COMSAT Offers Domestic System, Page 3)

Series IV Satellite Nears Position; Commercial Service To Begin Soon

The first satellite in the INTELSAT IV series, now nearing its intended position over the Atlantic Ocean, is being prepared to begin commercial service in the middle of March.

The satellite was successfully launched on January 25 after three postponements due to unfavorable wind conditions at high altitudes over Cape Kennedy.

In the first use of an Atlas Centaur on INTELSAT launch missions, the satellite was injected into a highly accurate transfer orbit. Telemetry data was satisfactory, and no spacecraft nutation was detectable.

The apogee motor was fired at the third apogee, with satisfactory results, and the satellite was injected into near-synchronous orbit with a westward drift of 3.5 degrees a day.

At its present drift rate, the satellite will arrive at its intended station (24.5 degrees west longitude) in early March The drift will be halted by firing hydrazine thrusters.

Communications Tests

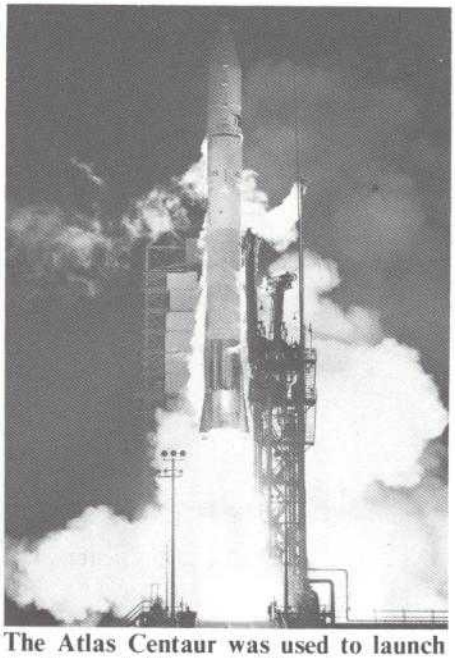
Communications tests began on February 7 when the satellite became visible to the Fucino, Italy, Earth Station, and were completed on February 19. The tests showed that the satellite's communications components and antennas were operating properly.

When traffic transfers are completed, the new satellite will be the primary operational satellite for the Atlantic region. A mass, simultaneous pointover of the earth station antennas in 14 countries now operating with the INTELSAT III, F-6, satellite is planned for mid-March. Before the pointover occurs, however, the frequencies and bandwidth being used by these earth stations will be changed to meet INTELSAT IV transmission parameters. The modifications will begin in early March.

The IV Series

Meanwhile fabrication of follow-on satellites in the IV series continues on schedule at Hughes Aircraft Company. The IV, F-1, remains in storage.

The current delivery schedule calls for delivery of the F-3 in March, with delivery of three further flight models later in 1971 and the final two early in 1972.



The Atlas Centaur was used to launch the first satellite in the IV series.

Net Income Rises To $1.75 a Share

COMSAT reported a net income for 1970 of $17,501,000, or $1.75 per share, up from $7,129,000, or .71 cents per share, for 1969.

Operating revenues for 1970 were $69,598,000, an increase of $22,564,000 (48 percent) over the $47,034,000 received in 1969.

Improvement in revenues resulted from an overall increase in use of the satellite system. At December 31, 1970, the equivalent of 2,139 full-time half-circuits were being leased to COMSAT customers, compared with 1,435 at the end of 1969, an increase of 704 (49.1 percent).

Operating expenses for 1970 amounted to $59,118,000, up from $45,202,000 for 1969. Depreciation and amortization expenses accounted for $19,968,000 of the 1970 total, compared with $17,481,000 for 1969.

Net operating income for 1970 totaled $10,480,000, compared with $1,832,000 for 1969.

Other income, consisting primarily of interest from temporary cash investments (net of Federal income taxes) and interest during construction, was $7,021,000, compared to $5,297,000 in 1969.

News at a Glance

On the Cover

Briefing reporters on COMSAT's multipurpose domestic system, Dr. Joseph V. Charyk outlined details of the proposal and answered questions.

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An artist's concept of COMSAT's proposed multipurpose satellite system for domestic services.

From Page 1

COMSAT Offers Domestic System To Serve Wide Variety of U.S. Users

In a press briefing held at COMSAT Headquarters, Dr. Joseph V. Charyk, President, told 24 members of the press that, "the benefits of satellite technology to a high degree have been brought to international communications. But as a recent Senate Commerce Committee report states, the people of the United States have been deprived of a domestic satellite system and its benefits."

Dr. Charyk noted that COMSAT recently filed with the FCC an application to provide satellite services to the American Telephone and Telegraph Company.

"Now," he said, "COMSAT asks authority to provide a nation-wide multipurpose system of communications services. COMSAT wants all prospective users to share the benefits."

The proposed multipurpose satellite system would be capable of handling all types of high-quality communications, including telephone, data services and TV programming. The Corporation emphasized that only a single multi-user system of high capacity such as it proposed—rather than a proliferation of separate systems—would result in proper conservation of limited frequency space and bring the full economies of scale to all users, large and small.

At the briefing, Dr. Charyk said the establishment of a single multipurpose, multi-user domestic satellite system, employing large satellites, to meet non-Bell System requirements, provides a great opportunity to do three things:

"(1) to provide the means for satellite communications to provide a true competitive alternative to existing terrestrial facilities,

"(2) to make the most efficient use of radio frequency spectrum and available orbital slots and, thereby

"(3) to provide to the people of the United States the economic benefits of the advanced satellite technology in the best way."

Following his half-hour statement, Dr. Charyk answered questions for 45 minutes. Attending the briefing were representatives of a number of major daily newspapers, news wires and trade press publications.

The COMSAT filing was in response to FCC guidelines issued last March 20 for parties wishing to apply

(See High Power Satellites, Page 19)

COMSAT Plans Use of Extensive Antenna Network

COMSAT's proposal for a multipurpose domestic system calls for an extensive initial ground network of 132 earth stations, including new stations in Alaska, Hawaii and Puerto Rico. COMSAT has submitted detailed construction applications for a first group of five station facilities, with other applications to be filed later.

This first group included stations embodying most of the essential technical characteristics for different types of stations that would be needed in the full system, thus giving the FCC the basic data to evaluate and compare COMSAT's plan with any alternatives.

The applications called for two major stations, one at Southbury, Connecticut, to serve the New York City area, and one near Santa Paula, California, to serve the Los Angeles area. Each station would be equipped with two (twin) 97-foot diameter antennas for sending and receiving communications; also one 42-foot antenna at each site primarily for tracking, telemetry and control (TT&C) duties associated with positioning and controlling the satellites in the system.

Also included were applications to construct three stations in Alaska. One receive-only 42-foot antenna for TV distribution would be located at COMSAT's present Bartlett earth station site near Talkeetna, about 90 miles northwest of Anchorage. Two send-and-receive stations with 32-foot antennas would be located at sites near Juneau and at Prudhoe Bay on the North Slope as the first steps toward providing both intrastate and interstate Alaska communications via satellite facilities.

The COMSAT system also would include 42-foot receive-only antennas for TV distribution to be located at sites of existing earth stations at Paumalu, Hawaii, and Cayey, Puerto Rico. Applications for these will be filed later, pending arrangements with other carrier companies who share ownership with COMSAT in the present sites.

COMSAT said that applications for the remaining 127 earth stations in the initial ground station network would be filed subsequently as discussions are concluded with major potential users for initial service, including the TV networks and large carrier companies.

Dr. Charyk presents Mrs. Irmgard Reiger with a plaque like those used to commemorate the Labs auditorium in honor of her late husband, Siegfried H. Reiger. Looking on is Peter Reiger.

At the Labs

Reiger Auditorium is Dedicated

In a simple ceremony at the end of January, the auditorium at COMSAT Laboratories was named Reiger Auditorium in memory of the late Siegfried H. Reiger, COMSAT's Vice President - Technical from the early days of the corporation until his death in 1970.

Mrs. Reiger and their son, Peter, were present for the ceremony.

Assistant Vice President W. L. Pritchard, Director of the Laboratories, welcomed several hundred employees and guests and gave a brief, moving tribute to the man whose technical judgment guided the establishment of the successful international satellite communications system and whose foresight led to the founding of COMSAT Laboratories. Mr. Pritchard said that Mr. Reiger was a man of vision and intellectual courage who had the very rare gift of distinguishing between crucial issues and those which eventually take care of themselves.

Dr. Joseph V. Charyk, President of COMSAT, then formally dedicated the auditorium by presenting a memorial plaque to Mrs. Reiger. In his remarks, Dr. Charyk expressed hope that the work begun by Siegfried Reiger would be pressed forward.

The Reiger Auditorium is fully equipped with modern audio-visual equipment and was designed for presentations to groups as small as a dozen or as large as several hundred. The capacity of the auditorium can be doubled, as it was during the dedication ceremony, by opening the folding wall between the rear of the auditorium and the cafeteria and utilizing cafeteria space and chairs.

COMSAT Scholarship

All employees who wish to enter their children in the 1972 COMSAT Scholarship Program must file a scholarship application by March 15, 1971. Children who were high school juniors in October 1970 and who took part in the NMSC testing at that time are eligible. Scholarship applications should be submitted to John Little, personnel.

Two Employees Gain Recognition From Navy Units

In two separate letters of commendation, Ethel J. Saltz, computer division, and Robert F. Hefele, communications processing lab, were honored by their commanding officers for work previously performed for the U.S. Navy.

For her services as a member of the Integrated Ship Design System (ISDS) Team, Mrs. Saltz received an Award of Merit for Group Achievement from Captain R. W. King (U.S.N.), Commanding Officer of the Naval Ship Research and Development Center, Washington, D. C.

The team that worked on the ISDS project completed a pilot model for a technical feasibility demonstration given in early 1970. The members of the group were recognized for their efficiency and teamwork in putting the pilot model together within a short time under difficult conditions.

Mr. Hefele was recognized for outstanding achievement and leadership in his reserve unit by the Commanding Officer of the Naval Reserve Security Group Division (5-14).

Mr. Hefele's unit entered competition based on overall unit performance, drill attendance and completion of two weeks' active duty for training. The unit won first place in the Fifth Naval District competition and second place in a field of 96 entries on the national level. The unit received a first-place trophy and plaque for the District victory and a letter of commendation from the Secretary of the Navy for its ranking in national competition.

The commanding officer of the unit, L. M. Deleon, cited Mr. Hefele's achievements in a letter to COMSAT President Joseph V. Charyk in which he stated that "the unit's progress and success could not have been possible without Mr. Hefele's dedicated cooperation and devotion to duty."

Glaucoma Clinic

A glaucoma clinic for Headquarters personnel will be held on March 16 in the fourth-floor auditorium. As a part of the one-day clinic, employees will receive information about glaucoma and have their eyes examined for the disease. Hazeline Durant, health unit nurse, plans to distribute details about the clinic.

Directors Elect John L. Martin, Jr., AVP for Domestic and Aeronautical

John L. Martin, Jr., has been elected as an Assistant Vice President for Domestic and Aeronautical Satellite Systems.

Mr. Martin retired as a Major General last year after nearly 30 years' service in the U.S. Air Force. He came to COMSAT a year ago as a Special Assistant to the President.

He was elected to his new position by action of the Corporation's Board of Directors. In his new position, Mr. Martin will continue to report directly to Dr. Joseph V. Charyk, President.

In announcing the Board's action, Dr. Charyk said that establishment of a project office for domestic and aeronautical satellite systems would provide a "corporate focal point for these important programs at an appropriate level in the Corporation."

COMSAT currently is extensively engaged in development of domestic satellite services and has proposed aeronautical services by satellite.

Mr. Martin holds a bachelor's degree from the Polytechnic Institute of Brooklyn, and a master's degree from the Massachusetts Institute of Technology. He is a life member of Tau Beta Pi, an honor engineering fraternity, and is an Associate Fellow of the American Institute of Aeronautics and Astronautics.

L.A. Personnel Escape Hazards Of Recent Quake

By Dee Wallace

The disastrous earthquake of February 8 took place about 27 miles north of Los Angeles, close enough to shake up the COMSAT West staff but far enough away to spare us any severe damage or injury.

Some residential areas were without electrical power and telephone service for several hours following the 6:00 a.m. earthquake, and swimming pools in the area lost as much as a couple feet of water.

Residents of the San Fernando Valley were evacuated from their homes when the Van Norman Reservoir threatened to break loose from its dam. The reservoir water has been pumped out to nearby streams, relieving some of the pressure from the weakened dam walls.

Most people at COMSAT West incurred some breakage to household items, but, in general, losses were slight.

INTELSAT IV PARTY

While the majority of the COMSAT West crew was at Cape Kennedy for the INTELSAT IV launch, several of the wives and employees enjoyed an evening at the Los Angeles Music Center. Ovid's *Metamorphoses* was performed at the Mark Taper Forum.

INTELSAT Satellites To Be Used For Testing Unmanned Earth Station

The National Science Foundation has consulted COMSAT regarding a proposal for the establishment of a small unmanned earth station in Antarctica to transmit scientific data via the INTELSAT system on an experimental basis.

The nonstandard station would be located near McMurdo Station. It would employ an 8-foot antenna and would send geophysical data via a Pacific INTELSAT satellite to the Jamesburg Earth Station. The data would be forwarded by landlines to Stanford University for analysis and use by scientists and researchers. The unmanned facility could serve as a prototype for a possible network of future stations capable of automatically collecting and transmitting data from remote areas of the subcontinent. Some 16 nations, including the U.S. and U.S.S.R., are signatories to the Antarctica Treaty under which such research programs are conducted.

COMSAT reviewed the request and made the necessary application to the ICSC on behalf of the National Science Foundation for access by an unmanned station to an INTELSAT satellite for one month on an experimental basis. The ICSC approved the project in January 1971.

Under the terms of approval, COMSAT as INTELSAT's Manager first will test the electronic equipment to be used in Antarctica through the experimental station located adjacent to its Headquarters building in Washington, D.C., in order to determine that the equipment will operate properly and pose no interference to INTELSAT service. The second phase consists of a one-month test of the unmanned station at its site in Antarctica. COMSAT also will seek FCC approval for operation of the experimental project.

At Andover

CEA Celebrates Its Annual Party

By Joanne Witas

The Mexican Chicken Coop was the local restaurant chosen by the Andover CEA members to serve the party of 70 persons who braved the snow and bad weather to make the annual dinner a successful one. The menu featured a main course of roast beef served with all the trimmings.

Andover received 666 envelopes from stamp collectors to commemorate the launch of Apollo 14 astronauts. Cachets of the Andover station were applied to each envelope before it was returned to the sender via the U.S. mail.

Nippon Electric Company of Japan sent its representative F. Kobayashi to Andover to install additional multiplex equipment.

Armin Friedli

Niklaus Bertschinger

John Rotteveel

Students Benefit From IAESTE Exchange Experiences

The IAESTE program is in its twenty-third year of shifting students from one country to another for the purpose of cultural and technological exchange. In recent years, the International Association of the Exchange of Students for Technical Experience (IAESTE) has grown to number almost 10,000 participants a year, while the number of countries participating has reached 43.

COMSAT is one of 106 American firms and universities taking part in the current program. Presently there are three IAESTE exchange personnel working at Headquarters. Each participant has completed a minimum of three years of college-level work in technical and allied fields, and each brings with him a certain interest in sharing technological knowledge among nations.

Armin Friedli

Armin Friedli came to the corporation in June of last year from Zurich, Switzerland, where he had completed his master's-level work at the *Eidgenossische Technische Hockschule* (ETH) in mathematics. For his traineeship, he has been working for Howard Prescott in the earth station implementation division.

Before coming to COMSAT, Mr. Friedli said he had particular interests in corporate operation, especially in the U.S. business structure, and the corporation's relationship to INTELSAT. He had expected to find work here fast-paced and was anxious to compare it to the European industrial structure.

But in reality Mr. Friedli found that work here isn't as rushed as he had first thought it might be. "Efficiency," he said, "seems to be the element that makes the American business operation work. I think that's good."

However, Mr. Friedli also expressed an appreciation for the casual, more personal atmosphere he has found in companies in and around Zurich. "We seem to know the people we work with better," he commented.

Mr. Friedli's assignment at COMSAT ends this June, and afterwards he hopes to spend more time touring the United States. He plans to return to Zurich and the ETH to take courses needed to complete his Ph. D. in math.

Niklaus Bertschinger

Also from the Zurich area and the ETH is Niklaus Bertschinger, who is currently with the systems engineering division. This is the electrical engineer's second stay in the U.S.; he was here for the first time for a year of high school study in New England.

Mr. Bertschinger's wife, Maria, is here with him. While here, she is polishing up her English for her job as a translator in Zurich.

Mr. Bertschinger is now working on the updating of the microwave data base, a computerized list of all microwave uses in the U.S. He thinks COMSAT's data base is the best one now available. He is also working on problems of frequency interference. In these areas, he has the chance to use his engineering background while doing some computer programming.

One of the Bertschingers' memorable experiences since coming here was being flooded out of their apartment in Arlandria. "The people's attitude toward the flooding was great," he commented, "and they seemed to take it all in stride. I guess they should, though, since it happens twice a year."

When Mr. Bertschinger's stay at COMSAT is completed, he and his wife plan to travel across the U. S. and then on to Japan and the Asian continent before returning to Zurich.

John Rotteveel

Working with Mr. Friedli in the earth station implementation division is John Rotteveel, who came to the corporation after completing his third year of electrical engineering studies

(See Student Exchange, Page 17)

Apollo 14 TV Is Seen Worldwide

"Right now I am sure this broadcast is going directly overseas to millions of people who are seeing it in their homes through satellite, and I think many people have said that this improvement in communications through the space satellite will certainly go a long way in solving the problems of the world, problems of understanding between peoples of different nations and different countries."

Astronaut Alan B. Shepard
From the Apollo 14 spacecraft
Sunday, Feb. 7, 1971

Some 24 different earth stations and four different INTELSAT satellites over three oceans were used in relaying live color telecasts of the Apollo 14 moon mission to a worldwide audience.

From lift-off on January 31 to splash-down in the South Pacific on February 9, broadcasters abroad leased a total of 95 hours and 24 minutes of satellite receive time for telecasts of the moon flight. NASA used another 12 hours and 48 minutes for reception via the INTELSAT satellite system of video pictures transmitted by the astronauts during certain periods of the actual walk on the lunar surface.

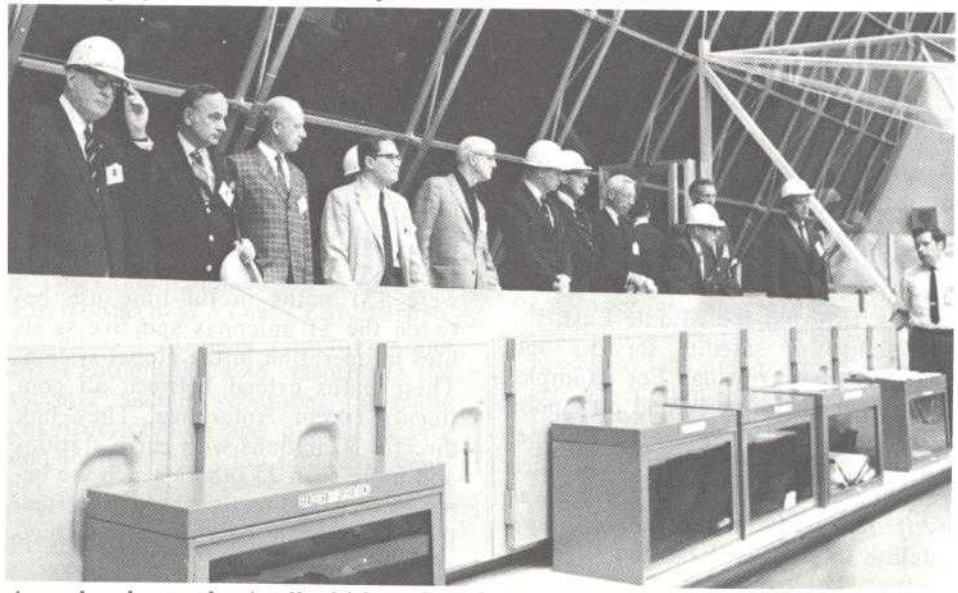
Thus, in all, including time used by broadcasters and NASA, a total of 108 hours and 12 minutes of receive time and 63 hours and 57 minutes of transmission time was leased on the INTELSAT system during the mission. This data is maintained by COMSAT's marketing department.

The total number of hours fell short of the more than 200 hours of satellite time utilized for the historic first Apollo 11 moon-landing flight in July 1969. But due largely to growth of the global system, more earth stations participated in the Apollo 14 flight (24) than did during the epic Apollo 11 mission, when 21 stations took part.

Four INTELSAT III series satellites were used to relay the Apollo 14 TV coverage—two over the Atlantic, one over the Pacific and one over the Indian Ocean. The earth stations involved in transmitting or receiving the broadcasts included six U.S. stations, six in Latin America, five in Europe, five in the Western Pacific and two stations in the Mideast. In addition, a small transportable station antenna was employed to transmit TV coverage of the splashdown from the deck of the recovery ship, the USS *New Orleans*.

NASA flight controllers in the Mission Control Center in Houston watch the Apollo 14 lunar exploration on their own screen brought to them in live television over the INTELSAT system.

Mary Stickland, wife of Aviation Week's Zack Strickland, looks over the COMSAT display in the Joint Industry Press Center in Houston.



A week prior to the Apollo 14 launch, COMSAT directors and officers received a briefing at the Apollo Mission Director Center, which adjoins the vehicle assembly building at Cape Kennedy. The purpose of their visit was to observe INTELSAT IV launch preparations.

Global Satellite Use Increases 52% in Past Year

Full-time commercial use of the global satellite system increased by approximately 52 percent in 1970, continuing a strong growth trend. The gains resulted from generally increased international communications volume, from increased numbers of earth stations in the global system which foster new demand for satellite service and from increased reliance on satellite services by large communications entities in the U.S. and abroad.

The growth in U.S. communications via satellite was approximately 55 percent in 1970. Use of the satellite system by all other nations continued its strong growth trend also, with a 49 percent gain.

Influencing Communications Growth

Satellite service had a positive effect on international communications volume in countries which formerly had access only to relatively poor international communications facilities. For example, after satellite services became available in Argentina, the volume of telephone and message traffic between that country and the United States approximately doubled, from an average of about 200 telephone and message calls a day in September 1969 to more than 400 a day in September 1970. In Brazil, communications with the United States increased by more than 100 percent in 1969, the first year of operation of its earth station, and increased by more than 50 percent in 1970.

Within Latin America

Communications within Latin America, between countries separated by such natural barriers as mountains and jungles, have also increased markedly with the introduction of satellite services.

In Africa and the Middle East, the availability of satellite services and usage is also growing. For example, Kenya, which formerly had only poor telecommunications links to Europe, was using a total of 24 full-time voice circuits at the end of 1970; Kuwait was using 18 circuits in the Indian Ocean satellite to the Far East and Western Europe. The completion of earth stations in such nations gives them, for the first time, direct, high-quality communications links, via satellite, with other nations having earth stations.

Don Chontos, left, who headed the Headquarters UGF drive, reviews the award plaques received at the UGF luncheon by John Hill, Corporate Relations, on behalf of COMSAT employees.

Corporation Receives UGF Awards

COMSAT employees have received two awards from the United Givers Fund for their participation in the fund drive conducted in the fall of 1970. The UGF supports over 60 charitable organizations in the greater Metropolitan area, for which it has collected $27 million in the past two years.

The Outstanding Community Service Award recognizes that at least 90 percent of the corporation's employees contributed to the UGF Fund, indicating a high level of civic participation. This honor was shared with 139 other companies and organizations that demonstrated similar civic interest.

The second award, the Three Year Yardstick Award, was received by the corporation for increasing its contribution by 50 percent within the three-year period 1967-1970.

These awards and others were presented by Joseph B. Danzansky, UGF General Chairman, to community participants at the annual UGF Dinner held at the Mayflower Hotel, Washington, D.C., on February 17.

Communications Paths

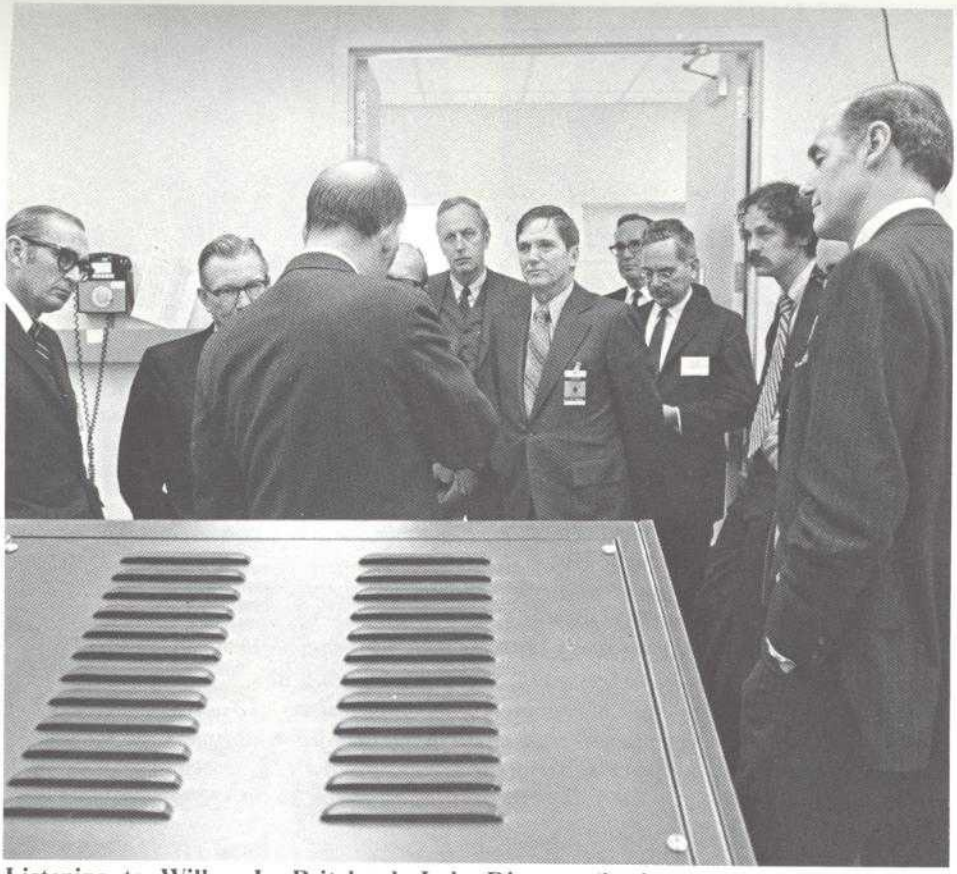
The number of communications paths or routes in the global satellite system is increasing significantly each year. In 1965, satellite service was available only between North America and Western Europe, and by only one satellite path at any given time. However, by the end of 1970, there were 131 paths in full-time use between the 51 antennas and five satellites in operation in the global system. These paths extend between all continents except Antarctica. They link directly 30 nations with earth stations and more than 25 others which are being served indirectly through terrestrial links with nearby nations having earth stations.

Full-Time Voice and Record Service

The predominant use of the satellite system, as of other international communications common carrier facilities, continued to be for voice and record circuits. Telephony alone accounted for approximately 79 percent of the utilization of the satellites and for a corresponding portion of satellite system revenues in 1970.

As of December 31, 1970, users were leasing full-time from INTELSAT for voice and record service the equivalent of 4,388 half-circuits, compared to 2,992 a year earlier. Of these, 2,762 were in the Atlantic region, 1,312 were in the Pacific region and 314 were in the Indian Ocean region.

COMSAT was leasing full-time to its customers on December 31, 1970, a total of 2,139 equivalent half-circuits, a gain of 704 during the year. This COMSAT utilization comprised 1,225 equivalent half-circuits in the Atlantic region, 790 in the Pacific region and 124.3 for Project Apollo communications.



Listening to Wilbur L. Pritchard, Labs Director (back to camera), are (left to right) FCC Chairman Dean Burch; Commissioners H. Rex Lee and Thomas Houser (partially hidden); Lucius D. Battle, Vice President-Corporate Relations; Commissioner Robert Wells; John Keyes, Labs planning and applications manager; Sidney Metzger, Assistant Vice President and Chief Engineer; Commissioners Nicholas Johnson and Robert E. Lee (partially hidden); and David C. Acheson, Vice President and General Counsel.

FCC Commissioners Visit Labs For Briefing on Research Activity

Chairman Dean Burch of the Federal Communications Commission and five of the Commissioners were given a tour of COMSAT Laboratories on Tuesday, January 19. Commissioners Thomas J. Houser, Nicholas Johnson, H. Rex Lee, Robert E. Lee and Robert Wells accompanied the Chairman.

Dr. Joseph V. Charyk, President, opened the Labs tour with introductory remarks. Wilbur L. Pritchard, Assistant Vice President and Director of COMSAT Laboratories, described the organization and mission of the Labs and conducted the party around the facility. At the close of the tour, the visitors attended a luncheon at the Laboratories.

Mr. Pritchard emphasized present research and development in digital television transmission and time-division signal processing. In the television and communications analysis branch, Mr. Pritchard demonstrated the effects of TV sampling and signal compression. In the switching and multiplexing techniques branch, he pointed out the terminal which participated in the field tests of the MAT-1 system in the Pacific area last summer.

The Commissioners showed considerable interest in apparatus that simulates the effects of fuel sloshing in a spinning satellite. Although the transparent fuel container spins quite rapidly, the sloshing effects of the fuel can be observed through a closed-circuit television hookup.

The Commissioners also toured the Environmental Test Laboratory, Chemical Processing Laboratory and the Photography Lab, inspecting the thermal vacuum chamber, anechoic chamber, etching and plating facility and the high-precision reduction camera.

In addition to Dr. Charyk and Mr. Pritchard, the guests were escorted by COMSAT Vice Presidents David C. Acheson, Lucius D. Battle and James J. McTernan, Jr., and Assistant Vice President and Chief Engineer Sidney Metzger.

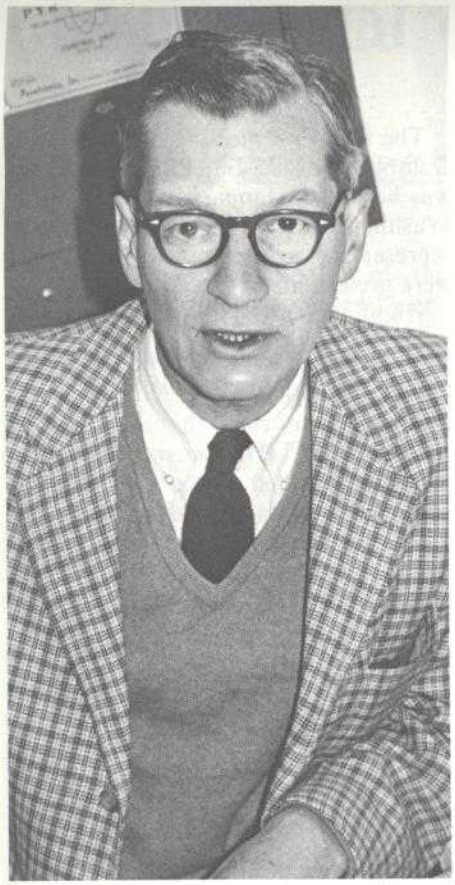
ICSC Actions

The fifty-first meeting of the Interim Communications Satellite Committee was held from January 13-20, 1971, in Washington, D.C. Eighteen members, representing a total of 49 signatories, were present at the meeting.

Highlights of the meeting were:

- Approval of the request of Mauritania for a quota of 0.05%.
- A decision that the cost of the INTELSAT III, F-8, satellite should be depreciated from the date of launch over a period of four and three-quarters years; that is, to the end of the accounting life of the INTELSAT III series.
- A decision to make new authorizations for the INTELSAT R&D program for 1971 of $2,290,000 for in-house expenditures and $2,215,000 for contract commitments, a total of $4,505,000.
- A decision to adopt a seven-year depreciation period for INTELSAT IV satellites and to depreciate the cost of a launch failure in the INTELSAT IV series over a seven-year period from the operational date of the next successful INTELSAT IV satellite.
- In response to the request of Dr. Santiago Astrain, Chairman of the Intersessional Working Group, the ICSC agreed to provide the Resumed INTELSAT Conference with a ten-year financial projection (1971-1980) indicating, on a year-by-year basis, estimated INTELSAT net capital contributions and outstanding contractual capital commitments, in order to assist the Conference in considering the question of a capital ceiling to be included in the new Operating Agreement. The combined total of net capital contributions plus outstanding contractual capital commitments was estimated to amount to as much as $507 million in 1975.
- A decision to approve the 1971 budget, after aligning it with the ten-year projection of INTELSAT expenses, by including in the 1971 budget $5 million for launch of the INTELSAT II, F-5, $2.5 million for modifications to the INTELSAT IV satellites, and about $500,000 for preliminary development work on INTELSAT V satellites.
- A decision that, retroactive to January 1, 1970, the entire amount of the 6% interest collected on late pay-

(See ICSC Actions, Page 12)



As supervisor of a wide variety of operations and maintenance functions, Clarence B. Crane, facilities branch manager, refers to his multitalented crew as the "F Troop".

Facilities Personnel

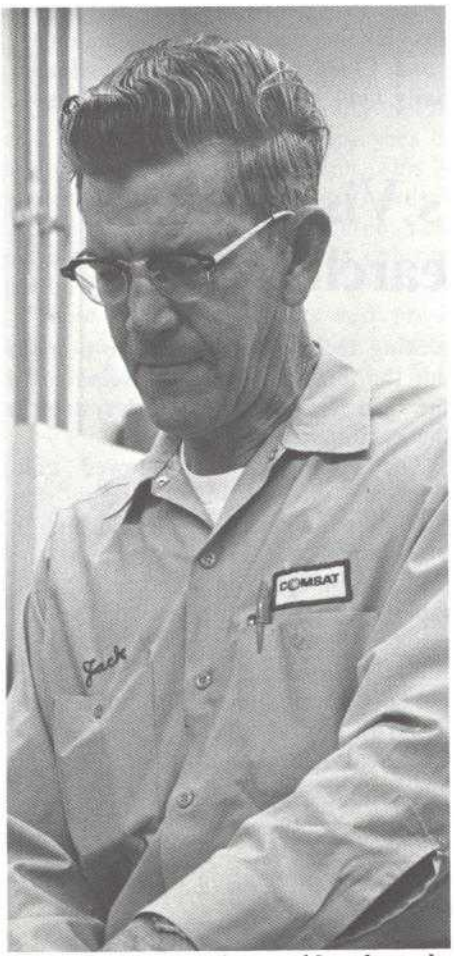
Housekeepers for the Labs

The Labs facilities branch, which is responsible for the general housekeeping duties performed at the Labs, includes under one roof several smaller shops with specific duties. The groundskeepers, electricians, carpenters, shippers and receivers, draftsmen and operating engineers work together to keep the Labs in good working form.

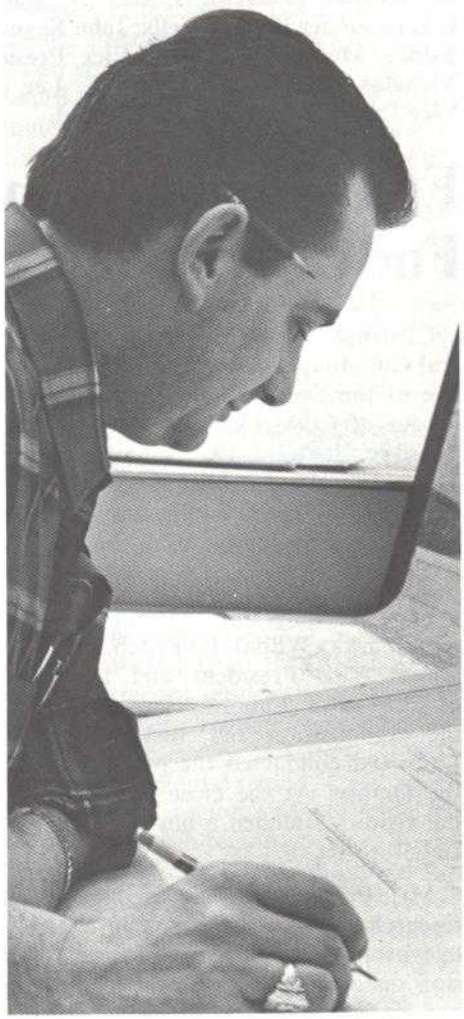
According to Clarence B. Crane, facilities branch manager, the function of the facilities division is to operate and maintain the Laboratories buildings, including any construction, expansion or revision.

Facilities personnel also provide service and assistance for the scientific portions of the Labs. This includes anything from supplying new electrical outlets to designing and building special cabinets for experiments. It sometimes means tackling the physical problems that arise in trying to maintain temperature-controlled rooms for housing experimental equipment, and also includes caring for the land surrounding the Labs. In short, the facilities branch personnel are COMSAT's "jacks-of-all-trades".

Ray Worthmiller, right, contract services supervisor, discusses schedules with Wackenhut Sergeant Al Gray, who oversees the 24-hour guard assignments.



Carpenter Jack Allison guides through a table saw the wood strips that will be used to finish the cabinet he is building. His duties include special construction projects needed by scientists for experimental projects.

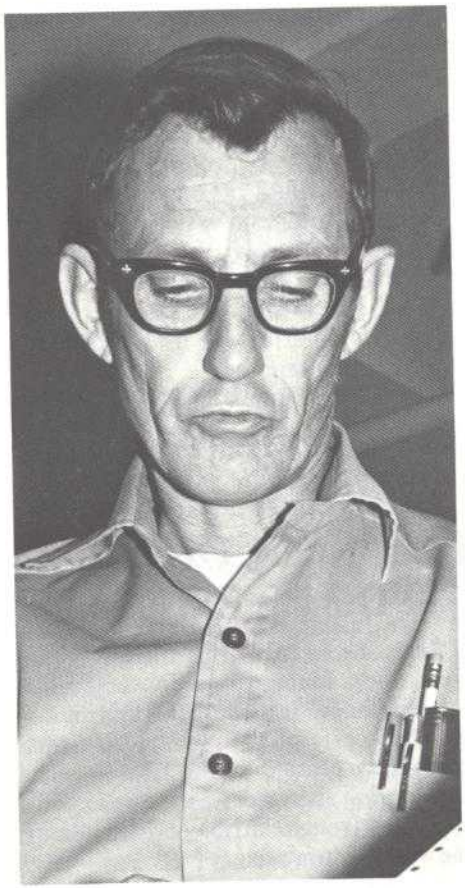


Frank Hess, architectural draftsman, prepares contract drawings for building and ground improvements.

Mrs. Elsie Price is the office secretary.

Operating engineers regulate the mechanical systems such as the air-flow, drainage, heating and air-conditioning units. Gideon Doolin, left, and Arthur Myers check the pressure in the chilled water system, which circulates the water into an air chamber that in turn cools the air.

Shipping-and-receiving crew members often handle large deliveries with a forklift, driven here by George Hewlin, who discusses delivery orders with John Becker while Steve Motosicky adjusts the payload. Another member of the crew, Fred Seaman, was not available for the picture.



Electrical operations are handled by engineer F. X. Coffey, who oversees the power system which feeds the 17,800 fluorescent tubes that light the Labs as well as the numerous power inputs needed for the computer and experimental purposes. Another engineer, Lee Nusbaum, shares these duties.

Groundskeepers Larry Pearre, left, and Howard Haines hook attachments to the tractor in preparation for the spring grounds care. The men are in charge of the landscaping and care of the 210 acres surrounding the Labs.

Checking the plans for the Labs public health programs are Mrs. Betty Mowen, R.N., and Dr. Healy, who acts as an advisor to the Health Unit.

Labs Health Unit Offers Plans For Extensive Services in 1971

The Labs medical health programs for 1971 are off to a good start, according to the Labs health unit nurse, Mrs. Betty Mowen. Plans for the year include the regular medical programs, such as the blood drive conducted on Friday, February 5, continued review for the first aid volunteers and the special programs run each month in addition to the basic health unit care.

Included in the regular health programs are first aid treatment, a program to provide safety glasses, laser eye exams and pre-employment exams. Also included are immunization clinics, safety committee counseling and the workmen's compensation program.

In addition to Mrs. Mowen's services, the Labs personnel are also served by a team of six first aid volunteers who are certified to administer first aid in emergency cases. Three of the six volunteers are also qualified to instruct first aid courses, which they will be conducting for employees during the coming year.

Special programs include diet clubs for employees wishing to gain or lose weight. For its current program, the health unit is conducting sensible exercise classes in 15-minute sessions three times a week.

Mrs. Mowen feels that one of the most important functions is the one-to-one counseling she is able to provide the Labs personnel.

"Many people come in with special problems or questions about operations and illness," she said, "and it gives me a chance to explain medical subjects in lay terms. It also gives the employee a chance to learn about medical care through a relatively effortless educational program."

Classified Ads

WANTED: 3 pairs ice skates (men's sizes); 1 pair rink roller skates. Contact: Jim Shreve - Room 5045, Ext. 6544.

From Page 9

ICSC Actions

ments of contributions by individual signatories should be allocated to COMSAT.

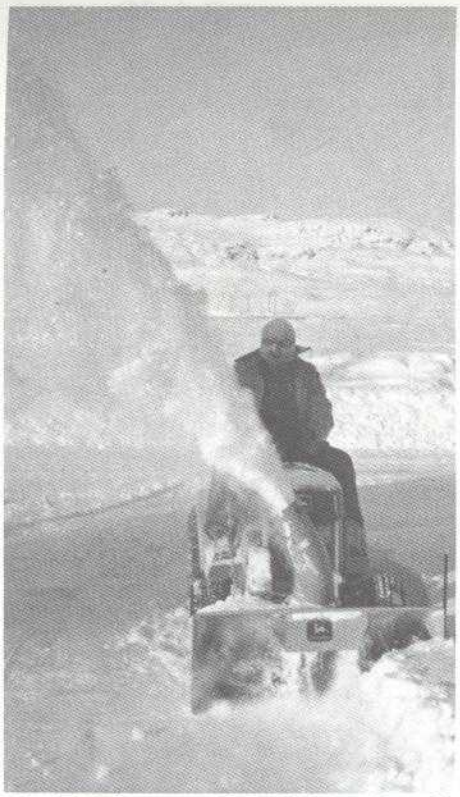
- A decision, pursuant to Article VI (b) of the Interim Agreements, that additional contributions of up to $100 million will be required during the projected interim period.
- A decision to authorize the Manager to negotiate a contract with S.I.T. Siemens in the amount of approximately $125,000 for the development of digital speech interpolation equipment.
- Approval of the nonstandard earth station proposed by the National Science Foundation to be used in an Antarctic geophysical experiment for access on an experimental basis to the Pacific INTELSAT III or IV. The experiment was approved for a one-month period.
- A decision to authorize the installation of active jet nutation dampers at no cost to INTELSAT for the INTELSAT IV, F-3 through F-8, spacecraft.
- A decision to ask the ICSC/T to investigate carefully, and as soon as possible, alternative methods of proceeding with the development of the INTELSAT V program, including the possibility of an experimental satellite program as envisaged by the Manager.
- A decision that either the INTELSAT III, F-6 or F-7 satellite would be available for use as a global replacement satellite.

The next regular meeting will be held March 17-24.

Ham Radio Operators Aid During Earthquake

Perry Klein sat in his office on the sixth floor, tuning in on conversations between hams in California and hams in other parts of the country. He was contacting persons in the Los Angeles area during the recent earthquake with messages from relatives and friends in the Washington area.

Dr. Klein was one of the six ham operators who relayed almost 1,000 messages telephoned into the Georgetown University station, WGTB, by concerned persons. Ham operators and WGTB announcers worked through the night following the earthquake and into the next day to get the messages through.



Jim Erskine gets all decked out in cold weather gear to clear away the snow.

Elaine Erskine's figurines are popular with station personnel.

From Brewster

Hobbies Pick Up In Midwinter Lull

This month the Jim Erskine family makes the headlines at Brewster. Elaine Erskine is a talented artist who has been producing decorative figurines. Several of them were recently on display at the station.

Elaine's husband, Jim, facilities engineer, has had his hands full trying to keep the station clear from snow. Besides washing down the snow from the antenna, keeping the roads and sidewalks clear is proving to be a full-time task.

New BCEA Chairman

Jack Wohlford has been appointed the new Brewster CEA chairman for the coming year.

Recreation

Skiing and snowmobiling are at a peak in the great Northwest, and many of the Brewster families are enjoying the big outdoors. Stu Miller did a great job handling arrangements for a gathering of outdoor enthusiasts held on January 31.

Even though we like all the snow, the wildlife is having a difficult time surviving. Many of the employees have obtained feed from wildlife officials to help the chukars, pheasants and quail get through the winter.

Jim Silvus, right, presents Rupe Hobbs with the Drazah Ytefas award for leaving the paper-cutter blade in a vertical position. The award, a coconut monkey, is given to persons caught violating safety practices.

From Etam

New Council Will Head ECEA; Activity Schedule Set for Year

By Deloris Goodwin

Spencer Everly has been appointed to serve as chairman of the Etam COMSAT Employees Association for 1971. Members on the council include Darrell Riddle, Bill Mayes, Don Gaston and Beverly Budd. Activities planned for the new year consist of a picnic, an "employees only" party, a children's Christmas party and an employees' Christmas party.

Etam's Budding Flying Club

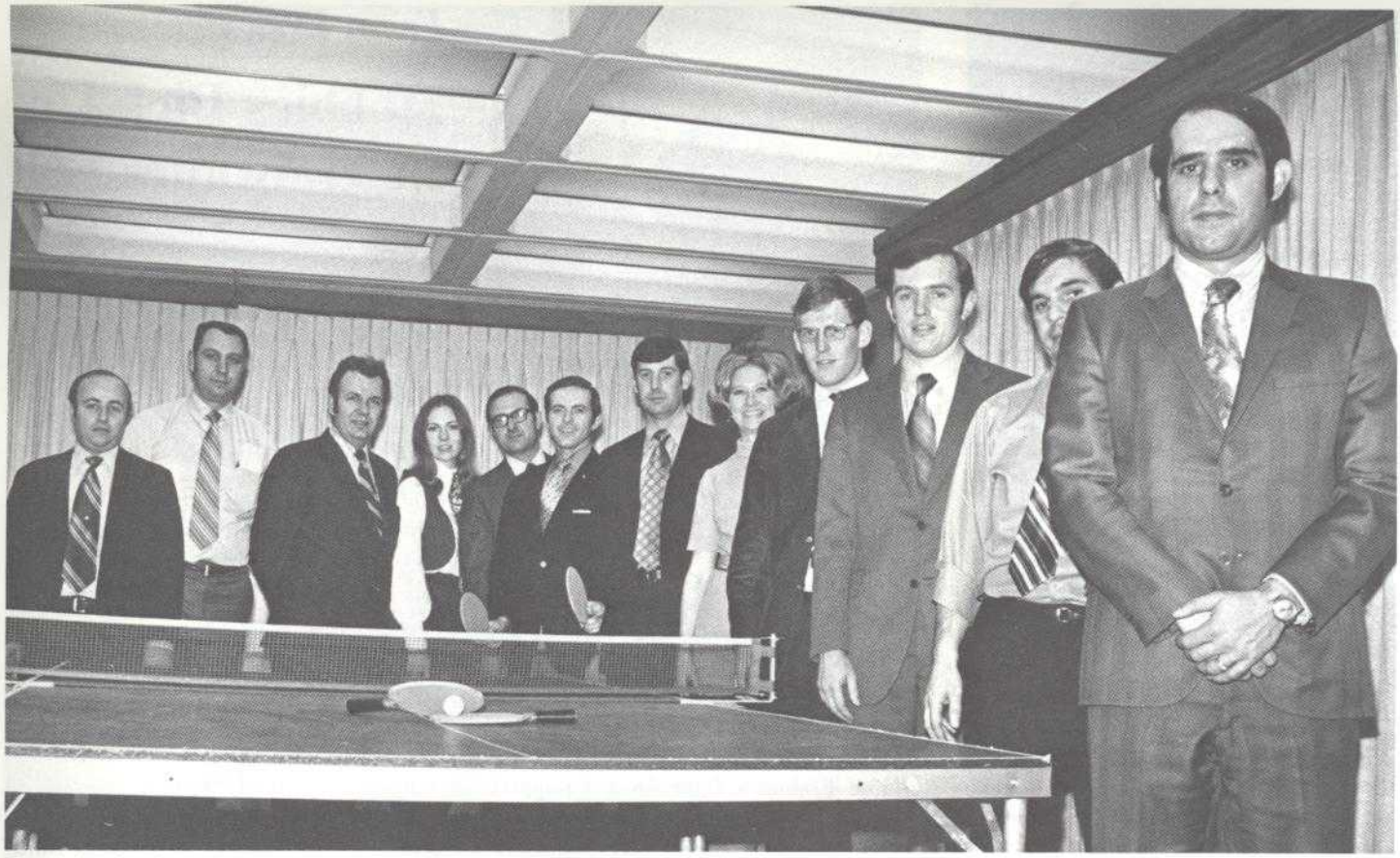
Members of the red operations team, James Evans, operations supervisor, and Spencer Everly and Darrell Riddle, senior technicians, have aspirations of becoming the "Red Barons" of Etam since all three are currently taking flying lessons. It has been suggested that the employees chip in to buy them leather helmets, goggles and scarves, so they will be appropriately dressed. William Carroll, station manager, and Sam St. Clair, senior technician, are already licensed pilots.

Roger Parsons, station engineer, and Gerald Reeves, senior technician, visited Headquarters in early February to attend the INTELSAT IV, F-2, transition meeting.

Proficiency Training Program

A proficiency training program is under way at Etam. Tentatively, training will commence after transition to INTELSAT IV, F-2. Each of the operations supervisors will be given a primary area for training, such as GCE, MUX and Antenna. Approximately one week will be used for preparing the material to be presented and then a month will be spent with each operations team disseminating the information. This is a long-range training program designed to keep the proficiency of our operations technicians at a high level.

Refresher demonstrations on the resuscitator and fire extinguishers were recently given for operations, facilities and maintenance technicians.



Participating in the Headquarters Ping-pong tournament were (left to right) Nate Tonelson, Al Yenyo, John Maddox, Ruth Peed, George Skinner, Randy Williams and Roman Rollins (doubles champions), Kitty Stephenson, John Rotteveel, Bill Simms, John DeCaro and Marty Levine. Hasin Hasmi and Tom Kelly (not pictured) also took part.

CEA Headliners

Club Activities and Special Events in Full Swing

By Beverly Nitkowski

The COMSAT amateur radio club recently participated in the Annual VHF Radio Contest. The object of this contest was to talk to as many stations as possible on the "very high frequency amateur bands". After a solid week of getting the equipment ready, the Telstar command transmitter inherited by the club malfunctioned. The transmitter was working on the 144 MHz amateur band prior to its untimely demise.

In spite of problems that arose immediately preceding the contest, 61 stations throughout six states were contacted, and the score was quite respectable. Cal Cotner subsequently advised that the transmitter is now alive and well.

Second Amateur Satellite

The amateur radio club members, together with members of clubs in Australia, Germany and Texas, are presently engaged in building the second amateur satellite.

Radio club members have been in contact with the Jet Propulsion Lab in California and the American Radio Relay League (WLAW). Other clubs helping on the project are the Cape Kennedy, Goddard, IBM and ARINC amateur radio clubs.

Astronomy Enthusiasts See Apollo 14 Dump, Eclipse of the Moon

Members of the astronomy club are busy these days with the many interesting sights of the winter skies. Vic Slabinski, an active member of the club, observed a dump from the spaceship while tracking the Apollo 14. He said he could not identify exactly what he saw, but that it appeared to be a cloud. When any type of liquid is dumped from a spacecraft, he said, the liquid vaporizes and reflects sunlight and appears to us as a cloud.

Another event that was not missed by astronomy club members was the eclipse of the moon, which began February 10 at 12:52 a.m. EST and ended at 4:37 a.m. Totality occurred between 2:00 a.m. and 3:25 a.m.

Members of the club are continuing work on making occultations of the stars. Peter Hartwell is building his own telescope. New members are always welcome. Contact Vic Slabinski, Ext. 6328 or Bill Young, Ext. 6792.

At present, Labs members are involved in the joint construction of a simplified walkie-talkie. Radio club members would like to get other clubs interested in this area.

For information, contact Mr. Maillet, president, on Ext. 4259.

United Buying Service

United Buying Service is your key to great discounts on cars, furs, furniture, carpeting and appliances. Call 657-1920.

More CEA Events

Homeowner Club Revival Planned

This year, CEA is trying to bring back one of its original clubs which lost ground for a couple of years—the homeowner's club. This club can provide a great service to the majority of CEA members, whether they are homeowners or apartment dwellers. Club members have guaranteed that women will not be forgotten.

At their first meeting, an interim committee was set up under the direction of Chairman Jack Phiel. Committee members are working on the possibilities of discounts on lumber and building supplies; group rental of large tools such as chainsaws, paint sprayers and Rototillers; monthly speakers, and interior decorating ideas.

If you would like to get in on this great opportunity to save some money, contact Jack Phiel. New members and new ideas are welcome.

Boating Club

An informal organizational meeting was held recently to begin plans for incorporation and purchase of a new boat. CEA has allocated seed money to help cover expenses, but Lou Early, club president, said that it is his hope and the hope of other club members that new interest will arise to help in purchasing a boat. A small membership fee will be charged which will actually be an investment share in the boat. When a boat is purchased, it will be made available to all members at a slight fee.

Mr. Early said that the club has obtained a slip at the Washington Sailing Marina where the boat may be docked. The sailing vessel will be ready for the spring sailing season.

Table Tennis Anyone?

The table tennis clubs, both at the Labs and Plaza, are going strong. Winners of the doubles tournament held at the Plaza were Roman Rollins and Randy Williams in first place and George Skinner and Tom Kelly in second. Winners of this tournament will play the winners of the Labs Tournament that was held in the fall.

The singles tournament is now under way at the Plaza.

Flying Club

Interested in learning to fly? Contact Charlie Heise, instructor and club president, for information.

COMSAT's girls' basketball team (wearing red) means business when it gets out on the court. The team played in the District Recreation League.

Athletics

Since softball season is just around the corner, it is time to organize teams at the Plaza and Labs. Interested players should contact CEA's athletics director Jack Dicks, Ext. 6864. Interested women players should contact Bev Nitkowski, Ext. 6141.

It is hoped that enough interest will be shown to enable the organization of a men's and women's team at both locations. Coaches are needed for all teams.

The Labs' volleyball team is upholding the old tradition of the Labs in its struggle for supremacy in the athletics field—they've won a few matches and lost many.

The girls' basketball team—"The Long Shots"—is continuing to pursue a victory. So far they have won two games, both by forfeit. However, defeat has not brought the spirits down. Instead, the girls continue to play and feel that they have more fun every time.

Membership Drive

The CEA is in the midst of another membership campaign. Bert Runfola, membership chairman, is busy collecting money and passing out membership cards. Since only CEA members can participate in CEA-sponsored events, it would be an advantage to join. You won't want to miss out on the many events that CEA is planning for the year.

Mardi Gras Dance

This year, CEA's social calendar began early. A Mardi Gras Dance featuring "The Personalities," popular rock band, was held February 27 at the Knights of Columbus Hall, Forestville, Maryland, from 9 p.m. to 1 a.m.

The party was BYOB (setups furnished), free beer, chips and pretzels. Door prizes and prizes for costumes were awarded by "Miss CEA 1971", Sandy Brown, of COMSAT Labs.

Photography Club Affiliates

Alan Coburn, club president, advises that the COMSAT photography club has recently affiliated itself with the Photographic Society of America (PSA) and the Greater Washington Council of Camera Clubs (GWCCC). Affiliation with the PSA and the GWCCC will give the club access to a variety of photographic activities, exhibitions, competitions and workshops on both the national and local levels.

Discussions have been held with the officers of the BELLCOMM camera club with a view toward possible joint meetings and competitions.

Arrangements have also been made with Eastman-Kodak Company to obtain a number of interesting slide and tape presentations on various

(See CEA Stays Active, Page 16)

Bartlett's Dewey Clay claims the "Great White Hunter" title with the deer he brought home from his hunting trip.

From Bartlett

Alaskans Receive Initial Live TV

By Jim Shaff and Larry McKenna

Alaska finally received its first live commercial television from the lower 48. Both the NFL playoff and the Super Bowl were broadcast live via the Bartlett station. It was a momentous occasion for old-time Alaskans who have not been accustomed to such service.

Since the recent heavy snowfalls, one of the biggest problems around here seems to be moose. It appears that the moose find the plowed roads a nice haven from the deep forest snows. However, they are not too anxious to share their haven with automobiles. Bullwinkle may be friendly, but not when he is challenging you for the road and you're in a VW Bug.

Snow Machines—Fun for Some

Snow machines are big business in Talkeetna, and many of the COMSAT families own these magnificent toys. The men find them exciting and a world of fun. The women, on the other hand, sometimes take an entirely different attitude.

Carolyn Patterson relates that her first experience on one of these machines was so harrowing that she is somewhat reluctant to try again. It seems that it was dark, the headlights for the machine were not working and Bill, her husband, was driving. Her total experience consisted of holding on to Bill with one arm, holding the flashlight over his head with the other and screaming, "Slow down!"

Bartlett Grows

Fred Herron joined the Bartlett team last December, bringing the station force to 10 technicians. Fred, his wife, Sally, and their two children came to Bartlett from King Salmon, Alaska. They are getting settled into their new home in Bartlett Park.

Personality Spotlight

Born in 1937 in Elma, Washington, George Arvid Furford spent most of his younger years in the western part of the state. After finishing high school and two years of college, he enlisted in the Navy for four years, during which time he was stationed in Germany and then in Turkey.

George's Alaskan adventures began less than a year after leaving the Navy, when, after only a week of marriage, he and his wife set out for Clear, Alaska, where he had accepted a job with the Ballistic Missile Early Warning System (BMEWS) project. The Furfords stayed there for six and a half years, suffering through some of the coldest weather imaginable. Temperatures of 60° below zero were common and minus 80° was talked about.

Last May, George and his wife, Gail, and their three children, Barbara, David and Sharon, left Alaska's interior and moved to the banana belt surrounding the Bartlett Earth Station. During the summer they lived in their 16-foot camper and last fall moved into a permanent home built by COMSAT.

The Furfords love Alaskan life and especially living in Talkeetna, where the climate is much milder and there is more time for them to do things as a family.

George says, "While we have moved closer to civilization, the virgin surroundings here are a source of enjoyment to all of us. For example, yesterday we were able to watch a small bull moose feeding in our backyard."

From Page 15

CEA Stays Active

aspects of black-and-white and color photography. The dates for presentation of these programs will be given wide publicity and all COMSAT employees will be welcome to attend and improve their photographic skills.

The club, presently 18 strong, is looking forward to an interesting season of photographic activities and welcomes new members. Anyone interested in joining should contact either the club secretary, Linda Kortbawi, Ext. 6759, or the club president, Alan Coburn, Ext. 6772.

Special for Card Fans

Do you enjoy playing bridge, hearts, whiz, rook or some other new and interesting card game and cannot find others who share your enthusiasm in the game? CEA would like to provide a means through which you can get together with various people and enjoy a good game of cards. Interested? Call Harriet Biddle, Ext. 6071.

Chess Club Elects Officers

The COMSAT chess club has elected Jim Shreve its chairman and Jerry Bidlack its activities director for 1971. The club plans a spring tournament in April for all interested Plaza employees. Meantime, skittles games are played daily in the Employees' Lounge at lunchtime. Kibitzers and challengers are invited.

From Jamesburg

Cachagua Valley Residents Defeat Proposal to Build High Power Dam

By M. Lee Dorsey

At a meeting held in late January, W. J. Hays, president of the California-American Water Company, announced that the new power dam would be built in San Clemente, leaving the residents of Cachagua Valley free from construction disturbances. Most residents, including several Jamesburg station personnel, were relieved by the announcement.

A year ago the California-American Water Company announced that preliminary engineering studies indicated that the site near the Jamesburg station in Cachagua Valley was the most favorable of five sites investigated for the proposed power dam. When the residents of the area heard the news, they formed a citizens' council to block the action.

Subsequently, protest letters were sent to the state representative, and money was raised to cover the court costs if legal action became necessary. One local artist, Jack Swanson, donated a painting valued at $2,500 to be auctioned off to help defray expenses incurred by the citizens' group.

The residents' efforts were rewarded by the company's decision to build the proposed dam at San Clemente. The Jamesburg station won't have a lakefront property after all, but nobody really seems to mind.

Microwave Installation

The County Planning Commission has approved the new alternate microwave route proposed by AT&T. For this new link, two 10-foot dish antennas will be mounted on the side of the Jamesburg building and a 10- by 16-foot passive reflector will be erected on the hillside across the valley.

Apollo 14 Coverage

The Jamesburg technical staff started tests for the Apollo 14 TV coverage early in January and continued tests throughout the month. A. Trey and E. Davis, General Electric personnel, were at the station to discuss test times and details for the mission.

Several tests were conducted with the GE transportable antenna aboard the USS *New Orleans* in order to perfect the reception of the splash-down events.

Jamesburg received more than 400 envelopes on which to apply the station cachet the day of the Apollo 14 lift-off. The local postmaster agreed to stamp all the envelopes with the lift-off date, January 31.

Potpourri

Roy Scheiter, facilities mechanic, was promoted to senior facilities mechanic on January 4.

Dr. N. Renzetti of the Jet Propulsion Laboratory and members of the NASA Tracking Panel were given a briefing and tour of the Jamesburg facilities by John Scroggs, station manager, and Michael Downey, assistant station manager.

From Page 6

Student Exchange

at the University of Delft in the Netherlands. Like Mr. Friedli, Mr. Rotteveel would also like to gain more experience in computer programming.

When he first arrived in September of last year, Mr. Rotteveel lived with a family in Vienna, Va., that was participating in the Experiment in International Living, a program matching foreigners with resident families with the hope of encouraging cultural exchange in natural surroundings.

Motivated to take part in the IAESTE program through his interest in computers, Mr. Rotteveel admits he opted to come to the U. S. because he thought this country would have the most advanced systems. Also, the program provides him with a chance to gain experience outside his own country. This is important, he feels, because Holland, being a small country, has limited opportunities in his area of interest.

Since his arrival, Mr. Rotteveel has had a chance to visit many areas along the eastern shore from New York to Miami. Before returning to his studies at Delft, he would like to tour more of the U. S.

Ali-Frazier Bout Generates Heavy Satellite Demand

The championship fight between Clay and Frazier in early March will be one of the most widely televised sporting events in the history of satellite communications. More than 14 earth stations are expected to receive TV coverage of the fight with three U.S. earth stations transmitting the bout to INTELSAT III satellites. Countries scheduled to receive the fight include Thailand, Korea, Japan, Chile, Colombia, Venezuela, England, Puerto Rico, Peru, Mexico, Panama, the Philippines and Hawaii.

Satellite television use increased by 601 half-channel hours during 1970, due in part to ten new earth station antennas operating in nine foreign countries and Alaska.

TV transmissions by satellite are often related to news and sports events, such as the 1970 World Cup Soccer matches, which generated more than 490 half-channel hours of traffic. A record number of 19 earth stations around the globe received and/or transmitted the championship match between Brazil and Italy.

Other widely telecast events last year were President Nixon's visit to Europe, Prime Minister Wilson's visit to the U.S., the funerals of Egyptian President Nasser and former French President De Gaulle, Pope Paul VI's visit to the Far East and Apollo 13 missions.

More international television is expected in 1971. Already this year Apollo 14 generated more than 100 hours.

In the early days of the satellite, system almost all satellite TV originated or terminated in the U.S. Due to the growth and flexibility of the system over 34 percent of satellite TV now is non-U.S. traffic.

Worldwide television traffic will continue to increase as new earth stations come into operation. By the end of 1974, an estimated 91 commercial antennas will be operating with the global satellite system.

Earth Station Developments

A new earth station at Arvi, India, near Bombay, went into operation via the Indian Ocean satellite on February 21. This increases the number of earth

The Fourier Series

Fourier — Baron, Prefect, Companion To an Emperor, a Tailor's Orphan

It seems impossible to talk for very long about radio theory with electrical engineers before hearing the name Fourier*. The Fourier series has become one of the prime mathematical tools for the analysis of radio waves. Yet many who know his name and his discoveries know little about the fascinating man himself.

Fourier was one of those geniuses who appear in times of great upheaval and make one wonder whether it's the genes or the times that produce him.

Baron Jean Baptiste Joseph Fourier was born the son of a tailor in Auxerre, France, in 1768, a year before Napoleon Bonaparte was born obscurely on the island of Corsica. The young Fourier was known to his neighbors as a bright but sober little boy. Suddenly, at the age of eight, he was orphaned. A friend recommended him to the care of the Bishop of Auxerre. Jean Baptiste became a ward of the Benedictine order, which conducted a military college in the vicinity.

At the Benedictine school, the boy's outward personality began to change. His brightness became brilliance. His soberness became ebullience. The story goes that by the age of 12 he was writing sermons for some of the lazier members of the Paris clergy. He grew into a know-it-all, and he remained one — sometimes charming, sometimes a terrible bore — for the rest of his life.

The Revolution Begins

In 1789 the 21-year-old Fourier was swept up into the whirlwind of the French Revolution.

His studies in mathematics had absorbed more and more of his attention (although he read voraciously and had become a walking encyclopedia). Because his undistinguished birth precluded a commission in the artillery, the direction in which his studies at the military academy were leading, he had entered the novitiate for the priesthood.

After the civil explosion in Paris in July 1789, Fourier recognized that he could never become a priest. He left the seminary and returned to the school at Auxerre, this time as a lay instructor in mathematics. At the same time he became more deeply involved in revolutionary politics.

*Pronounced Foor-yay.

As the Revolution disintegrated into the Terror, the irrepressible Fourier spoke out loudly but ineffectively against the senseless slaughter under the guillotine for all who dared express an independent thought. One wonders how Fourier himself escaped this triumph of brutality; perhaps he was regarded as a curiosity, or perhaps he was next on the list. No one knows. But he survived long enough to be saved to history (and to mathematics) by the coming to political power of Napoleon.

In the Emperor's Stable

Bonaparte was faced with a decimated France. Not only her aristocracy but her men of education and ability had been senselessly destroyed.

To help rebuild a viable society, he established first an Ecole Normale and then an Ecole Polytechnique as centers for training the country's future leaders. As a reward for his political activities in Auxerre, Fourier was invited in 1794 to accept a post in mathematics. He was a learned, witty, effervescent lecturer.

In 1798, Napoleon carried out a long-standing plan to "civilize" Egypt. Impressed with Fourier's learning and loyalty, the Emperor made him one of a small cadre of intellectuals who accompanied the 500-ship expedition to Alexandria. Aboard Napoleon's flagship, the hours after dinner each evening were devoted to disquisitions on historical or philosophical topics.

The brief years in Egypt were a disaster for Napoleon and miserable for Fourier. The Emperor abandoned his designs on the Middle East. Fourier returned to Paris tired and discouraged. As a reward, Napoleon in 1802 named him Prefect of the Department of Isere at Grenoble.

The following years until the One Hundred Days in 1815* were the most productive in Fourier's career. As a civil administrator, he saw to it that conditions in his Department were much improved; yet he still had the time and energy to carry on his most important original work in mathematics.

*After the disastrous retreat from Moscow and losing the battle of Leipzig, Napoleon abdicated and was exiled to Elba (1814). In 1815 he returned to France with a nucleus of the "Old Guard", gathered an army and again seized power. Defeated once more by the British at Waterloo, he was banished for the rest of his life to the island of St. Helena in the South Atlantic.

A Star in the Wane

With the Emperor permanently exiled to St. Helena, Fourier's long personal loyalty now worked against him. He was stripped of his position at Grenoble and only with the help of friends was he able to find a small bureaucratic post at Paris. A nomination from the French Academy of Sciences was refused him by the Bourbon government. Fourier's reputation as a scientist was so substantial, however, that the Academy overrode the veto, electing him first to membership and then to the post of Secretary.

The now aging Fourier had somehow developed the idea, perhaps in Egypt, that the way to preserve one's health was to stay as hot and dry as possible. The last years of his life he spent in a suffocating room wrapped up like a mummy, but ceaselessly talking to his friends.

He died of a heart attack in 1830.

Fourier Functions

It was during his early years at Grenoble that Fourier worked out an elegant way to describe periodic (repeating) functions. His interest was not electromagnetic radio waves, but the conduction of heat energy. His first study of the movement of heat was circulated in 1807. A formal presentation to the French Academy in 1812 was attacked by leading mathematicians as lacking rigorous proof;

nevertheless, when Fourier published his findings in their final form in 1822, he was sufficiently arrogant not to change a single word of proof from the 1812 version.

The Fourier series is a way of describing any sinusoidal (cyclical) wave in terms of the computed values of its harmonics. A simple wave might be described by only a few terms. More and more complicated waves may be described by adding expressions in an infinite series, for example:

$y = a_0 + a_1 \cos x + a_2 \cos 2x + a_3 \cos 3x + \ldots + b_1 \sin x + b_2 \sin 2x + b_3 \sin 3x + \ldots$

Fourier functions have been used to describe not only heat waves and radio waves, but many kinds of recurring events like earthquake cycles and weather cycles.

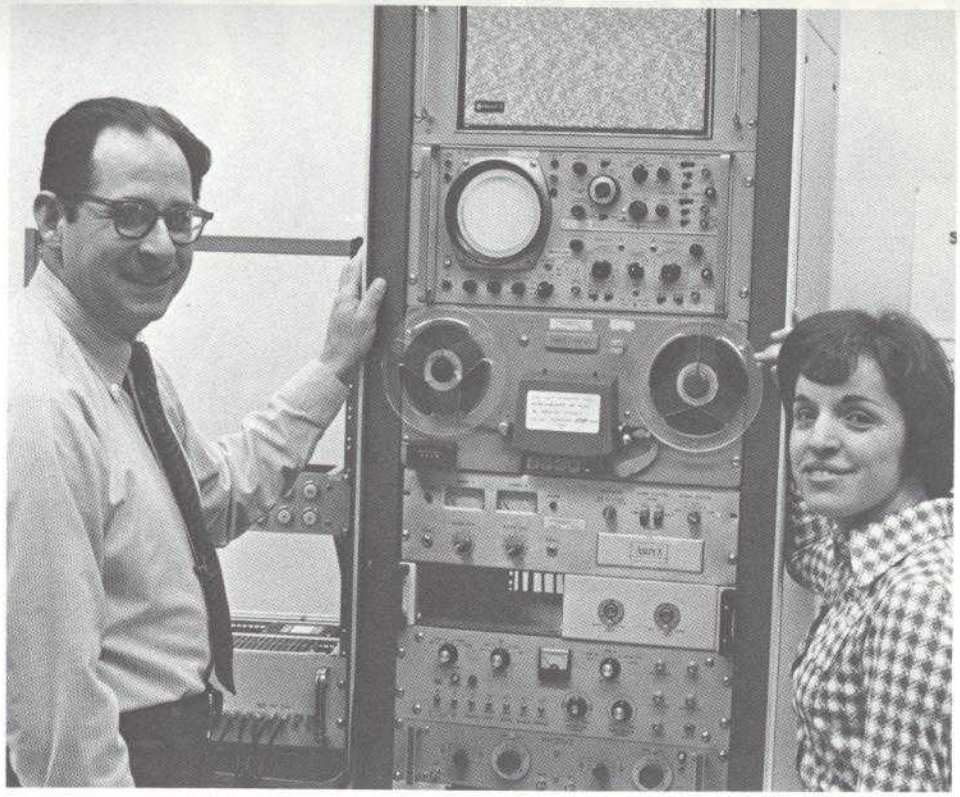
One important application of the Fourier series in communications is to examine the precise effects of given electronic devices on waves. Through Fourier analysis, the operation of a device can be scrutinized by comparing a given input signal with the corresponding output signal.

Fourier Work at COMSAT Labs

Dr. S. J. Campanella and Dr. Guner Robinson of the baseband processing branch, Communications Processing Lab, have been studying some novel applications of Fourier and other functions* to today's telecommunications systems.

Fast Fourier Transform (FFT), a way to obviate the lengthy computations required in Fourier analysis and improve compatibility with digital processing at the same time, has exciting possibilities. In FFT, a matrix computation requiring, for example, 256 X 256 separate operations, is done in shorthand fashion by using 256 X $\log_2 256 = 256$ X 8 steps. The success of FFT provides faster signal analysis and points the way toward an ultrasophisticated signal modulation technique; that is, someday in the not-too-distant future it may be possible to carry on radio communications by transmitting only Fourier coefficients. If simple earth station coding and decoding equipment using FFT modulation could be developed, the savings in bandwidth and power through the space segment could be of real significance.

**The fundamental work of Fourier spurred mathematicians to develop alternative sets of orthogonal functions. Experiments on Walsh-Hadamard and Haar functions and the Karhunen-Loeve transform are also under way in the baseband processing branch in the search for more attractive ways to represent and modulate signals.*



Drs. Campanella and Robinson display the baseband processing branch's analog-digital/digital-analog data link. The device converts analog signals like speech or television to digital form for Fast Fourier Transform (FFT) computer analysis. It can also "play back" by reconverting digital data to analog signals for subjective evaluation.

From Page 3

High Power Satellites To Be Used

for licenses to provide domestic commercial satellite communications.

The multipurpose system proposed for the first time by COMSAT called for construction and procurement of four satellites, three to be placed in orbit, two for full-time use and one an in-orbit spare, plus a fourth for an on-the-ground spare.

They would be positioned in geostationary (or synchronous) orbits at 22,300 miles altitude above the equator, with antennas focused on the United States.

Beams from the satellite antennas could provide coverage of the 48 contiguous states, Alaska, Hawaii and Puerto Rico.

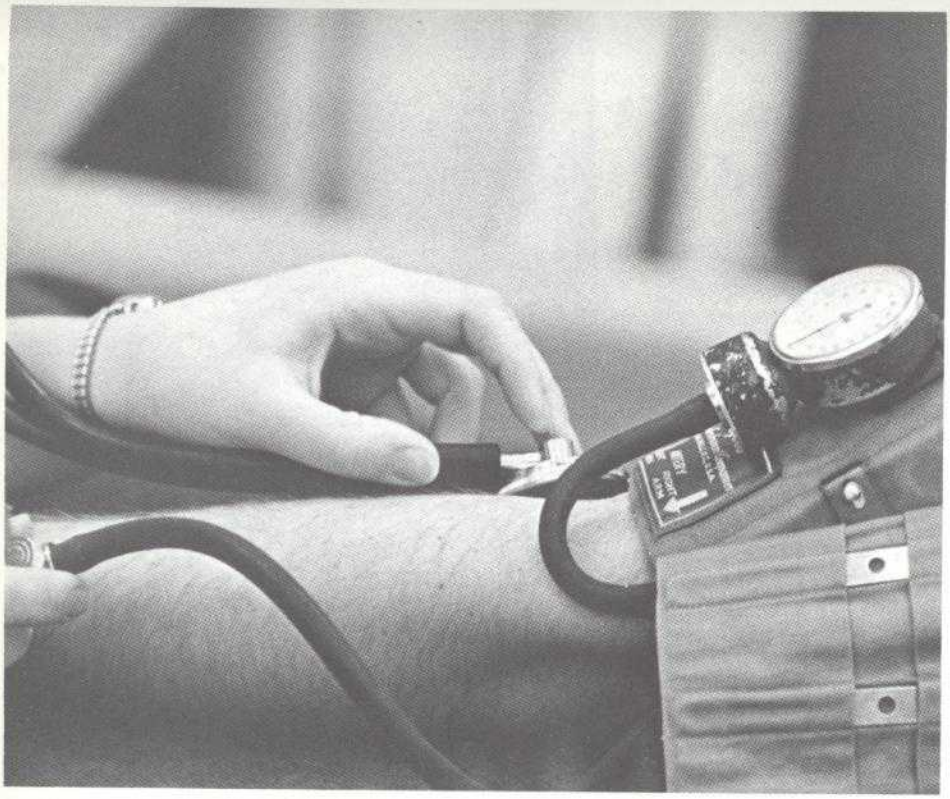
The capacity of a single satellite, when working with a large 97-foot diameter earth station antenna, would be about 14,400 telephone circuits, or more than 1,000 million bits per second of high speed digital information, or 24 color TV channels, or combinations of these.

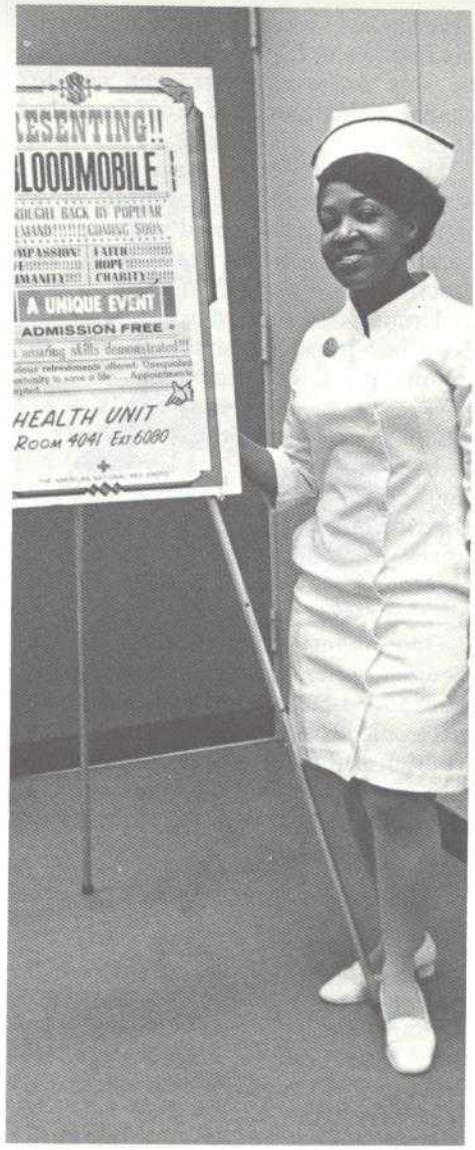
The satellites would be about 19 feet tall overall, nine feet in diameter, weigh about 1,600 pounds in orbit, and be launched by Atlas Centaur or similar vehicles. COMSAT also advised the FCC that it is continuing study on the potential of satellites that could be launched with a less expensive launch vehicle, such as the Delta, assuming that the National Aeronautics and Space Administration proceeds with the development of a new shroud and other improvements.

Each satellite, designed for a seven-year lifetime, would have 24 transponders (individual radio repeaters). They would operate in presently assigned commercial microwave frequencies in the 4 and 6 gigahertz range to take advantage of known technology and readily available components.

COMSAT said that frequencies would be used twice through application of cross polarization techniques. This major COMSAT design feature, the first such application to commercial satellites, in effect would result in doubling use of scarce spectrum space and maximizing use of limited orbital parking slots available for satellites serving the Northern Hemisphere.

COMSAT also said it plans to include equipment in each satellite for experimental work with higher frequencies in the 12 and 13 gigahertz range for possible commercial satel-

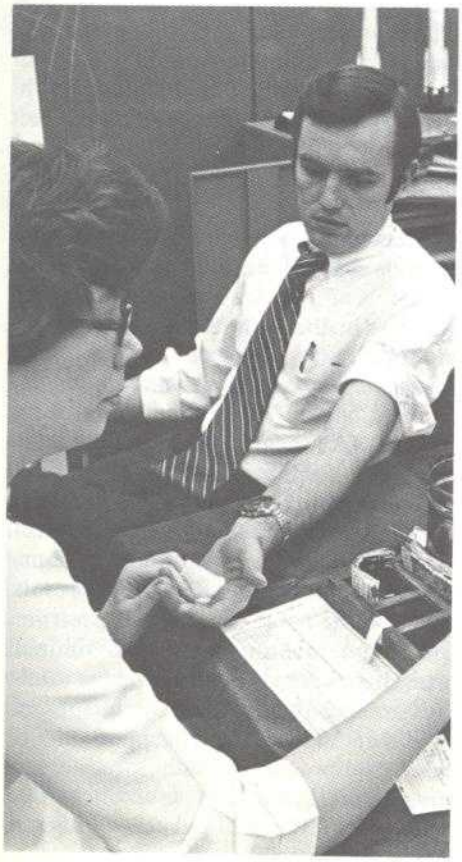


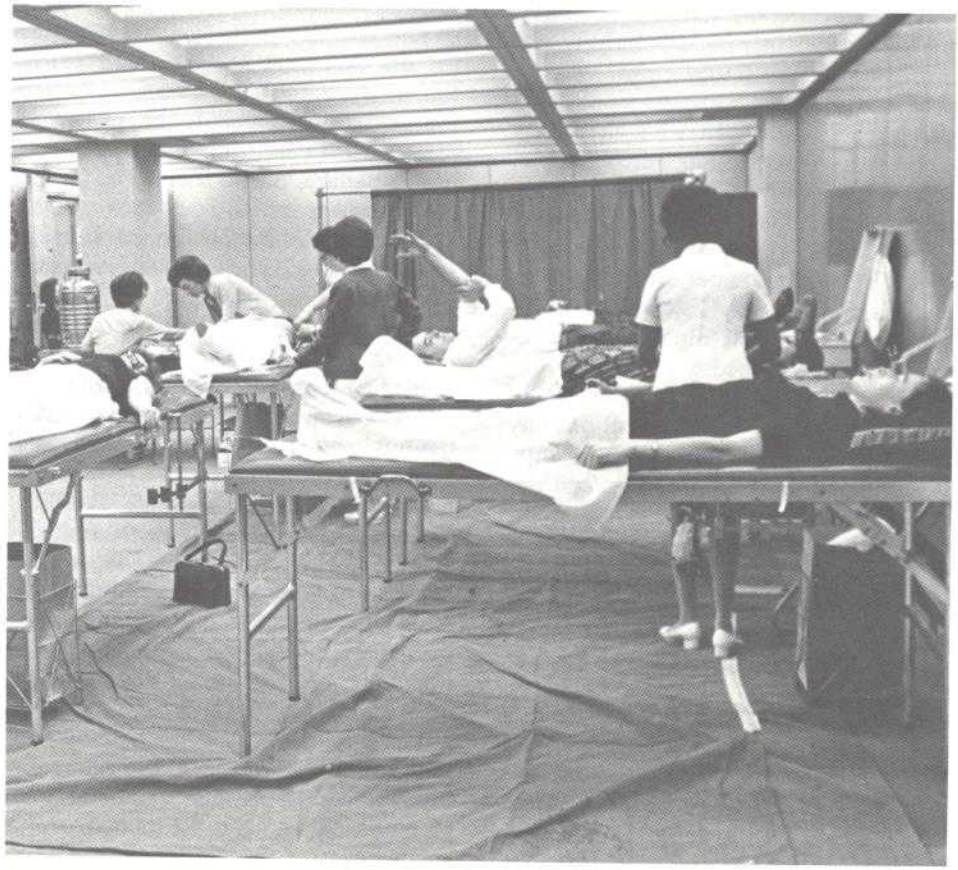


1971 Blood Drive

The Headquarters 1971 Blood Drive was held on January 27 in conjunction with the local Red Cross chapter. Ninety-five volunteers registered to give blood, 72 of whom were COMSAT personnel. The others were volunteers from the BELLCOMM and METRO offices.

In order to meet the Headquarters quota for the family plan, 36 more pints of blood are needed before June 30. Prospective donors who were not available at the time of the Blood Drive but still wish to give may do so at the time of the BELLCOMM Blood Drive planned for April 16. Contact Hazeline Durant, health unit nurse, for further information.





COMSAT NEWS

April 1971

LAB RECORDS
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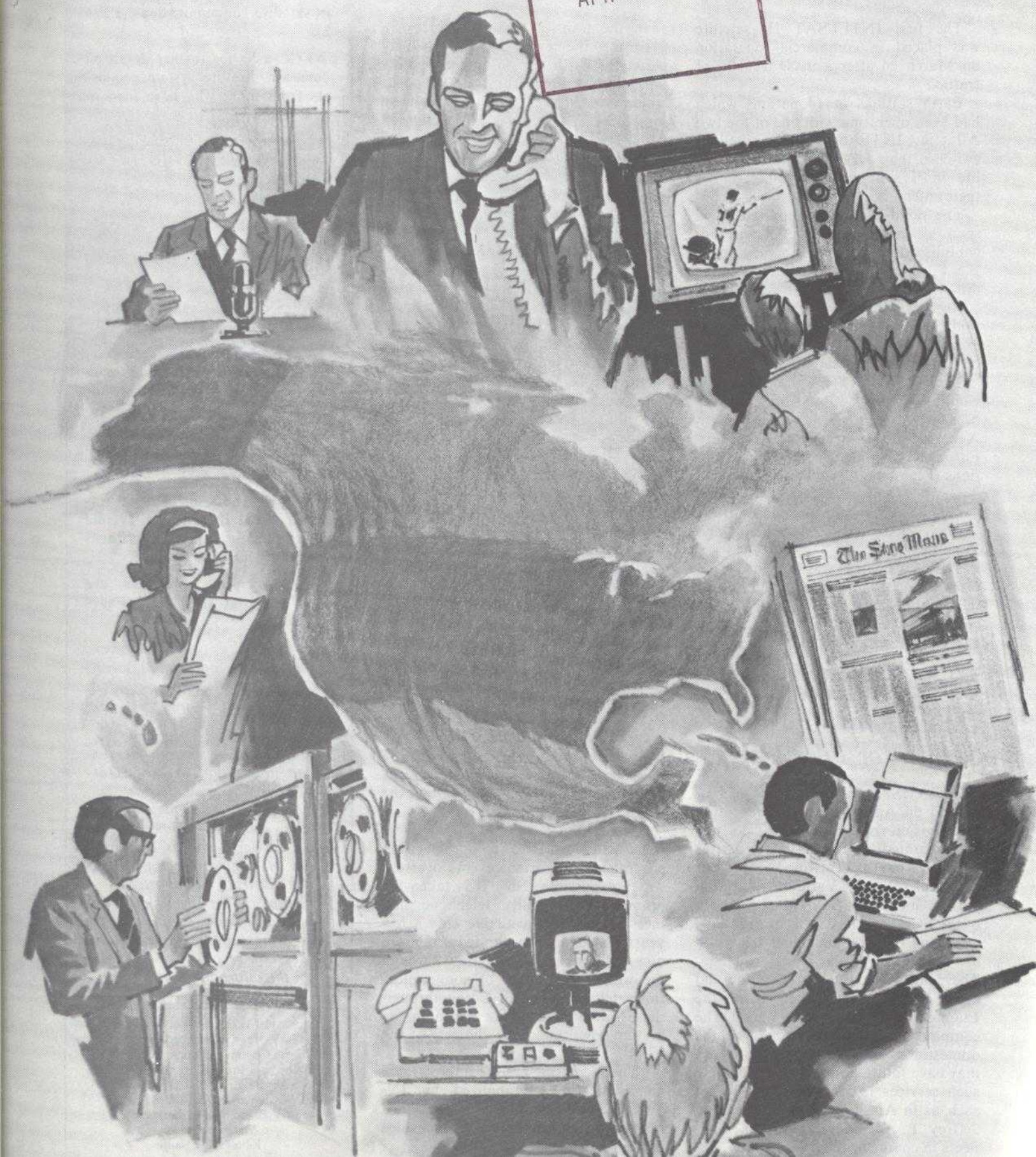

Commercial Service Begins on IV; Quality Is Considered Excellent

The first INTELSAT IV satellite was placed in commercial operation on March 26 after a mass transfer of traffic.

Earth stations in 14 nations which had been operating with one of the two Atlantic INTELSAT III satellites switched their service to the new satellite in a simultaneous point-over of their antennas.

The point-over was completed in a span of several minutes. It was accomplished as planned at night (9 p.m. E.S.T.), in a period of low traffic, thus minimizing service interruption.

Reports from the various stations said that the quality of transmission is excellent and that the TV signal is the best to date on any satellite.

The INTELSAT IV satellite is now handling about 830 full-time circuits between 15 earth stations in North America, Latin America and Western Europe. These include two U. S. stations (Etam and Cayey) and stations in Argentina, Brazil, Canada, Chile, Colombia, France, Germany, Italy, Mexico, Panama, Peru, Spain and Venezuela.

The new satellite was launched from Cape Kennedy on January 25. While the satellite was being positioned, its communications components were checked out with excellent results.

In the transfer of traffic from the III F-6 to the new INTELSAT IV satellite, the earth station antenna pointings were shifted from the III F-6, which is positioned at 37 degrees west longitude, to the Series IV satellite at 24.5 degrees west longitude.

Before the point-over occurred, however, the beacon receivers at the earth stations were pretuned to the Series IV satellite beacon. Then the point-over from the III F-6 was commanded according to a schedule prearranged by COMSAT as Manager for INTELSAT. Antenna drive motors automatically switched the antennas to the new pointing in a matter of a few seconds.

Also before the point-over could occur, transmission frequencies and bandwidth being used by the earth stations were reconfigured to be compatible with the INTELSAT IV.

One of the Atlantic INTELSAT IIIs will remain in full-time Atlantic service and will continue to handle essentially the same traffic which it has been providing over the past year. The other Series III Atlantic satellite has been designated as a spare in orbit, available for service wherever it might be needed.

Following the initiation of commercial service via the INTELSAT IV, Dr. Joseph V. Charyk, COMSAT President, said:

"The entry of the INTELSAT IV into commercial service marks another step in the success of satellite communications. Satellites have shown their effectiveness and versatility and have become a vital and permanent part of communications throughout the world.

"Before the advent of communications satellites, live color television coverage of important events overseas was not possible. Now it is taken for granted. High-quality telephone and message services, available only a few years ago on a very limited scale, are now within reach of all nations through the worldwide system of communication satellites. An earth station, through these satellites, can link any area, no matter how remote, to the rest of the world.

"The increasing ease of international communication, symbolized by INTELSAT IV, will have a continued impact on international relationships in the years ahead."

Television Reception On 16-Foot Antenna Shown for First Time

A COMSAT space first was accomplished on April 1 when the reception of television from INTELSAT IV was demonstrated on the 16-foot diameter antenna earth station located at L'Enfant Plaza. Various interested parties including Bernard Strassburg of the FCC saw the demonstrations.

This is the first time that television has been received on a small antenna. The quality of the color television and audio signals transmitted from the Etam earth station were very good. The equipment was implemented by the domestic & special project office and may have future potential for providing such services to isolated communities such as in Alaska. John P. Beyer and Jeffrey P. Steinhorn were the engineers in charge of the project.

News at a Glance

On the Cover

On the cover is a reproduction of an illustration in the COMSAT 1970 Annual Report to Shareholders. It depicts COMSAT's proposed domestic satellite services, and is one of a series of original color paintings which illustrate the report.

Copies of the Annual Report, which has been mailed to the more than 120,000 Series I shareholders of record, are available from the information office.

April 1971—Year 6, No. 3

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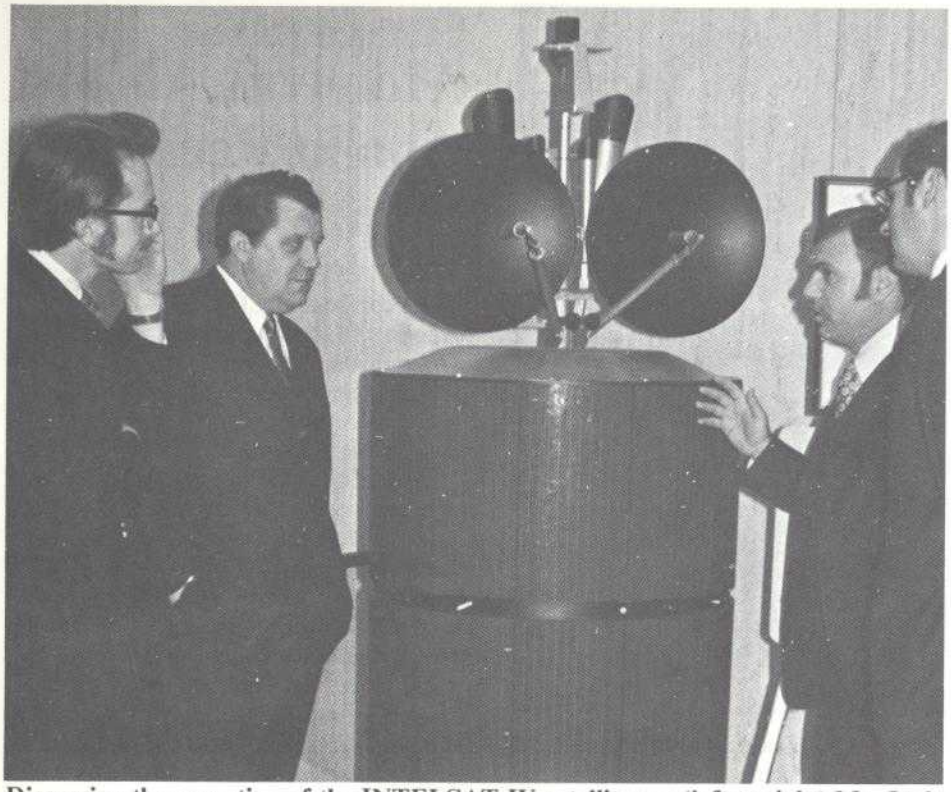
A.V.P. for Public Information
Matthew Gordon
Editor: Kay Smith



Discussing the operation of the INTELSAT IV satellite are (left to right) Mr. Jackson, USIA, Dragoljub Budimouski, Yugoslavia Federal Secretary of Information, Richard Colino, Assistant Vice President-International, and Mr. Osolmik of the Yugoslavia embassy.

Domestic System Applicants to Give Details on Filings at FCC Session

Dr. Joseph V. Charyk is expected to appear on behalf of COMSAT before the FCC on April 9, when eight applications for domestic satellite communications systems will be outlined by their proponents in closed-door sessions.

During the sessions, 30 minutes have been allowed each participant for a presentation and 15 minutes for questioning by the FCC members. Participants will not be present for the presentations by others and have been asked to confine their remarks to their own proposal.

Meanwhile, comments and reply comments to the filings of other parties are due to be submitted to the Commission by COMSAT and others on April 13, barring an extension.

The comments concerning proposed rule-making involve matters such as whether procurement regulations should be imposed by the Commission in the domestic satellite area, issues of access and interconnection, and a series of technical questions, including such things as interference, coordinates and look angles for domestic earth stations.

Intense interest by many in the domestic satellite case also was reflected in the scheduling of a panel discussion national convention and exposition held in New York City.

John L. Martin, Jr., COMSAT's Assistant Vice President for Domestic and Aeronautical Satellite Systems, represented the Corporation at the afternoon panel discussion held March 25 in the Trianon Ballroom at the New York Hilton Hotel. Other panelists included representatives of Western Union, AT&T, RCA and a University of Pennsylvania professor.

Martin outlined some of the main points in COMSAT's proposals before the FCC to provide the capacity of three in-orbit large satellites for use by AT&T, and its own multipurpose system proposal filed March 1.

"The resulting service will have the following characteristics," Martin explained:

—"The total capacity is large enough to serve all presently known needs of all users, large and small, and to allow for a reasonable growth of new markets.

—"The total capacity is not so large as to make reasonable loading unrealistic."

In conclusion, Martin told the IEEE audience:

"It is indeed ironic that this nation, providing the initiative to apply it successfully to international communications, and even assisting other nations to develop their own domestic satellite systems, is still without a satellite system to serve its own domestic needs. We in COMSAT are dedicated to establishing a domestic satellite service which will meet the needs of all elements of the using public."

Eight major plans, as of this writing, had been placed before the FCC in the domestic satellite services case. Some of the major points in these filings are the following:

—**COMSAT/AT&T:** COMSAT would launch, own and operate, and provide the full capacity of three in-orbit satellites, 24 transponders each, to AT&T; in a separate but related filing, AT&T would purchase the entire capacity of the satellites, and build five major dual-antenna earth stations and connecting links, and use the system as an integral part of its nationwide switched network; COMSAT's investment cost, including a fourth on-the-ground satellite spare and TT&C facilities, would be about $145 million; AT&T estimated its investment cost at $65.2 million.

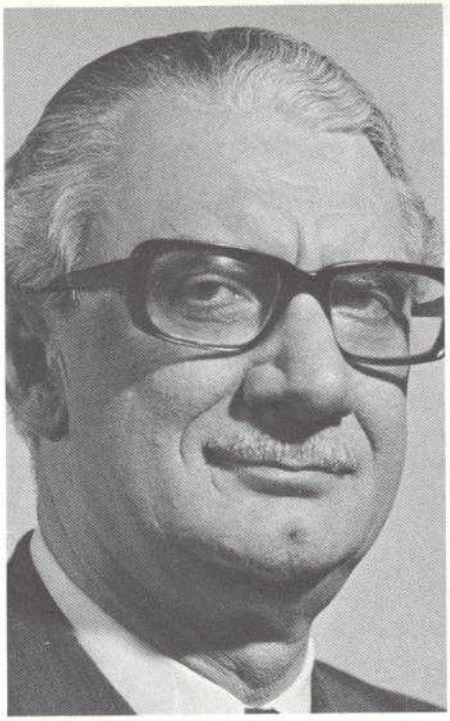
—**COMSAT:** multipurpose system employing three in-orbit satellites, 24 transponders each, owned and operated by COMSAT to serve customers outside of the Bell System; an initial network of 132 earth stations, growing eventually to as many as 174 stations; service to the 48 contiguous states, Alaska, Hawaii and Puerto Rico; investment cost of approximately $248 million initially for this system serving all types of customers.

—**Hughes/General Telephone:** Two in-orbit satellites, 12 transponders each; service primarily to the CATV industry, others on a contract basis and eight transponders committed to General Tel for its use; initially two major earth stations, eventually growing to "several hundred" for CATV services; an estimated initial investment cost by Hughes of $46.5 million.

—**Western Union:** Three in-orbit satellites, 12 transponders each, and a spare on the ground; initially some 18 earth stations with additional receive-only stations to be built for expanded mailgram service; data, TV and voice service proposed for 48 contiguous states, Alaska and Hawaii; estimated initial investment cost of $92.3 million.

—**RCA:** Two in-orbit satellites, growing to three, 12 transponders each; initially 13 major earth stations, eventually growing to a total of some 406 stations; service of all types to the 48 states, Alaska and Hawaii, with special emphasis on interstate and

Carlos A. Killian



Ernst Eliasen

ICSC Elects Killian as Chairman

The Interim Committee (ICSC) meeting in Washington, D.C., March 17-24, elected as its Chairman Carlos A. Killian of Empresa Nacional de Telecomunicaciones (ENTEL) of Argentina. Mr. Killian's term of office will be one year, commencing July 1, 1971. Ernst Eliasen of the Canadian Overseas Telecommunication Corporation was elected to serve as Vice Chairman.

Mr. Killian first served as a member of the Argentine delegation to the Committee in 1967. He is a graduate of telecommunication engineering from the University of Buenos Aires and holds the position of Manager, International Services for ENTEL ARGENTINA.

Mr. Killian has also been an engineer in the Ministry of Communications of Argentina and has served as advisor in the Telecommunications Division of the National Council of Development.

In international telecommunications, Mr. Killian held the position of Vice President of the Third Plenipotentiary Meeting of the International Telegraph and Telephone Consultative Committee (CCITT) of the ITU in 1964 and was Alternate President of the Argentine Delegation to the Fourth Plenipotentiary Meeting of the CCITT in 1968. He currently serves as President of the Subcommission of Space for the Inter-American Telecommunications Commission (CITEL), an agency within the Organization of American States.

Mr. Eliasen, the new Vice Chairman-elect, has been a member of the Canadian delegation to the ICSC since 1965. He holds a master of science in engineering from the Polytechnic University of Copenhagen and is presently the Vice President, Engineering and Operations for the Canadian Overseas Telecommunication Corporation in Montreal.

Engineers Visit COMSAT Labs

Two Washington area engineering groups recently visited COMSAT Laboratories for dinner and a tour of the facilities. The guests, accompanied by their wives, were members of the Standards Engineers Society and the Parts, Materials, and Packaging Group of the IEEE.

Following dinner, the visitors were greeted by Dr. Pier L. Bargellini, senior staff scientist, and saw the film "Anatomy of Success". Robert Strauss, manager of the device applications & reliability branch of the physics laboratory, conducted a tour of the Laboratories, including the environmental test labs, the chemical processing lab and the electron microprobe facility.

From Paumalu

Moments Aboard Apollo Recovery Ship Are Notable

Ken Elder, operations supervisor who represented COMSAT aboard the Apollo 14 recovery ship USS *New Orleans,* made several observations in referring to the recovery of Apollo 14. There was much work involved in preparing the equipment for the telecast, breathtaking moments awaiting the opening of the parachutes on the capsules and the actual splashdown into the Pacific.

What you see via television, he said, is not as exciting as the splendor of seeing the chutes open before you, the thrill of seeing the astronauts plucked from the capsule and brought aboard the ship, and the elation of being part of it.

Ken, who is a gourmet in his own right, appreciated the Navy fare, which did not consist of a diet of beans. On the contrary, he found there were many varied, tasty dishes prepared by a staff of experts. He also observed the effect of the changing times on today's Navy in the many long-haired and bearded crew members on board.

100% Licensed

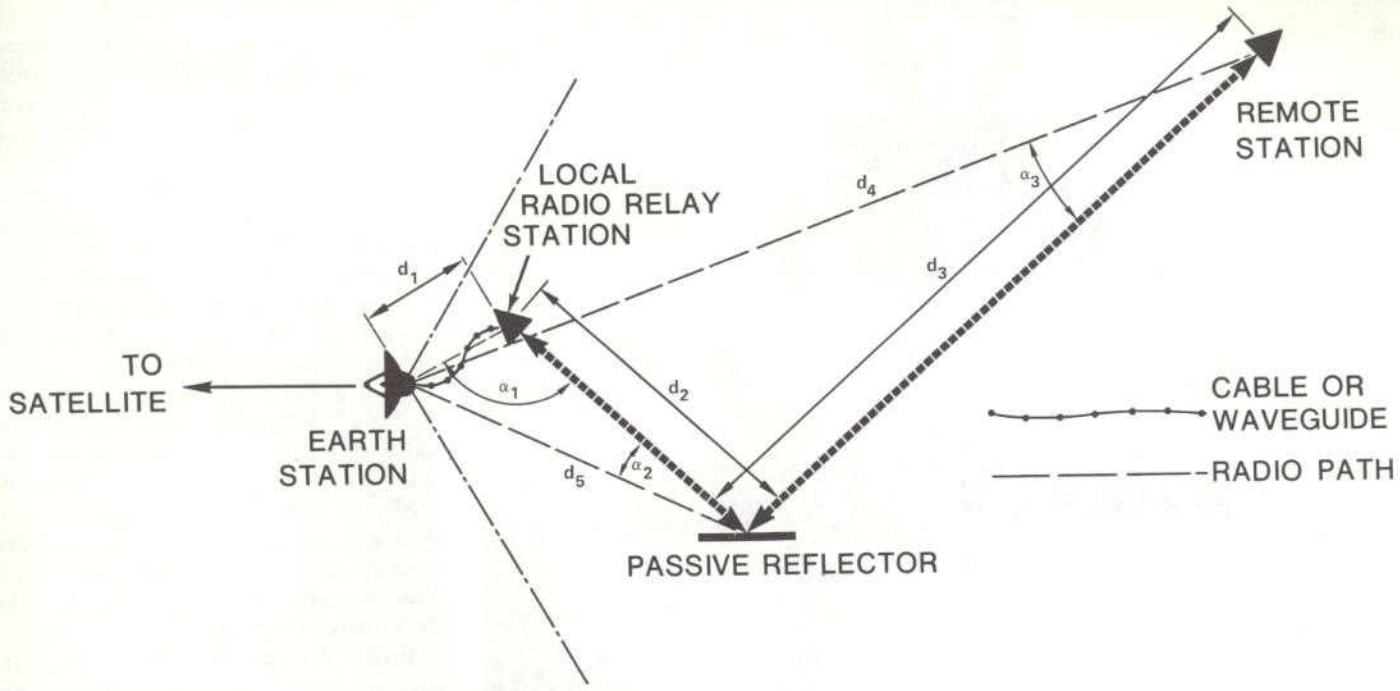
Paumalu now can boast that all of its electronic technicians meet the FCC radio-telephone license requirements. With Bob Thorpe, who has been on station for three months, successfully passing the exam on March 8, the Paumalu staff is 100 percent licensed.

TTY Class

Senior Technician Charles Kraft returned on March 21 from the month-long TTY and BRPE training program offered by Teletype Corporation in Chicago. He was most pleased to return to sunny Hawaii following 30 days of freezing weather in the Windy City. "Lucky come Hawaii," was Charlie's remark, referring to the long trip and the fact that he was happy to be back in Hawaii.

Five-Year Awards

Two Paumalu employees, Charles Ogata, operations shift supervisor, and Charles Wong, applications engineer, were presented with five-year service awards, a COMSAT tie bar, by Glenn M. Vinquist. Both employees joined the corporation on March 28, 1966, and are the pioneers of the Paumalu Station.



ENTRANCE LINK CONFIGURATION

G—7112

The above configuration demonstrates an innovative approach to separating and shielding shared radio frequencies.

COMSAT Devises Novel Approach For Use of the Frequency Spectrum

A novel approach to the use of the frequency spectrum recently suggested to the FCC by COMSAT has resulted in the serious consideration being given to revising the U.S. proposals to the World Administrative Radio Conference (WARC).

The new approach would affect the space telecommunications section of the WARC with regard to sharing the frequency band of 10.7 to 11.7 GHz.

The new approach is the idea of Jim Potts and Hans Weiss, both of the technical office, and while very simple conceptually, it represents a drastic departure from present practice.

Until now, it has been assumed that radio relay systems and earth stations sharing the same frequency bands must be physically separated by fairly large distances and should be shielded from one another.

The innovative idea is contrary to present practices in that it suggests that radio relay systems and earth stations with which they operate can share the same frequency if the separations and shielding are done in an unconventional way.

The arrangement is a rather simple one in which a passive reflector is used to attain the necessary conditions.

The reflector serves to redirect the microwave radiation so that the earth station antenna is effectively removed from the microwave beam of the remote station. The local station antenna and the earth station antenna are positioned so as to "look" in opposite directions, thus achieving the necessary isolation.

Since the radio relay link exists only to serve the earth station, it is reasonable to design it as an integrated unit which permits the necessary conditions to be realized.

The proposed scheme was studied extensively under various conditions which evidenced the technical feasibility of the arrangement. The idea is being circulated within the U.S. to invite comments and may result in changes in the U.S. proposals to the WARC-ST.

Domestic Proposal Covered Nationwide By Mass Media

An analysis of the news coverage of COMSAT's domestic satellite system proposal indicated that COMSAT's application for a multipurpose domestic satellite system on March 1 received widespread national news coverage.

The extent and depth of the news media coverage of COMSAT's filing was far greater than that given filings by other applicants. Based on a study of news clippings, the sampling showed that 293 daily newspapers, with a circulation to readers of almost 33 million, printed stories concerning COMSAT's domestic filing.

A breakdown of total figures shows that the news items were carried in 245 Sunday, February 28, editions, followed by 48 articles in daily newspapers on Monday, March 1, and in the days immediately following.

In addition to newspaper coverage, news of COMSAT's domestic proposal was broadcast nationwide, especially on Saturday evening, February 27, in TV and radio newscasts, by network as well as local stations.

Bartlett racer Al Sousa carries COMSAT's banner in the Talkeetna to Anchorage World Championship Cross-Country Snowmobile Race.

Meanwhile in Talkeetna

Bartlett's Tundra Tiger Rides Again

By Larry McKenna & Jim Shaff

Al Sousa competed in the Talkeetna to Anchorage World Championship Cross-Country Snowmobile Race. The bearded one, driving a 440 Rupp, was sponsored by Bartlett's CEA and his machine was provided by the local Rupp dealer. Al turned in an impressive performance for his first sanctioned race.

Starting from the 356th position overall and driving on a badly washboarded trail, Al was able to finish twentieth out of 65 machines which started the race in his class.

The two-hundred-mile, two-day course took a heavy toll of machines as only 267 of the 437 machines entered completed the grueling race.

Sunflower Child

Bartlett's California sunflower, Jim Shaff, is off on his vacation to the sunny Southland. Jim stopped over at Jamesburg to visit his old cronies. His itinerary includes a long stay at La Paz, Mexico, a short stopover at Honolulu, then back home to the Northland.

The snow continues to fall and fall and fall up here in paradise. Our problem has now become a matter of where to put it. Thus far this winter we have recorded a total of 126.7 inches of the fluffy stuff. Driving through the Bartlett Park housing area is somewhat akin to driving through the Baltimore tunnel.

Magnificent Retreat

Merle Albert was observed resorting to extra adrenalin when retreating from a moose that has adopted the Bartlett Park housing area as its grazing grounds. Merle found himself leading the pack of dogs back to his front porch. The final results were Merle first by a neck, Moko the husky second by a nose, Sam the Labrador retriever streaked in third and the moose was fourth by a length and a half. Merle has been awarded the flying fickle finger of fate trophy for his feat.

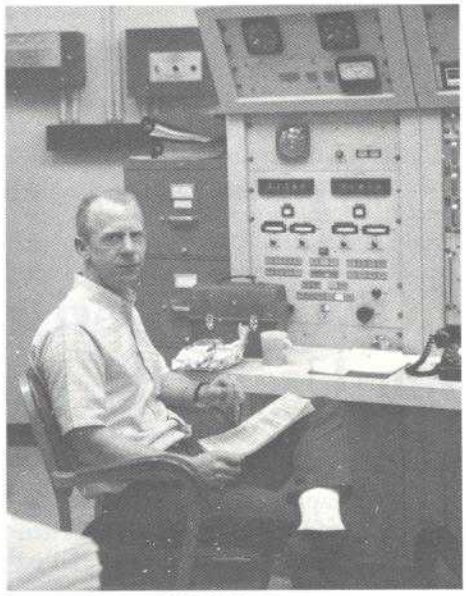
Fred Herron Brings Humor to Bartlett

In search of challenge and progress, Fred Herron joined COMSAT before Christmas. He and his family moved into spanking new facilities at Bartlett Park. Fred's dry humor is a pleasant and fresh touch around here.

Fred was born in Coco Solo, Panama Canal Zone, in 1937. Since his father was in the Navy, frequent moves were in store for him, including ones to such places as Hawaii, California, Texas, Florida and Virginia.

Fred graduated from high school in Norfolk, Virginia, and subsequently enlisted in the Air Force. He was initially assigned to schooling at Scott AFB, Illinois, where he received most of his electronic training. His younger brother also enlisted and joined Fred. The two remained together for the duration of their tours.

Fred's first civilian job was at Nor-



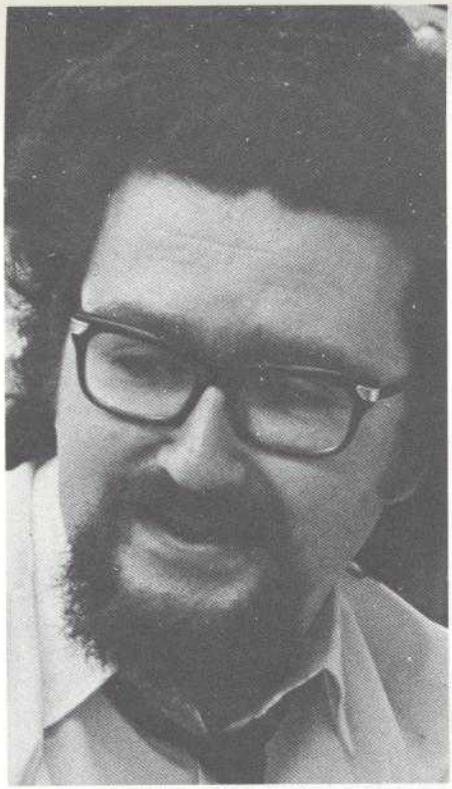
Fred Herron

folk Naval Air Station in the O & R Radar section. Later he joined RCA in Alaska on the White Alice System. He was assigned to a little town, Tanana, located on the Yukon River where he worked with Dick Attwood, now at Brewster.

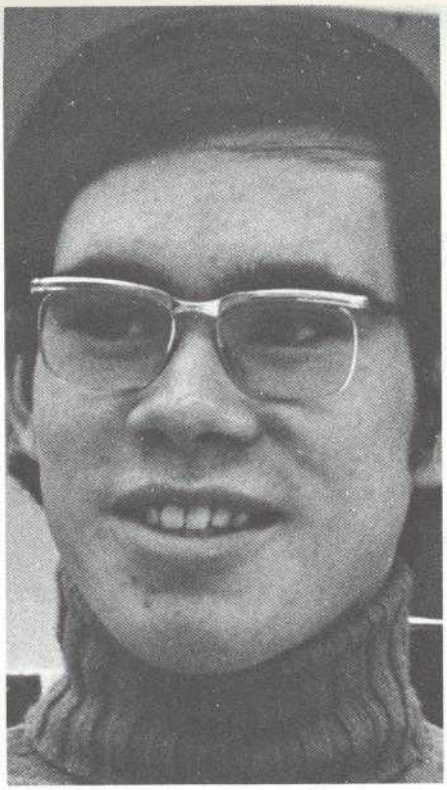
Fred met his wife Sally while in Tanana. They have two children, a boy, Douglas Wayne, and a girl, Charlene.

After leaving Tanana, the Herrons lived at Indian Mt. and were then transferred to Naknek, where they spent seven years. Fred was an active member of the school board for the Bristol Bay borough.

Naknek is famous for its deep-sea salmon fishing. Fred and Sally have developed a technique of smoking salmon that is considered a delicacy by many Bartlett friends.



Luke Engel



Gert Van Ommering

"The Projects Are Interesting Ones"

A southerner of sorts, Luke Engel came to the corporation from Tilburg, a small town in the south of Holland, in June of last year. Having taken courses in electrical engineering, he signed with the University of Technology at Eindhoven, Holland, to participate in the IAESTE exchange program here in the United States.

His exchange program landed him a job at COMSAT Labs, working for George Dill in the communications processing lab. One of his main projects has been to work on development of an onboard computer for attitude control on the next generation of satellites. "It's been fun trying to get the ideas together," says Engel, "but I wish I could be around next year when the ideas are being tested. It'd be great to see the project through."

While Luke thinks the IAESTE program has given him valuable work experience, he admits to having had some trouble getting off the ground when he first arrived.

"It's the everyday things that give you a little trouble in a new town, like finding an apartment and trying to get a car and get it registered when everything is completely new to you," he recalled. "Gert and I had a hard time getting those sorts of things done."

Gert is Gert Van Ommering, a fellow Dutchman who is also here on the IAESTE exchange from the University of Technology at Eindhoven. He and Luke share many of their IAESTE experiences, especially since they share an apartment in Gaithersburg and the car they were finally able to get.

Gert has a major in electrochemistry, and since coming to COMSAT Labs he has been working primarily with fuel cells, which provide power for the INTELSAT satellites. He says that his work with the nickel cadmium (solar) cells has been very interesting, and he thinks he's gotten enough experience to use the subject for the thesis he has to write when he returns to the University.

Many of the projects he's done for COMSAT have been a part of a group effort, since much of the work in the spacecraft laboratory under W. Billerbeck is a teamwork effort. "The projects are interesting ones," he observed.

After finishing his projects at the Labs in late June, Gert would like the opportunity to tour some of the U.S. before returning to Holland. He and Luke haven't had a chance to tour too much yet, aside from the cities on the eastern coast.

"It'd be a great experience to see the Grand Canyon and some of the western coast before leaving this country, but I know traveling is expensive," he thought aloud. "Maybe we should get a Volkswagen bus and just make a leisurely trip all the way west."

This is the second of a series of articles on the students participating in the International Association of the Exchange of Students for Technical Experience (IAESTE) program. The purpose of the program is to afford students the opportunity to live and work in foreign countries, with an emphasis on the cultural and technological exchange.

COMSAT Gets NASA Contract

NASA announced on March 26 the award of a contract to COMSAT for the development, fabrication, installation and operation of an advanced communications experiment for the applications technology satellite ATS-F spacecraft. The fixed price contract is for 2.88 million.

Under provisions of the contract, COMSAT will provide a spacecraft transponder, a receiver terminal operation, 24 ground transmitter terminals and two prototype transmitters. In addition to space segments, the first to be manufactured by the Labs, COMSAT will operate the experimental ground equipment for a period of six months.

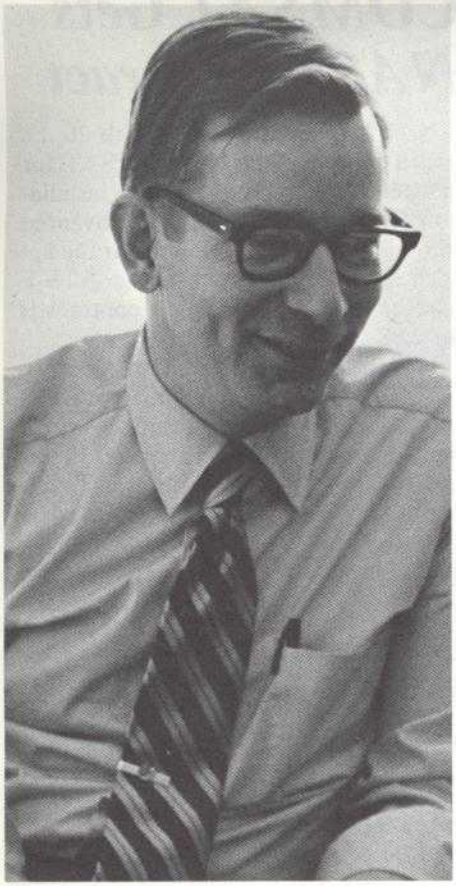
Arrangements for the contract with NASA were made by John Keyes, manager, planning and applications, COMSAT Labs. The contract, obtained in a competitive bid situation, was based on a technical scheme devised by John Kiesling, Systems Lab.

Program manager for the contract will be J. Levatich, manager, systems integration lab, reporting to Emeric Podraczky, manager of the Systems Laboratory.

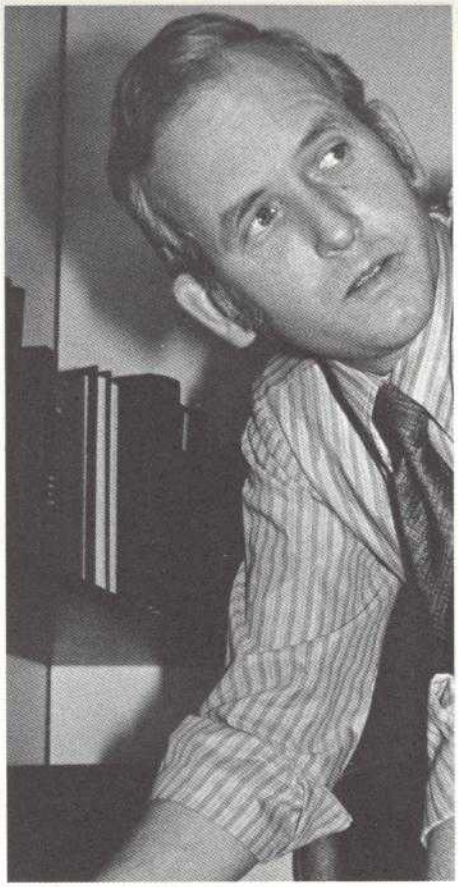
The design and manufacture of the transponder and the 24 earth terminals will be under the direction of Lou Pollack, manager of the RF Transmission Lab. Lab members on the project will be Arnold Berman, Larry Gray and Dr. Chris Mahle.

The Physics Lab, managed by Dr. Edmund Rittner, will be responsible for the reliability and quality assurance functions. Also working on the project will be the device applications and reliability branch under the supervision of Robert Strauss.

Called the ATS/COMSAT propagation experiment, its purpose will be to gather data to determine minimum power margins required for advanced communications systems at 13 and 18 GHz. The experiment will also investigate propagation attenuation caused by severe localized storm conditions.



With a background in celestial mechanics, Norm Schroeder, manager, implementation branch, maintains the computer discipline. He must be sure that what is done on the computer is accurate.



In charge of the astrodynamics branch, Bill Kinney, Ph.D. in engineering, is the master planner for mathematical simulation projects. Here he compares tracking data from a TT&C station with theoretical predictions.

Arnold Satterlee, manager, celestial mechanics, runs his department with tight coordination between the astrodynamics and implementation branches, a necessity for the satellite pinpointing function which his people perform.

In Celestial Mechanics

Somebody's Keeping Tabs on Satellites in Orbit

If there's a department at COMSAT that sounds like an ivy tower institution, it's the celestial mechanics department. From the mere sound of the name, one can conjure up all sorts of fantasies about the ancient magic of heavenly bodies.

But, while celestial mechanics literally means the movement of heavenly spheres, that's about as far as the resemblance between the department and ivy tower contemplation goes. The people in celestial mechanics are down to earth.

The department performs the theoretical formulations and the subsequent numerical calculations of all the in-orbit information required to operate the INTELSAT ground station and satellite communication network. In carrying out these functions, the staff relies heavily on the use of computers.

A major portion of this effort is concerned with satellite station-keeping, a process in which propulsive maneuvers are performed to maintain the orbital position and attitude orientation within prescribed operational limits during its lifetime.

The department is organized into two branches. The *astrodynamics branch* develops the mathematical techniques which are necessary to describe the satellite's dynamic motion. This requires maintaining an accurate mathematical description of the forces acting on a synchronous satellite as well as developing efficient methods of processing telemetry and tracking data for precise attitude and orbit determination.

The *implementation branch* has the responsibility of developing and maintaining a computerized information system on each orbiting satellite. The tracking and telemetry data collected by the four INTELSAT TT&C ground stations form the main input to the computer system. This data is processed by a variety of computer programs which derive the geometric and dynamic parameters required in day-to-day operations.

In addition to supporting the daily operation of the satellite system, the staff of the department plays an integral role in the initial placement of each satellite in synchronous orbit. During a launch period, the majority of the staff is on continuous, round-the-clock duty for as long as 48 hours. During this time, the department performs all analyses and calculations required to insert each satellite into its operational orbit.

Bernie Coleman, foreground, and Ron Jennings are the computer data technicians who keep the department in constant motion. Mr. Coleman specializes in attitude and telemetry programs, while Mr. Jennings generally takes charge of orbital determination and ground station programs.

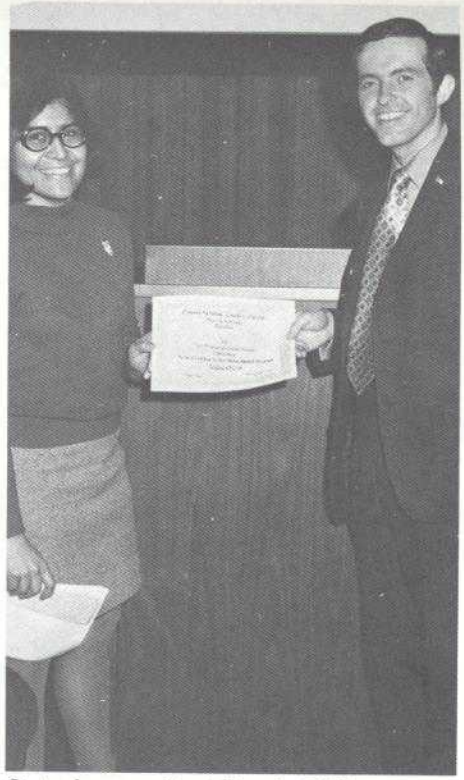
Tony Corio works on an attitude determination problem with Gayle Garett, program analyst.

Carol Smith joined COMSAT shortly after its formation and has become an expert in implementing astrodynamics theories into computer language.

The newest member of the staff, Dennis Beaufort, checks readouts with Vera Wilson, program analyst in the astrodynamics branch.

Dr. Victor Slabinski, a physicist by background, has gained a reputation as the "house astronomer".

Randy Williams reports to the members of the credit union while Ted Gottry (center) and Jim Kilcoyne listen.



Outgoing president Randy Williams presents the door prize, $50 in credit union shares, to winner Diane Pontti.

Successful Year Reported at Credit Union Meeting

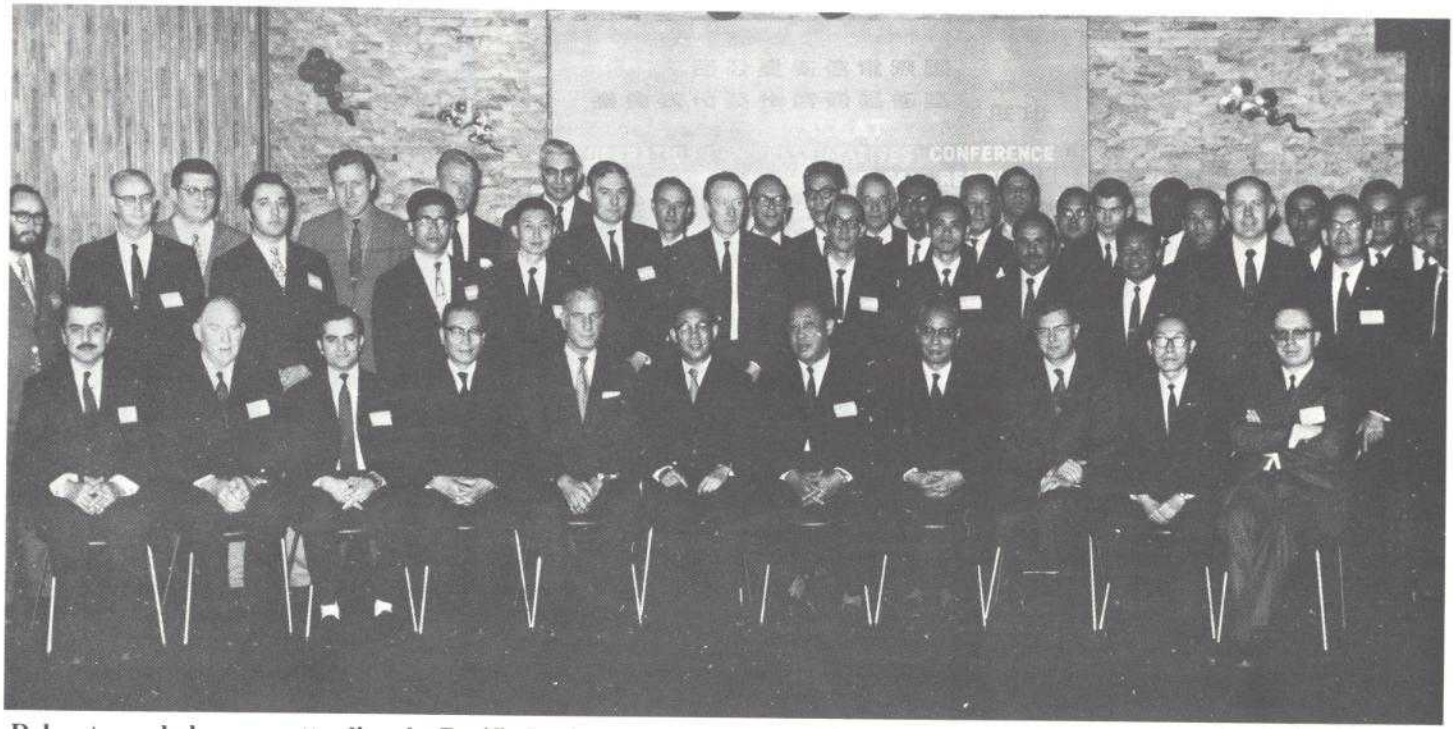
The annual meeting of the COMSAT Federal Credit Union was held on March 30 in the COMSAT Visitors Center. About 110 members of the credit union were present for the reports of the president and other officers.

After having obtained approval of the minutes for the last annual meeting, Randy Williams, the outgoing president, gave a report of the growth of the credit union during 1970.

The year opened with $450,000 in shares and showed a year-end share total of $798,000. Membership increased from 770 to 964, representing 77 percent of COMSAT personnel.

Ted Gottry gave the treasurer's report for Bill Kaht, who was not able to attend the meeting. He reported that credit union gross income for 1970 was $67,000, more than double that of 1969. Mr. Gottry also estimated that the gross income for 1971 would be approximately $100,000, and the share investment at the end of the year would be well over the $1,000,000 mark.

(See Credit Union Annual Meeting, Page 11.)



From Page 3

Domestic Proposals Offered to the FCC By Eight Applicants

intrastate service to Alaska; initial investment cost of about $169.4 million.

—**MCI-Lockheed:** Two in-orbit satellites, three-axis stabilized, 24 transponders each; initial deployment of some 20 earth stations, 15 of these to be located in downtown areas and operate at 12 and 13 gigahertz, additional earth stations to be added later; services emphasize data, but include voice, TV and message to the 48 states, Alaska, and Hawaii; initial investment cost estimated at $169 million.

—**Western Tele-Communications/ North American Rockwell:** Two satellites in orbit, 12 channels each, operating at 4 and 6 and 12 and 13 gigahertz; four large stations, plus more than 125 added stations for eventual system; serve 48 states, Alaska and Hawaii, providing all communications services; North American Rockwell was chosen to provide the space segment; estimated initial investment cost of about $66 million.

—**Fairchild Hiller:** Two in-orbit very large satellites, each a derivative of ATS-F technology with capacity of some 120 transponders, operating half at 4 and 6 and half at 7 and 13 gigahertz; six mainland earth stations and one station each in Hawaii, Alaska and Puerto Rico; providing all forms of service, including two free channels for the public broadcasting service; estimated investment cost of about $220.8 million.

Other parties also filed in the case, including TelePrompTer but the above represent the major system applications.

From Page 10

Credit Union Annual Meeting

Jim Kilcoyne, outgoing vice president and chairman of the loan committee, gave the report on loan activity. The dollar value of loans approved during the year was $777,000, up from $578,000 in 1969. The number of loans had increased from 510 in 1969 to 646 in 1970, with the average amount loaned being $1,203.

The breakdown into categories of loans was as follows: signature loans, 59 percent; new car loans, 25 percent; shares activity loans, eight percent; used car loans, seven percent and others, one percent.

Following the reports, members approved the motion to increase the number of board members from five to seven. Subsequently, nominations were accepted for the three vacant board positions. Bill Kaht, Betty Stover and Joe Wellington were nominated and elected by unanimous consent for three-year terms. Remaining on the board were Jim Kilcoyne, Paul Rankin, Ted Gottry and Randy Williams.

The drawing for the door prize of credit union shares valued at $50 was held following the elections. Pat Lamphear volunteered to draw the winner's name from among those who attended the meeting. Diana Pontti, Operations, was the lucky winner.

The meeting concluded with a party for credit union members and guests. About 100 people enjoyed the wide sampling of wine and cheese provided.

CFCU Board Elects Officers

Elected to a one-year term as president of the COMSAT Federal Credit Union at a board meeting following the annual meeting was Jim Kilcoyne, who succeeds Randy Williams as president.

Other officers elected from among the other six board members were Joe Wellington as vice president and Paul Rankin as treasurer and general manager. Betty Stover was elected secretary and Ted Gottry named as assistant treasurer.

Heading the credit committee will be Randy Williams, while members of the committee will continue to be Gene Christensen, Carl Sederquist and Walt Kutrip. Bill Kaht will be available for special projects.

Other credit union committees, such as the loan, supervisory and education committees, are scheduled to be arranged at a future board meeting.

Delegates and observers attending the Indian Ocean Region Operations Representatives Conference in Taiwan March 1-3, 1971

Spring, Summer Sports Events In Full Swing

Since girls' basketball was a huge success, athletics chairman Jack Dicks has decided to further develop female participation in sports. This year, CEA is giving the girls an opportunity to play competitive softball in a fastball league. Practice began the latter part of March under the direction of infield coach Mel Harley and assistant coach Ty Ricks. Competitive play begins in May. In the interim, 22 enthusiastic Plaza softball swingers are getting in shape for a tight season—and hopefully a successful one.

Since these girls don't feel that they are the weaker sex, rumor has it that they plan to challenge the men's team as well as the girls at COMSAT Labs at the close of the season.

Want to play? There's still time left to get in on the swing of things! Contact Mel Harley, coach, on Ext. 6676.

Anything can happen when you attend the AFI Wednesday and Friday noon film series in the L'Enfant Plaza Theater. Theater goers are invited to bring their snacks.

Senators Fans See Opener

Once again, the old familiar tune of "Take Me Out to the Ball Game" could be heard around the offices at COMSAT prior to 1:30 p.m. game time on April 5. Eighty CEA members and friends saw the opening game of the Senators' season that afternoon—an afternoon of hot dogs, peanuts and cracker jacks—at R. F. Kennedy Stadium.

Men's Softball

Members of the men's softball team at the Plaza are looking forward to a second winning season. Practice begins the first week of April, with approximately 20 enthusiastic players expected. Regular season play in a fastball league set up by the D. C. Recreation Department begins the third week of April. Anyone interested in joining in on the fun please contact John DeCaro, Ext. 6847, or Jim Hall, Ext. 6850.

Approximately 50 people will be playing intramural softball at the Labs.

Athletics Field

Work has started on grading the athletics field at COMSAT Labs. Anyone interested in giving a helping hand should contact CEA President, Tony Buige, on Ext. 4479.

CEA Headliners

Annual Spring Golf Outing Set

By Beverly J. Nitkowski

This year, the CEA is sponsoring its first spring golf tournament. The date is Wednesday, April 21, the time is 12 noon and the place is the Washingtonian Country Club. The tournament will be played using the Calloway Handicap System. A fee of $5.50 per person will be charged and prizes will be awarded. Please sign up by April 14. See P. Fleming, Labs, or J. Dicks, Plaza.

Boating Club

Lou Early, boating club president, has announced that a piloting and small-boat handling course is being given by the Potomac River Power Squadron. The class is open to any boating enthusiasts, whether they are sailing or power bugs. There is no charge for registration, course booklet or examination. Textbook and other materials are optional, but are recommended. BELLCOMM boating club members are welcome. For further information contact Angie Brown, Ext. 6076 at COMSAT, or Herman Kraus at BELLCOMM.

The "Hot Pants" girls' basketball team (alias the "Long Shots") is not giving up after a season of defeat. Coach Tyrone Ricks feels that next season will be a winning one.

This spring, and continuing throughout the summer months, the CEA is sponsoring a basketball camp for girls' basketball. The camp, located at 275 G Street, S.W., began the week of March 22 with much enthusiasm.

Homeowners' Club

It looks as if CEA's first revival, the homeowners' club, is off to a good start. Jack Phiel, chairman, says that things are beginning to grow with the spring growing season. Anyone interested in getting in on this should call Jack on Ext. 6116. Guest speakers are being booked for future meetings.

Headquarters Lobby Is the Site

Spring Cocktail Party Planned

Kitty Stephenson and Bob Cool, CEA's social co-chairmen, have announced that this year's spring cocktail party will take place Friday, May 7, 1971, from 6 to 9 p.m. in the first floor lobby at the Plaza. Refreshments will be served and door prizes awarded.

As a special attraction, music for your listening and dancing pleasure will be furnished by "The Personalities".

Those of you who missed the Mardi Gras Dance also missed the great show put on by the fabulous "Personalities". CEA is taking this opportunity to help you make up for the night you missed —back by popular demand, once again we present "The Personalities". Get ready for an evening full of the songs that were your favorites when you were in high school, college or who knows where. This versatile band can and will play almost anything at your request. Tickets will go on sale soon.

Social Calendar

Like all CEA activities, the social events are growing bigger and better to suit the needs and desires of the members. With this in mind, Kitty Stephenson and Bob Cool, co-chairmen, are already deep in plans for the annual picnic.

The board of directors knows that many of you find the picnic one of the association's best. The social directors hope to make this year's picnic better than ever, but to do this they need your cooperation. Please contact either Kitty or Bob if you are willing to give them a helping hand, if you have a good suggestion or if you play a musical instrument.

The event is scheduled for the latter part of June, but a definite date has not yet been set.

Astronomy Club News

The starry-eyed members of the astronomy club came down to earth long enough to report their findings on the phenomenon of the lunar eclipse which occurred February 10-11. Various shadows of the earth's shadow on the moon were observed. More complex observations were made and recorded on timing of occultations and crater crossings. Data was compiled and sent to *Sky and Telescope Magazine*, which in turn will submit it to the U.S. Naval Observatory.

At the end of this month, NASA and the Max Planck Institute of Germany are sponsoring the release of a barium ion cloud located at 5 earth radiae (roughly over Central America just north of the equator, 75° in the sky). Club members will attempt to photograph the cloud with the aid of telescopes and photographic equipment. Bill Young states, however, that anyone can observe the cloud without a telescope since it will be visible to the naked eye.

If you are interested in more specifics, see the March and April issues of *Sky and Telescope* or contact Vic Slabinski, Ext 6328.

Satellite Jewelry

Need a gift that is really different? How about some satellite jewelry for that special person? See Pat Lamphear, Room 6273 at the Plaza, on Fridays from 12 noon to 1 p.m., or Delores Hess, Room 2101 at the Labs, on Wednesdays from 12 noon to 1 p.m.

QUESTION: Will "hot pants" go or grow? Submit your comments to Bev Nitkowski.

Potpourri

The CEA is looking into the possibility of taking tours at a reduced group rate. Have any suggestions or ideas? Call Jim Tallon, Ext. 6550.

Remember, only CEA members can take part in CEA-sponsored activities. If you are not as yet a member, contact Bert Runfola, membership chairman, Ext. 6571.

Anyone interested in playing volleyball at the Labs should contact Marty Earl, Ext. 4249.

Since many of you have expressed an interest in bowling, CEA is attempting to get a mixed team going. If you want to take part, please call John Maddox on Ext. 6851.

Redskin Tickets

The CEA will have tickets to two exhibition games of the Washington Redskins. Notices concerning ticket sales will be circulated as soon as tickets are made available to CEA.

CEA Camera Club Wins 3 Top Awards In Area Competition

The CEA camera club entered the Greater Washington Council of Camera Clubs competition the weekend of March 20 and came away with three top awards.

The club made entries in three categories—small and intermediate black and white prints and color slides. The first- and seventh-place awards were given to CEA members in small black and white prints, and tenth-place award was received for a color slide entry.

Thirty-four camera clubs in the metropolitan area entered the competition held at George Washington University. Winning entries can be seen on display at George Washington University hospital.

The club is planning to show slide programs at future meetings on how to take better pictures. Warm weather outing plans are also under way. Want a chance to "show off" your skills as a photographer or a chance to learn how to take the desired photos? Contact President Alan Coburn, Ext. 6772.

Levatich and McBride Plan Busy Net Season

Jay Levatich and Dick McBride, who have done such a fine job in the past with CEA's tennis teams at the Plaza and Labs, are currently busy with plans for another active tennis season. They have advised that ladder play will soon be in full swing.

A round-robin mixer tournament will be held again this spring at East Potomac Park. Watch for flyers with dates and times.

Jay recommends that players get out this year and practice so that everyone will be ready for the big tournament which will be held this summer. "A" and "B" groups will be set up for the tournament.

New players and suggestions are welcome.

Shady Grove Tickets

Discount tickets for the Shady Grove Music Fair are being sold again this year. For information and tickets see Emogene Madison, lobby receptionist at the Plaza, or Pat Thompson, 7th floor receptionist.

During the Bartlett dedication, Pilot Shelton talks with a visitor and Former Alaska Governor Keith Miller (center), while W. Lauterbach looks on.

Don Shelton's landing strip is near the center of town, just to the left of where the truck is turning.

'Later, he managed to land on the mountain on a hidden plateau at 14,000 feet. For the next four days and nights, he was in the air almost constantly, making landing after landing. In the end, he plucked 18 people off the slopes . . .'

Bartlett's Northern Neighbor

Pilot Sheldon Dares Rugged Terrain, Volatile Weather to Fly Passengers

A front-page story in the *Wall Street Journal* recently featured famed bush pilot Donald Sheldon, a northern neighbor of a number of COMSAT's Bartlett Earth Station personnel in Talkeetna, Alaska.

"Lithe and wiry, 49-year-old Don Sheldon belongs to a brash breed who challenge, in flimsy flying machines, some of the world's most volatile weather and desolate terrain," wrote the *Journal*.

Sheldon is well known to many COMSAT employees. Officially, he runs the Sheldon Flying Service, located in the heart of Talkeetna a few hundred feet down the graveled single main street from a sign which reads, "Welcome to Beautiful Downtown Talkeetna".

He often lands his single-engine planes on a runway that stops at an intersection with the main street, which could be considered perhaps the most convenient midtown airport in the U.S.

COMSAT hired the services of this intrepid one-man airline on a number of occasions. He piloted the plane used in making aerial photographs of the Bartlett Earth Station site on several assignments, both during construction and after the station began commercial service on July 1, 1970.

One COMSAT employee can recall vividly a flight with Sheldon from Anchorage to Talkeetna in June of 1970. The Washington-based COMSAT visitor, after monotonously watching out the window for 25 minutes, made the mistake of mentioning that he had not yet seen a live moose.

Very quickly, the plane dipped, dropped, and at tree-top height with the plane banked on the tip of the right wing, Sheldon pointed out for his shaken passenger a female moose grazing near a small lake. How he found that single moose amid the vast forest floor below is a mystery.

The *Wall Street Journal* story, bylined by James E. Bylin and datelined Talkeetna, was one of a series. The newspaper explained: "Every deskbound minion of business or government has yearned at some time for a taste of adventure. But some men face perilous challenges as part of their everyday routine. This is the fourth of a series of profiles of such men."

Here are some excerpts from the WSJ story:

Looming some 75 miles from the town (Talkeetna), a short hop in this country, is the majestic Alaska range, crowned by 20,320-foot Mt. McKinley, the highest peak in North America. Sheldon early staked out an almost exclusive franchise to Mt. McKinley.

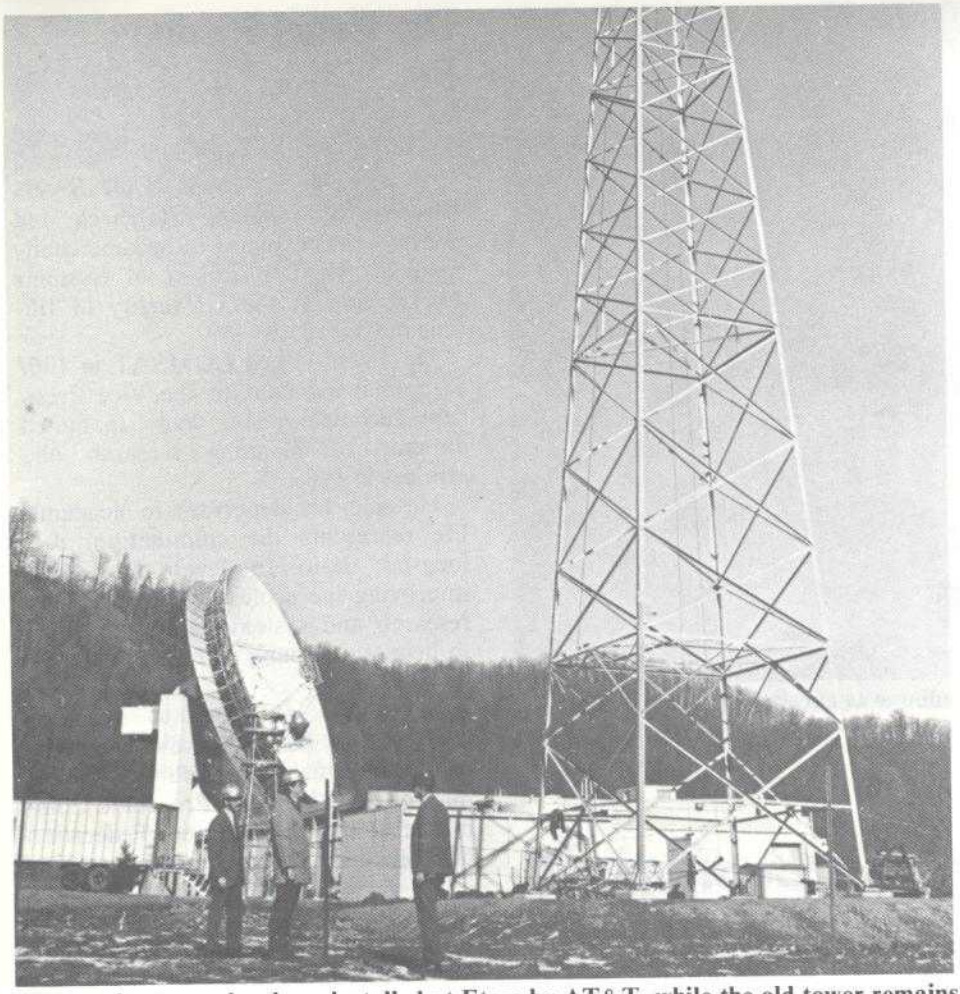
In 1960, two separate expeditions climbing Mt. McKinley ran into trouble. In one, a woman was near death in a coma. Relying on thermal drafts to force his plane to altitudes it couldn't reach on its own, Don made repeated airdrops of supplies at 17,000 feet.

Later, he managed to land on the mountain on a hidden plateau at 14,000 feet. For the next four days and nights, he was in the air almost constantly, making landing after landing. In the end, he plucked 18 people off the slopes, including a safe journey for the ill woman.

Flying near the town of Wainwright, above the Arctic Circle, he was engulfed by a whiteout, a feared condition peculiar to the region. He likens it to flying in a bowl of milk. Light filtering through a cloud cover becomes equal to the light reflected off the snow, blotting out the horizon as well as the pilot's ability to discern land from air. Only dark objects can be seen.

"I was good and disgusted until I caught sight of a friendly shoreline," he says. It was a ridge of ice more than 100 feet high. He followed it and, just as suddenly, lost sight of it. "I was really sweating it," he allows. Then his passenger, a fur buyer, caught sight of a red fox. "It looked like it was going up our right wing."

They were actually flying below and precariously close to the ridge. Don gained altitude and began searching for a caribou herd. During whiteouts, caribou give pilots some perspective and also an indication that the land probably is flat and landable. He did spy what he took to be grazing caribou. "I just landed," he laughs, "and nearly ran over an old Eskimo and his 10 dogs."



A new relay tower has been installed at Etam by AT&T, while the old tower remains in the background, overshadowed by the 97-foot antenna.

News from Etam

The Case of the Data Bit Mystery

By Deloris Goodwin

Frank Klisch of the technical staff arrived at Etam recently to take measurements of data error rates, and in doing so ran into quite a mystery.

The bit error counter registered almost no errors from 8 o'clock in the morning until approximately 4:40 p.m., when a continuous counting on the bit error counter began. This coincidence happened three consecutive evenings at the same time, with the high error count continuing until about 4 or 5 o'clock the following morning, when all returned to normal.

A few days later, Marv Bowser of the system management office arrived and cleared the problem, but did not solve it. With a replacement voice frequency modem, the new unit went through the critical period (4:15-4:45 p.m.), and no bit errors were observed. However, when the old unit was placed back into operation at 4:45 p.m., the bit errors began again.

Strangely enough, moving the old modem from the bottom shelf of the test cart to the top shelf stopped all errors.

One could think this modem might be altitude sensitive, but the distance from the bottom to the top shelf is only two feet. The mystery remains as to why the errors came at that particular time of the day and subsequently disappeared well before sunrise.

Operations Supervisors Hold Meeting

The operations supervisors at Etam, J. Evans, J. Formella, R. Hobbs and P. Helfgott, held their first meeting to discuss the proposed proficiency training plan, the modified trouble report register, benefits gained from a regularly scheduled operations supervisors meeting and general station operations.

Information on Etam Forwarded

Mr. Robert Halbritter, Preston County member of the West Virginia House of Delegates, recently requested information on the Etam station. William Carroll, station manager, forwarded sufficient copies of Etam Earth Station brochures to Mr. Halbritter and asked that they be distributed to each member of the West Virginia Senate and House of Delegates.

Visitors to Etam

Recent visitors to Etam Earth Station include J. Ball, R. Hill, M. Bowser and F. Klisch of Headquarters; W. Schmidt, B. Pontana, J. Kiesling and B. Magenheim from COMSAT Labs; Orm Wade, AT&T division operations manager, and Bob Krese, AT&T district manager for West Virginia.

Personal Notes

William Carroll and his wife announced the engagement of their daughter, Sandra, to Jeffrey L. Webb, son of Mr. and Mrs. Ralph E. Webb of New Carrollton, Maryland. The Trinity United Methodist Church of Salisbury, Maryland, will be the scene of the June 26 wedding.

Miss Carroll was graduated from Salisbury State College and is a teacher in the Wicomico Junior High School. Mr. Webb, also a graduate of Salisbury State College, is employed by the Wicomico County Board of Education.

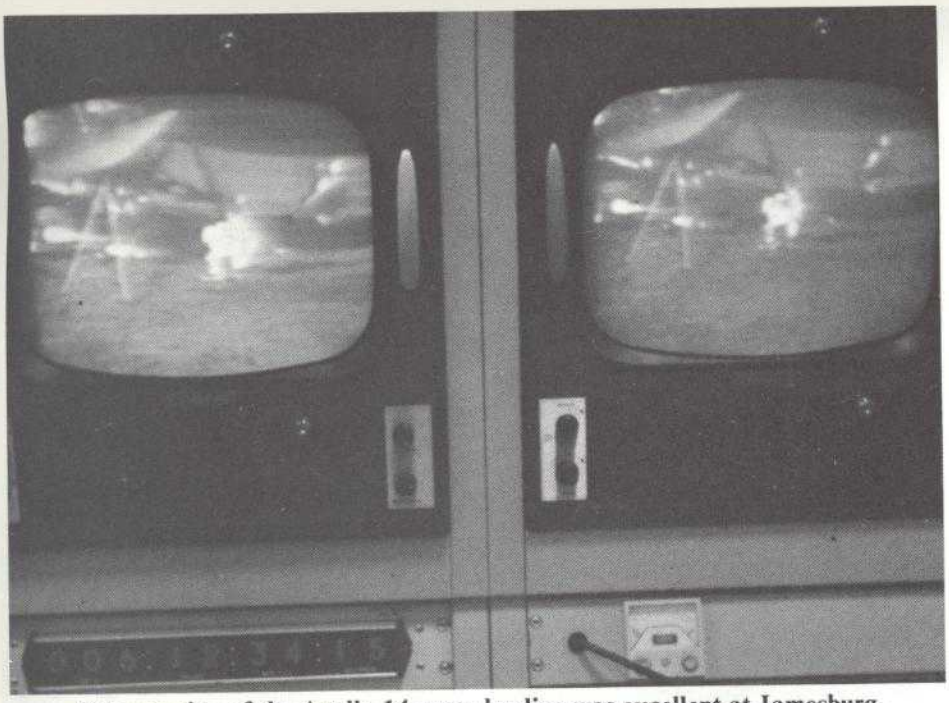
Jim Silvius is now on the air with a 15-watt CW transmitter.

Don Gaston, senior technician, was recently admitted to the local hospital to undergo a series of tests.

French Officials Visit the Labs

Leading officials of the Centre National D'Etudes Spatiales (CNES) visited COMSAT Labs in early March. CNES is the French government organization for space projects. General R. Aubiniere, Director-General of CNES, and Messrs. Lebeau and Charbit, accompanied by R. Serradeil and P. Aubigier of the French Embassy, were given a briefing on the Labs organization and programs by Wilbur L. Pritchard, Labs Director.

Following the briefing, the visitors were taken on a tour of the Labs and shown the DITEC, SPADE and TDMA equipment, the ETL, and work being done on filters and systems simulation. Demonstrations were also provided in the electric power, fuel slosh and circuit board areas. Dr. Burton Edelson, assistant Labs director, was host at a luncheon for the visitors.



TV reception of the Apollo 14 moon landing was excellent at Jamesburg.

At Jamesburg

College Receives Surplus Equipment

By M. Lee Dorsey

Monterey Peninsula College has accepted with gratitude some surplus electronic equipment from Jamesburg. The center rack NMS-63A and three ringer access panels, all declared surplus materials by COMSAT, were picked up by college personnel. It is COMSAT's policy to aid colleges and other institutions of higher learning by donating surplus materials to them.

Vice Admiral Vitzhul Lee and his wife visited the station. He was Commandant of the National War College before he retired.

Twenty VIPs, guests of AT&T from various communities within Marin County, toured the station. These individuals consisted of mayors, city managers, city councilmen, members of the Board of Supervisors and Chamber of Commerce.

Mr. Somlak, a representative of the Thailand Government, visited our station recently. He was accompanied by R. Angle, AT&T.

Twenty-one students of electronics from the Monterey Peninsula College toured the station and were accompanied by G. Eldridge, MPC instructor.

Apollo 14

Television reception at Jamesburg of the Apollo 14 lift-off, moon walk and splashdown was excellent.

WUI representative, Chester George, San Francisco, came to observe the reception of the splashdown video and audio. He remained at Jamesburg until all transmission from the GE transportable aboard the recovery ship, the USS *New Orleans,* was terminated, and he was very pleased with the quality of reception.

Personnel Notes

Milton Branstetter, utility man, resigned to accept a position in Salinas Valley.

Peter Roberts, utility man, joined COMSAT as a temporary employee. Peter, a bachelor, hails from England via Australia and Canada.

Dr. Engel Resigns For University Post

Dr. Joseph H. Engel, COMSAT's Director of Planning Research and Services, has resigned to become chairman of the Department of Systems Engineering at the University of Illinois in Chicago.

Dr. Engel joined COMSAT in 1967 as special assistant to the Vice President-Technical. He was appointed director of planning research and services in 1968.

He said his departure to academic life represents the culmination of a long-felt desire to devote himself to improving the profession of operations research and systems engineering and to help train young people to enter the profession.

Dr. Engel continues to serve as chairman of NATO's Advisory Panel on Operational Research and chairman of the Plans and Programs Committee of the International Federation of Operations Research Societies.

Radiology Experiment Is Conducted

The Bureau of Radiological Health recently conducted experiments in the large anechoic chamber facility at COMSAT Labs to determine power density. The Bureau is actively engaged in the investigation of potentially hazardous electromagnetic fields which may exist in the areas close to FM and TV broadcast antennas.

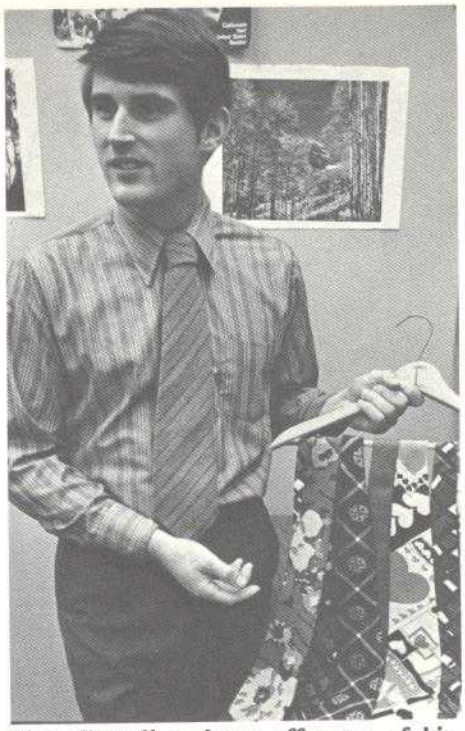
The investigation requires the use of accurately calibrated power density meters in the 100 MHz to 500 MHz frequency band. A critical part of this instrumentation is the antenna or field probe, and the anechoic chamber was used to calibrate these devices.

A characteristic of the antennas utilized for field strength measurement in this frequency range is that they are electrically small. Calibration of the antenna is thus very sensitive to the test range and surroundings. The anechoic chamber provides a nearly reflection-free environment and, consequently, represents an ideal facility for performing accurate calibration measurements.

The Division of Electronic Products of the Bureau of Radiological Health conducted the experiments during the first week of March. Dr. Robert Elder, Director of the Division, requested the use of the facilities, and arrangements were made by Wilbur L. Pritchard, Director of the Labs.

The calibration measurements were performed by members of the radiation measurement and calibration branch of the Division under the direction of Mays Wichord. They were assisted by W. Kreutel and R. Gruner of the antenna branch of the RF Transmission Lab.

Spring may be coming to some parts of the country, but at Andover the snow will be around for some weeks to come.



Rick Cornelius shows off some of his wife's creations.

Notes from Andover

Winter Carnival Is Fun for All

By Joanne Witas

A snow machine parade, with approximately 100 snow machines participating, headed the attractions at the Bethel Winter Carnival. Another attraction was a snow machine safari from Bethel to Mt. Abram, a distance of eight miles, sponsored by the Bethel Snow-Twisters Club. A baked-bean supper, held at the ski lodge, was followed by a dance at the Bethel American Legion Hall; music was furnished by the Brandywine Singers.

Karen Sauret, daughter of Mr. and Mrs. Herman Sauret, facilities engineer, took part in the Eastern Torgle Tokle League Ski Meet held at Salisbury, Connecticut. She was one of the 10 members of the Pineland Ski Club of Andover who took part in the competition. Some members of the Pineland Club came home with top prizes. Karen, just beginning her career, placed sixth among 16 entries in age group 8-9.

On Sunday, March 14, the Pineland Ski Club hosted the USEASA Cross-Country Ski Meet at Andover.

Headquarters and the Labs

Skier Williams Improves His Times

By Eda Boyle

COMSAT has its own daredevil on the ski slopes as long as the eastern ski season lasts. Henry "Downhill Racer" Williams, COMSAT Labs, is in his third season of racing and he claims it gets to be more fun every year.

In his third season of racing, Henry entered four competitions this year and in each entered three events: slalom, giant slalom and downhill. Racing for the Ski Club of Washington, D.C., he has come up with some pretty good times and is going to give somebody some stiff competition next year.

It's Just Blarney

For those who missed their chance this year, keep an eye on George Lawler's office next St. Paddy's Day, when he just might offer the chance once again to kiss the Blarney Stone (Lawler style) for the mere sum of one thin dollar.

Best-Dressed Necks

The best-dressed necks at COMSAT are all tied up these days in original creations by Susan Cornelius, wife of Rick Cornelius, Purchasing. Sue's ties are on display at various Washington area locations.

What? The Corneliuses again? They're in the news with the arrival of their first child, Christopher, born on March 17. St. Patrick must be proud of this one.

Marlene Pamer, former purchasing secretary, and husband Eric are the parents of a boy, John, born January 29.

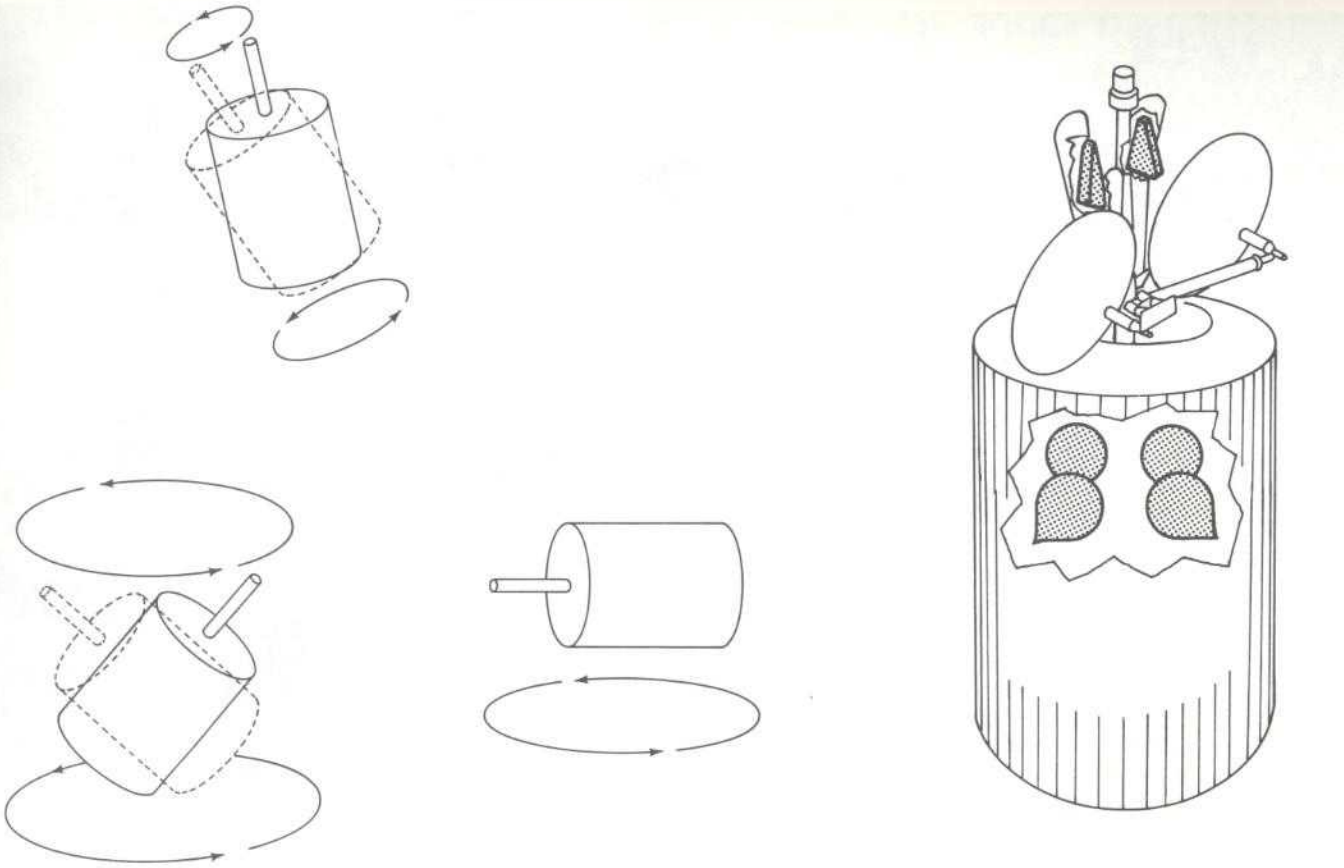
One day later, January 30, another boy, Christopher Michael, was born to Mimi Smith, former personnel secretary, and husband Arthur.

Best wishes to Artie Jacobs, who married Vince Castagnola on February 20.

Wishes for a speedy recovery are offered to Ruth Peed, legal secretary, who is back part-time after a recent operation.

Ice fishing was the sport of the month for several employees. Chuck Lepage, Dave Berry, Merwyn Bartlett, Stan Morse, Dave White and AT&T's Percy Tripp managed to catch 10 landlock salmon in the 2½- to 3½-pound range.

The trip was not complete until Chuck managed to hook the "big one" that got away. Chuck said he would rather not talk about it. The fishing was done at Caribou Lake in the Moosehead region of Maine.



Here, a generalized unstable satellite (A) begins to nutate, (B) rapidly increases its 'coning' movement, (C) enters a flat spin. Between 'A' and 'C', all the spin about the long axis has changed to lateral spin. Try this out with a child's top.

A simplified drawing of INTELSAT IV showing the four fuel tanks in the spinning drum and the two nutation dampers on the despun platform.

The Nutation Damper

Something New Has Been Added to INTELSAT IV

Two triangular contraptions called nutation dampers have made their debut on INTELSAT IV. They are simple, pendulum-like devices, but the reason for their being on the IV's antenna mast is not so simple.

INTELSATs I, II and III were stabilized in orbit by using the principle of the gyroscope; that is, a spinning wheel tends to stay in its original position and resists changes of direction. Children use the same principle when they ride no hands on their bicycles. As in the bicycle wheel, however, most of the weight of the early satellites was concentrated toward the outside of their drumlike bodies. Weightwise, they were more disk than rod. In physics, this is called spin about the maximum moment of inertia axis: a satellite likes to spin with most of its weight as far away from the spin axis as possible.

The accompanying article is another in a COMSAT News series on technical subjects by Information Officer Gerald H. Bidlack.

INTELSAT IV is also spin-stabilized, but the weight distribution has changed. In order to pack so much communications hardware efficiently into a satellite that would fit in the long and slender nose of an Atlas Centaur launch vehicle, more weight was pressed into the center. Now the maximum moment of inertia has become horizontal, and the satellite prefers to spin as a pencil does when it is laid on a table and "twirled" with the fingers. If no preventive measures were taken, a small amount of lateral push at either end of the spacecraft—any slight imbalance would do—would set the satellite "nutating" or wobbling like a lazy top. The wobbling would increase rapidly until the spacecraft entered a flat sideways spin. To operate properly, however, the spacecraft must continue to spin upright. A twirling satellite with its sensitive directional antennas sweeping aimlessly around the universe would be useless.

How the IV Is Arranged

Actually, INTELSAT IV consists of *two* counterrotating bodies, one atop the other. The bottom of the spacecraft, containing the solar cell drum, the apogee motor, fuel tanks, positioning and orientation hardware, and other mechanical components, spins in one direction. The entire communications system, including transponders and antennas, is mounted on the upper body, a platform which "despins" or rotates in the opposite direction at exactly the same speed. A person on earth would see the upper platform stationary and the lower drum rotating—that is how INTELSAT IV's antennas remain fixed on the earth below. The lower drum with its mechanical components obeys the physical laws of spinning bodies. Its maximum moment of inertia is horizontal.

The Idea of "Damping"

In Newtonian physics, any action generates an equal and opposite reaction. If the action and reaction can be made to work against each other, as they do on a non-spinning body, they will cancel each other out. Devices which utilize this principle to cancel unwanted motion are called dampers.

damper applied to a spinning body to neutralize its nutation (nodding) will cause the body to spin smoothly, but about its maximum moment—in the case of the lower drum of INTELSAT IV, a damper will actually help to force the vehicle into a flat spin.

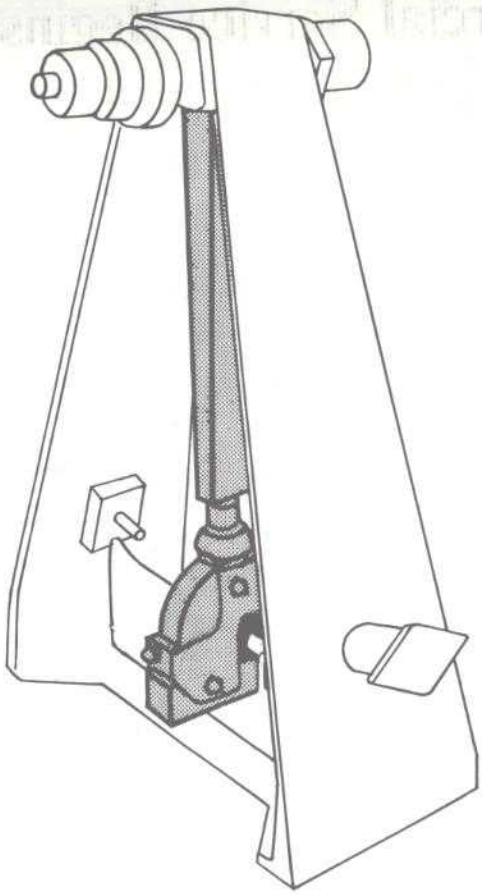
Any part of a satellite set into motion when the spacecraft nutates will act as a damper. The more energetic the motion, the more effective the damping. The most effective and powerful (and unintentional) damper in the spinning drum of INTELSAT IV happens to be the liquid fuel in the four spherical/conical tanks. The problem facing the designers of INTELSAT IV was to find a way to offset the damping effect of sloshing fuel if the big spacecraft should begin to wobble. Their solution was to install dampers on the upper non-spinning platform strong enough to offset what they then thought was the amount of potential fuel slosh.

Calculations, Experiments and Recalculations

Early calculations of the fuel slosh damping on the as yet unbuilt INTELSAT IV spacecraft grossly underestimated the energies expended in sloshing liquids. Late in the INTELSAT IV program—only a few months before launch—engineers at COMSAT Laboratories and at Hughes Aircraft Company discovered through elaborate tests and measurements that bobbing and whirling fuel tanks generate tremendously strong eddies, whirlpools and splashes which might have turned INTELSAT IV on its side in short order.

Modification of IV's Dampers

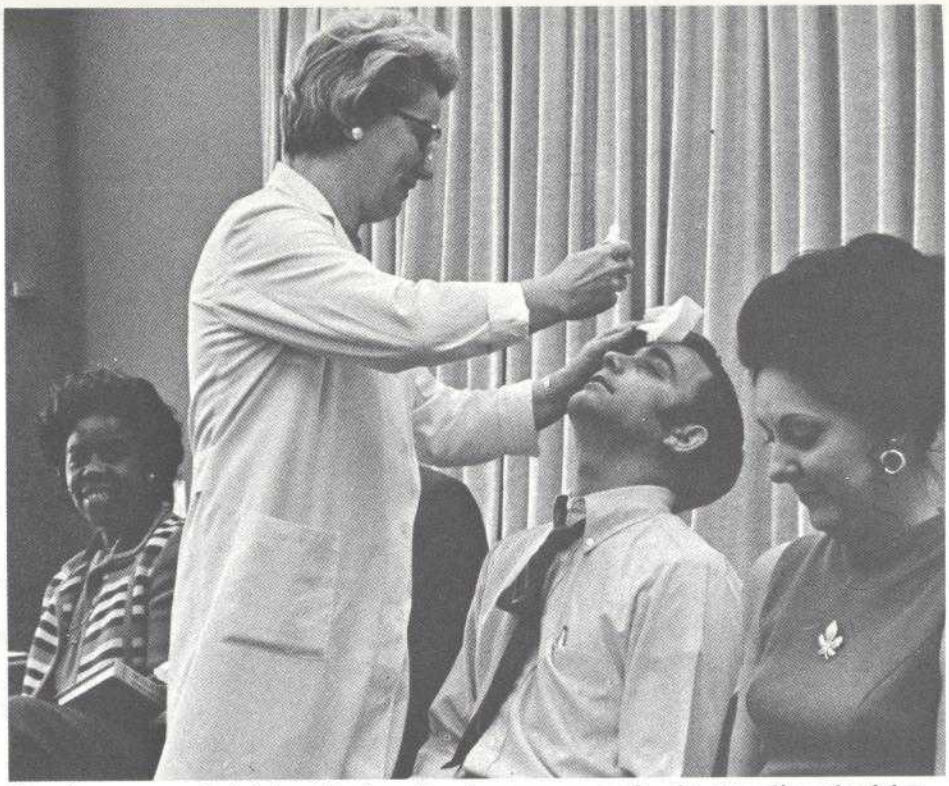
New calculations made by the positioning and orientation branch of COMSAT's Spacecraft Laboratory and by Hughes showed that the two existing dampers (two are used for redundancy in case one fails) were not a sufficient safeguard against nutation. One of the two dampers was modified to provide improved performance in the final operational orbit at the expense of a decrease in its performance during transfer orbit. To assure proper stability during the relatively short, but crucial, transfer orbit stage, a simple computer was installed to detect any nutation and fire the small thrusters to maintain the spacecraft upright. When INTELSAT IV enters the final synchronous orbit in which it operates, any incipient nutation on the part of the spacecraft, which otherwise would be quickly reinforced by the onboard fuel, is now rapidly calmed and nullified by the swinging



An actual nutation damper for INTELSAT IV. The dark area is the pendulum arm. The device is open, just as you see it here.

Ernesto R. Martin, principal COMSAT investigator for the project, and James R. Owens, manager of the positioning and orientation branch, COMSAT Labs, with the spinning device used to simulate the sloshing of fuel on INTELSAT IV.

Visual acuity tests were given as preliminary exams.



Eye drops were administered before the glaucoma exam by the attending physician.

Glaucoma Clinic Is Provided for Plaza Employees

A glaucoma clinic was conducted for the employees at the Plaza on March 16 in conjunction with the Society for the Prevention of Blindness. The Society recommends that persons over 30 be tested for glaucoma annually, glaucoma is a disease evidenced by increased tension in the eyeball which could lead to blindness if not treated. Almost 250 employees took advantage of the free clinic.

Volunteers and staff from the Society administered a visual acuity test, applied eye drops and gave the glaucoma screening test. Of those tested, 18 had at least borderline symptoms and were referred to an optometrist for further tests and treatment.

During April

The BELLCOMM blood drive will be conducted on Friday, April 16, at which time COMSAT employees who were not available to give during the COMSAT drive are asked to do so. In order for COMSAT to continue in the Red Cross Family Blood Plan, Headquarters must donate 46 more pints of blood before June 31.

The Cancer Society has asked for

drive being conducted during April this year. If you are interested in donating your time, contact Hazeline

At COMSAT West

Hughes Gives INTELSAT IV Launch Party

By Dee Wallace

Hughes gave a party in early March to celebrate the successful launch of the first in a series of INTELSAT IV satellites. The party was attended by most of the COMSAT West personnel and their spouses and about 700 Hughes people from the INTELSAT IV program.

Congratulations to Bob and Marilyn Ely, who were married recently in a private chapel ceremony. A cake and champagne reception was attended by several fellow employees.

'Left Right in the Middle'

The opening-night performance of 'Left Right in the Middle', the 1971 satirical review by the Hexagon Club of Washington, will be given on April 15. The production is scheduled for 11 performances by the Hexagon Club, with proceeds going for the benefit of Children's Hospital.

The club, which is headed this year by COMSAT's Jerry Breslow, Assistant Corporate Secretary, hopes to top last year's contribution of $13,000 to the hospital. This is the sixteenth consecutive annual benefit production by the club. In previous years the club has contributed more than $100,000 to various metropolitan charities.

The repertoire of skits and musical sketches for 'Left Right in the Middle' includes spoofs of women's lib, crime in Washington, undercover agents, football, San Clemente, Pat Nixon and Spiro Agnew.

All 11 performances will be given in the Trinity Theatre, 36th and O Streets in Georgetown. Tickets for the benefit performance on Saturday, April 17, are $17.50 and $25.00, which includes a party for cast and audience afterwards.

Other shows (April 16, 22-25 and 29 through May 1) are $3 on Thursday and Sunday and $5 on Friday and Saturday evenings. Matinees are also $3. CEA discounts will be available on all regular performance tickets.

COMSAT NEWS

May 1971

Major Expansion Program Planned For Earth Stations on Both Coasts

East and West Coast earth stations are scheduled to be expanded with the addition of new equipment, including two new antennas, in a major program to increase capacity and redundancy.

COMSAT's Board has approved the expansion program but implementation is subject to approval by the Earth Station Ownership Committee and the FCC.

Without an expansion of present earth station capabilities, a future failure of the Etam or Andover stations on the East Coast, or the Jamesburg station on the West Coast, could lead to substantial interruption of service and loss of revenues. INTELSAT has made provision for space segment backup; to fully protect the system, redundant earth station capability also is required.

Installation Schedule

Under the expansion program, new antennas and related equipment would be installed by 1973 at Etam and Andover. Each earth station would then be capable of handling its own normal load plus restoration capability to fully handle traffic of the other station in the event of failure. At Andover, the proposed antenna would be in addition to the new antenna now being built, which is scheduled to enter commercial operation in the fall of 1971.

On the West Coast, the Brewster station would be expanded by 1972 to handle an additional 433 circuits to provide restoration for all Jamesburg traffic. In addition, some carrier equipment must be added at the Paumalu station.

The Jamesburg station can restore all Brewster traffic without further expansion, utilizing contingency equipment it now has on hand.

Etam Modifications

In addition to these major East and West Coast expansions, the Etam station must undergo some modifications in channel capacity to meet 1972 traffic requirements arising from the entry of new earth stations in additional countries to the Atlantic region network.

Overall, the program, including the modifications this year at Etam, was estimated to cost the joint earth station owners about $11.3 million, of which COMSAT would pay one-half.

Earnings Grow In First Quarter; Dividend Slated

COMSAT reported net income for the first quarter of 1971 of $6,691,000 or 67 cents per share, compared to $3,345,000 or 33 cents per share for the first quarter of 1970.

Operating revenues for the first quarter of 1971 amounted to $21,934,000, an increase of $6,499,000 (42 percent) over the $15,435,000 received in the first quarter of 1970.

The increase in revenues resulted primarily from an overall increase in the number of equivalent half-circuits leased full-time by COMSAT to its customers from 1,566 as of March 31, 1970, to 2,130 as of March 31, 1971.

Approximately $1,200,000 of the increased revenues came from an unexpectedly high volume of temporary service.

Operating expenses for the first quarter of 1971, including income taxes of $4,792,000, amounted to $17,313,000, compared to $13,585,000 for the first quarter of 1970, when income taxes were $1,946,000. Depreciation and amortization expenses accounted for $5,074,000, compared to $5,004,000 for the first quarter of last year.

Net operating income for the first quarter of 1971 totaled $4,621,000, compared to $1,850,000 for the first quarter of last year.

Total other income, after provision for income taxes, was $2,070,000, compared to $1,495,000 in the first quarter of last year, and included approximately $300,000 of extraordinary income from the sale of securities.

The Board of Directors at its April meeting declared a quarterly dividend of 12½ cents on each of the corporation's outstanding shares. The dividend is payable on June 14, 1971, to all shareholders of record as of the close of business on May 14, 1971.

News at a Glance

On the Cover

Sarah Whitley Nicolson, age 9, attended the Annual Meeting for Shareholders, held May 11, 1971, at COMSAT Headquarters in Washington, D.C. Sarah was accompanied by her mother, Mrs. Alice C. Nicolson. They reside in Arlington, Virginia.

May 1971—Year 6, No. 4

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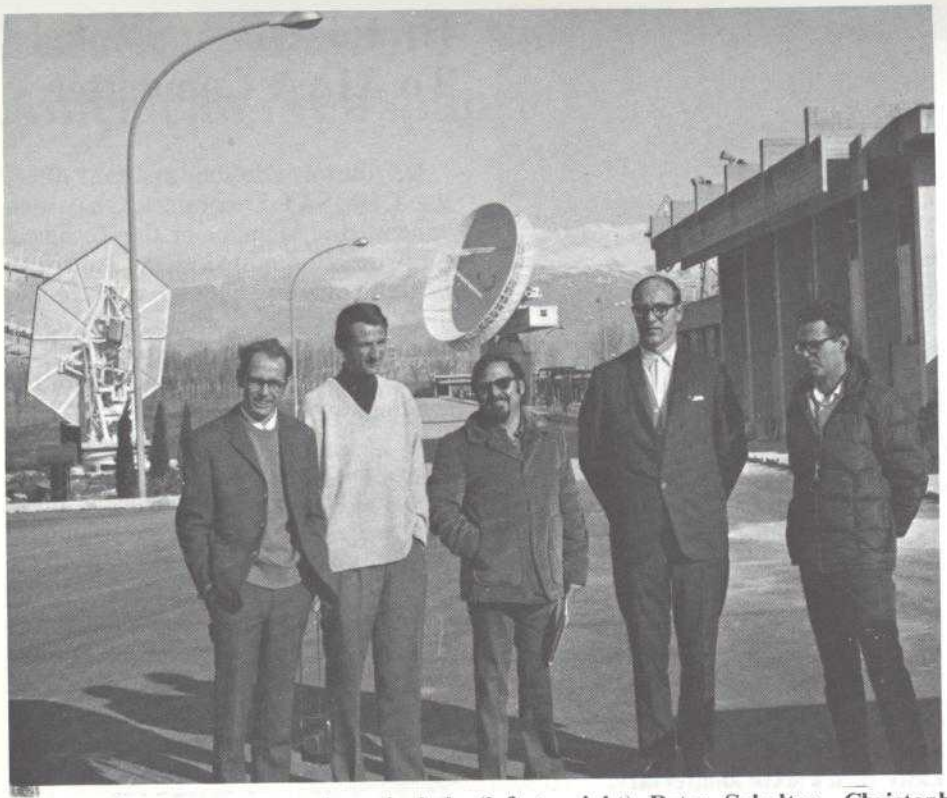
A.V.P. for Public Information
Matthew Gordon
Editor: Kay Smith



Spacecraft test team members include (left to right) Peter Schultze, Christoph Mahle, Simon Bennett, Harry Gross and Arnold Berman. In the center is the Fucino "B" antenna, used for Atlantic traffic, and on the left is an antenna used to receive weather maps from Nimbus satellites.

Fucino Conducts INTELSAT IV Spacecraft Communications Tests

By Simon Bennett

The in-orbit verification of the communications performance of the first INTELSAT IV satellite was conducted by a team of COMSAT engineers using the Fucino Earth Station, near Avezzano, Italy.

After the launch, communications measurements are made to determine that no changes to the communications transponders occurred as a result of the launch, and thus assure that the spacecraft is suitable for commercial use. Similar tests have been performed on every INTELSAT spacecraft.

The satellite was launched on January 25 from Cape Kennedy, Florida, and measurements began on February 6, as the spacecraft rose over the local horizon. Many communications parameters were measured, including effective radiated power, transponder, gain, antenna beam pointing accuracy, frequency response, receiver temperature, and local oscillator frequencies before testing was completed on February 18.

The test team consisted of staff members from various parts of the corporation, and also included one representative from Hughes Aircraft Company and one from NASA. The space segment implementation division was represented by Simon Bennett, who directed the tests, Irving Dostis and Neil White.

COMSAT Labs sent Arnold Berman and Christoph Mahle. Peter Schultze came from the systems engineering division and Harry Gross from Operations. Also assisting were Jim Thompson of Hughes and Bob Pickard from NASA.

Telespazio Helps

In addition to the above, extensive support and cooperation was received from the Telespazio personnel responsible for the operation of the Fucino Earth Station, as well as from the COMSAT telemetry and command personnel at Fucino and at the Spacecraft Technical Control Center in Washington, D.C.

For these measurements the earth station acts as part of the test equipment, and is reconfigured from its normal arrangement by the addition of considerable test equipment. The portions of the earth station used for these tests are the antenna proper, the autotrack system, the transmitter and the low-noise receiver. The remainder of the equipment, needed to generate, detect, calibrate, measure and record the test signals is provided by COMSAT Labs.

Approximately 3,000 pounds of test equipment was sent to Fucino for these tests. This equipment was installed by the test team as close to the antenna feed as practicable, in an arrangement known to result in accurate and repeatable spacecraft performance measurements.

Similar Techniques

The test techniques used to measure the spacecraft parameters are as similar as possible to those used prior to launch so as to facilitate detection of changes in performance. However, the characteristics of earth stations generally differ from those of the test facilities used prior to launch. In addition, the spacecraft's drift across the sky at the rate of 3.5 degrees per day during the test period, caused differences in the test conditions and results.

The test team's task was to evaluate the measurement results, taking these dissimilarities into account. In the case of the IV F-2 spacecraft, the performance was judged to be the same as prior to launch.

(See Fucino Tests the IV, Page 6)

Earth Station Developments

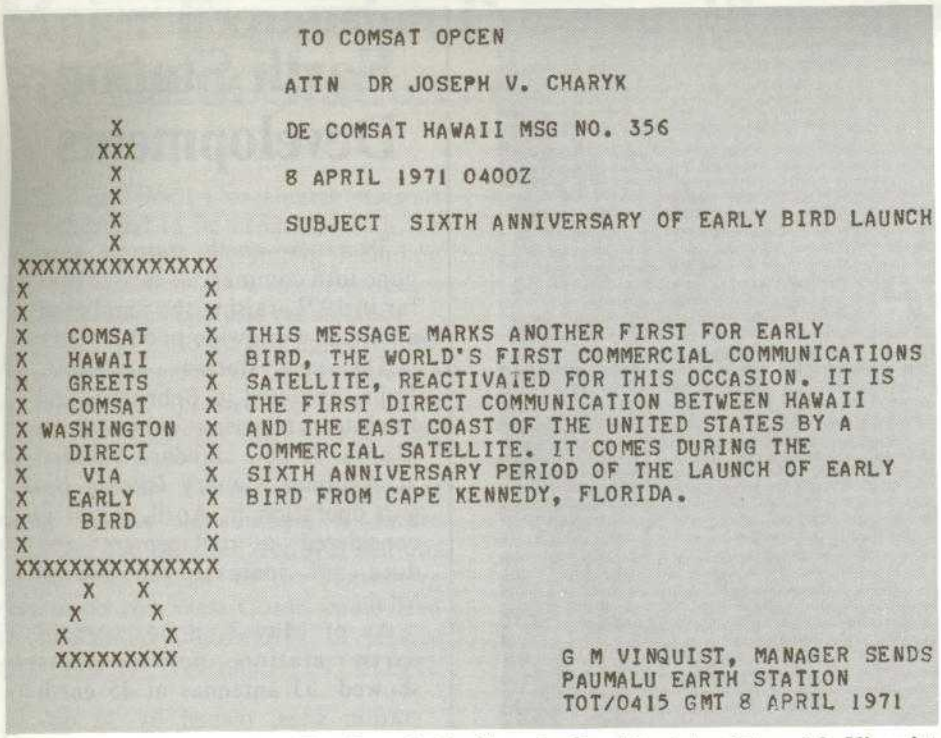
Two new earth stations have gone into commercial service thus far in 1971, raising the number of antennas worldwide to 53.

The new stations are Arvi, India, initiated in February, and Lanlate, Nigeria, initiated in March. A new standard antenna at Aguimes, Canary Islands, began operation in April, but it is considered a replacement and does not increase the overall total.

As of May 1, a boxscore of earth station developments showed: 53 antennas at 45 earth station sites, owned by 32 different countries.

The next station due to go into operation this year is Warkworth, New Zealand. It is scheduled for sometime in May.

By the end of the year, the ground network is expected to consist of 68 antennas at 56 station sites, owned by 42 different countries.



This message was sent to Dr. Joseph V. Charyk, President, by Glenn M. Vinquist, Paumalu station manager, to commemorate Early Bird's sixth anniversary.

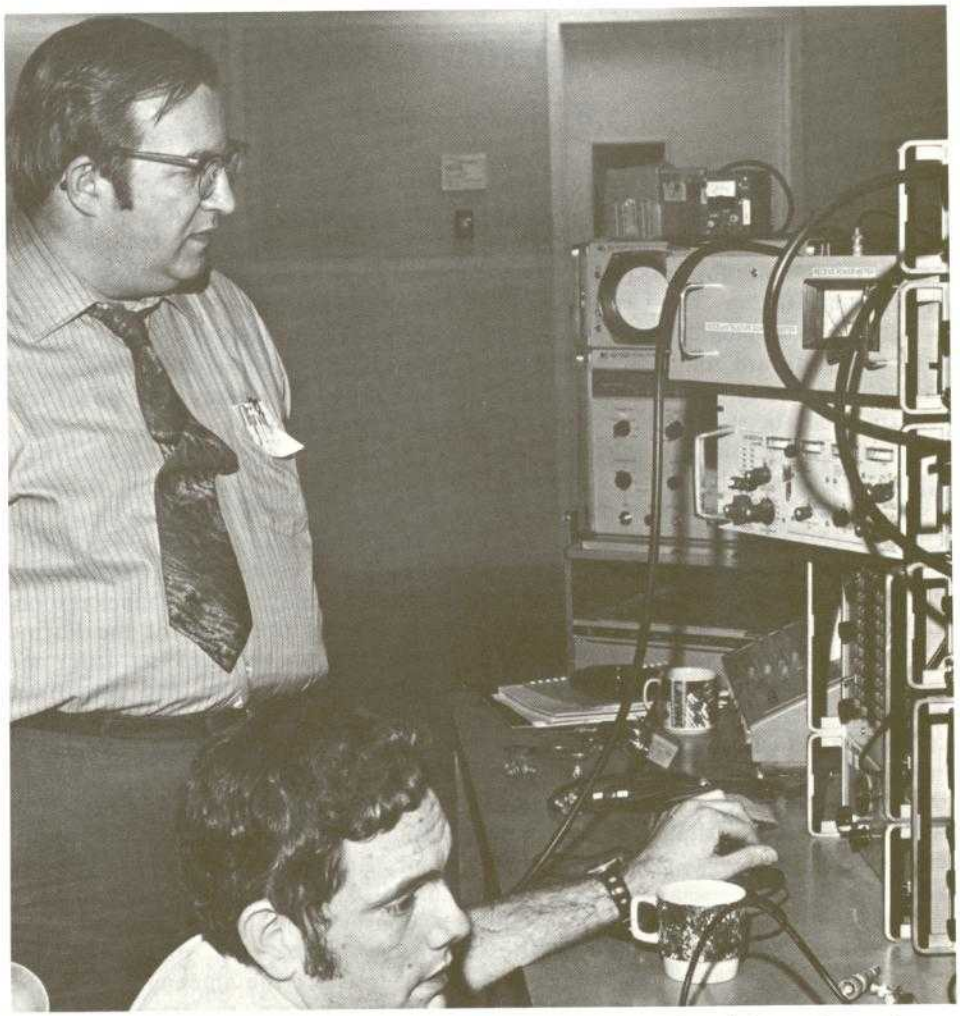
Early Bird Temporarily Reactivated To Link Paumalu With Laboratories

Early Bird, now a venerable six years old, celebrated its April birthday by relaying a pictograph from the COMSAT-operated earth station at Paumalu, Hawaii, to an experimental antenna on the roof of COMSAT Laboratories in Clarksburg, Maryland.

INTELSAT I, better known as Early Bird, was designed to operate for at least 18 months in orbit. It was finally retired after nearly four years of flawless service. Even now, although the satellite has finally run out of station-keeping fuel, its transponders are still in working order.

A torus antenna recently erected on the roof of the Laboratories building was turned into a functional earth station in about 30 hours by Laurence Gray, manager of the earth terminals branch, RF transmission lab. Using parts borrowed from the experimental station at the Plaza, a small *ad hoc* team quickly assembled a receive-only station for the special transmission. Assisting Mr. Gray were Larry Adams, Jack Beyer, Leonard Bonneau, Cal Cotner, Bob Grayson, Bob Greuner, Geoffrey Hyde, Bill Korvin, Ken Pease, Dave Reiser, Norm Schroeder, and Jeffrey Steinhorn.

The torus antenna, which consists of a fixed paraboloidal structure with a movable feed, was already in place as part of the RF transmission lab's reliable earth terminal program.



Dr. Geoffrey Hyde (left) and Cal Cotner test the experimental earth station at COMSAT Labs, which operated with Early Bird.

Dr. Edelson Appointed To AIAA Committee

Dr. Burton Edelson, assistant director, COMSAT Laboratories, has been appointed a Member of the Technical Activities Committee of the American Institute of Aeronautics and Astronautics. This is the senior technical committee of AIAA which directs and coordinates engineering and scientific meetings and other efforts.

Dr. Edelson has been assigned responsibility for three technical areas in which AIAA is engaged: communications, computer and sensor systems.

In his letter of appointment, Dr. Martin Goland, president of AIAA, referred to Edelson's previous experience as chairman of the AIAA Communications Systems Committee. This position was also once held by two other members of COMSAT's technical staff: Wilbur L. Pritchard, Assistant Vice President and Director, COMSAT Labs, and Sidney Metzger, Assistant Vice President-Technical and Chief Engineer.

Satellites Improve Avenues for News, American Newspaper Publishers Told

Matthew Gordon, Assistant Vice President for Public Information, was one of the featured speakers at the American Newspaper Publishers Association (ANPA) annual convention held at the Waldorf-Astoria Hotel in New York, April 19-22. The convention was attended by publishers and executives of newspapers and news media, large and small, throughout the United States.

"News Windows for News Media" was the title of Mr. Gordon's talk in which he explained the development of satellite communications and the changes these developments are bringing to the news world. Panel members in this session were Jules Tewlow, director of special projects, ANPA, and Joseph Lullo, operations supervisor, AT&T. Moderator for the discussion was Eugene C. Dorsey, publisher of the Lansing, Michigan, State Journal.

In the course of his remarks, Mr. Gordon said that Marshall McLuhan, communications theorist, was once quoted as saying "the satellite means among other things the end of news."

"To me," said Mr. Gordon, "it means just the reverse. It means another and important communications capability for increasing and expediting the news flow, internationally and nationally. And this improved communication accents even further the importance of the 'message', and not the method and if anything, makes the importance of the news and the accuracy of the news, more significant than ever before.

At COMSAT we have always characterized the earth stations as windows to the world. And the advancing communication services via satellite offer new windows for the news media."

To illustrate the capabilities of a domestic satellite system, Mr. Gordon said, "We have in sight communication satellites capable of transmitting one billion bits of information, or all the volumes of the Encyclopedia Britannica, across the country in less than one second."

News Publishers Favor COMSAT's Proposal For Domestic System

A domestic satellite communications system may revolutionize the manner in which news will be disseminated in the future, the American Newspaper Publishers Association has told the Federal Communications Commission.

ANPA urged the FCC to make specific provision in any satellite authorization for access by newspapers and news wire services. ANPA said it favors a multipurpose domestic satellite system.

In a letter to the FCC, ANPA President Stanford Smith commented favorably on the pending proposal of COMSAT, saying that it "appears to offer the best prospect for improved service to the press."

Mr. Smith said the satellite system could accelerate adoption of other new technology by the news media, "thus placing within reach new opportunities which challenge the imagination."

The ANPA represents a cross section of newspapers and news executives throughout the United States.

Bartlett Statue Is Presented at Capitol Rotunda

A statue of the late E. L. (Bob) Bartlett, U.S. Senator from the state of Alaska, was presented on behalf of the people of Alaska to the U.S. government in an afternoon ceremony in the Capitol Rotunda on April 27. The sculptured bust of the Senator was unveiled by Mrs. Bartlett.

Dedication comments were made by several persons including Mike Gravel and Ted Stevens, both U.S. Senators from Alaska, Nick Begich, U.S. Representative from Alaska, William A. Egan, Governor of Alaska, and Warren G. Magnuson, U.S. Senator from Washington.

Dr. Joseph V. Charyk, President, and Gus Rauschenbach, director of congressional relations and corporate development, attended the unveiling as COMSAT representatives. The COMSAT earth station at Talkeetna, Alaska, was named after Bob Bartlett at the July 1970 dedication ceremonies, inaugerating commercial satellite communications for the state.

AMSAT Members Test Repeater Breadboard

A breadboard of a linear repeater constructed by amateur radio enthusiasts of the COMSAT Amateur Radio Club was tested in flight the weekend of May 15 in honor of World Telecommunication Day, celebrated worldwide on May 17.

The breadboard is a working model of a repeater system being designed for possible use on the next Radio Amateur Satellite Corporation (AMSAT) spacecraft expected to be launched some time in 1972.

Five Satellites Launched

Five amateur satellites have been launched in the past ten years as piggyback payloads aboard U.S. rockets. The satellites, called Oscar for Orbiting Satellite Carrying Amateur Radio, have been used by radio operators of the COMSAT Amateur Radio Club, and by amateurs in more than 25 countries around the globe.

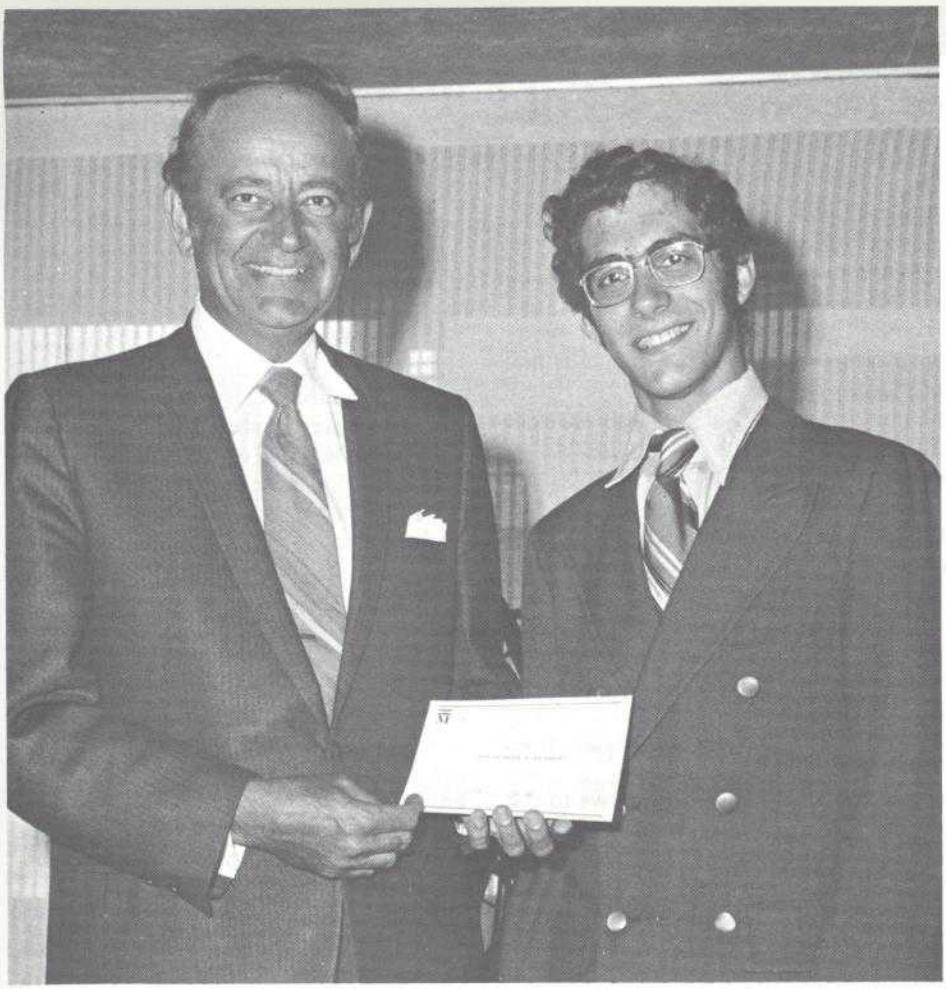
As a part of the preparations for the launch of Oscar-6, AMSAT members from various parts of the U.S. and West Germany have been contributing to the development of the repeater design.

Breadboard Design

Dr. Perry Klein, systems engineering division, Wally Mercer, COMSAT Labs and Karl Meinzer, University of Marburg, Germany, have engineered a working breadboard of the linear repeater, which receives signals in the two-meter amateur band, amplifies them, and retransmits them in the ten-meter band. The repeater has an input center frequency of 145.95 MHz and an output centered at 29.5 MHz.

In order to simulate the operation of the repeater in space, the breadboard was flown from Baltimore to Boston, then on to Chicago before returning to Baltimore. During the two-day flight amateur radio enthusiasts were invited to communicate through the airborne repeater and submit their test findings to the Washington AMSAT headquarters. Results of the testing are still being compiled.

More AMSAT flights are being scheduled for this summer, when prototypes of two other repeaters under development for Oscar-6 will be ready for testing.



Dr. Joseph V. Charyk presents Philip Metzger with the COMSAT scholastic award.

Philip Metzger Awarded Scholarship

This year's winner of the COMSAT scholastic award is Philip Metzger, son of Sidney Metzger, Assistant Vice President-Technical and Chief Engineer. Dr. Joseph V. Charyk, President, awarded the scholarship to Philip on behalf of the corporation in a brief afternoon ceremony on April 29.

A senior at Walter Johnson High School in Bethesda, Philip plans to attend the University of Michigan in Ann Arbor. Presently, he intends to study American history in a prelaw program.

While at Walter Johnson, Philip has taken part in a number of student activities including photography and writing. He is an editor of the school's literary magazine, The Spectator.

Interested in public affairs, Philip has taken part in a number of political campaigns, including the Montgomery County Students for Tydings campaign. Currently, he is the student coordinator for Montgomery County Students for Muskie.

The COMSAT scholarship, offered each year to the son or daughter of a COMSAT employee who obtains the highest total score on the National Merit Scholarship Exam, provides a yearly stipend for four years of undergraduate study.

From Page 3

Fucino Tests the IV

Some earth station characteristics are also measured as part of these tests. At Fucino, the antenna gain and the receiving system effective noise temperature were measured using radio astronomy techniques.

In addition, some new measurement techniques and test equipment set-ups were tried out in an effort to automate future INTELSAT IV spacecraft tests.

Some mechanization of these measurements is desirable because there are 96 signal paths to be measured in the INTELSAT IV communications transponders.

The test results verified that the in-orbit communications performance of the spacecraft was satisfactory for commercial service.

Andover Employees Give Retirement Party

By Joanne Witas

A retirement party was held on Friday, March 26, at the Madison Restaurant for Bob Graham, utility man, who retired recently. Bob was presented with a watch and a sum of money, and Mrs. Graham was given a corsage. Bob has retired from COMSAT, but hasn't given up working—he has a 125-acre farm which he intends to develop further now that he has more time.

Most of the electrical material for the new antenna, as well as the track, is on site. Subcontractors for Philco-Ford are presently completing the pedestal work and installing the electricals. The gear boxes for the elevation drives have arrived and the GT&E sub-reflector has been delivered and stored in the radome.

Congratulations to Bruce Simmons and his wife on the birth of their second child, a boy, born on March 24, weighing 10 pounds 3½ ounces. Also, Jerry Bragdon and his wife celebrate the birth of their first child, a son, born April 12.

Mr. and Mrs. Bob Graham

The last snow machine safari was held on a beautiful day and the conditions were excellent for the 40-mile safari planned by some of the Andover personnel. Dave Durand, Neil Merrill and his son, Greg, from Bethel joined Ralph Summerton, Al Briggs, Ken Dixon and Dave Belanger in Andover. Everyone assembled at Ralph's place for coffee and doughnuts. All the snow machines revved up the East "B" Hill Road toward "C" Pond, where a roaring fire was built. Steaks, home fries and drinks were enjoyed by the hungry adventurers.

The hydramech, a large variable volume pump and reservoir, is moved from the transportable station antenna pedestal to the recently completed building.

2 Publication Groups Visit Headquarters

The Federal Editors Association and the Society of Technical Writers and Publishers held a joint meeting at COMSAT's Plaza Headquarters on April 27. About 70 members and guests of the two organizations saw a screen presentation on COMSAT and INTELSAT in the theater of the Visitors Center, toured the Operations Center, and enjoyed a buffet on the 8th floor overlooking the Potomac River.

Senior Information Officer Al Galfund greeted visitors. Matthew Gordon, Assistant Vice President for Public Information, answered questions for a few minutes after the slide presentation. Larry Covert, manager of the Operations Center, explained how the international system operates. Gus Rauschenbach, Lou Early, and Jerry Bidlack were on hand to answer specific questions for the guests.

ICSC Nominee Returns to England

A *bon voyage* luncheon was given by COMSAT West personnel recently at Lococco's, Manhattan Beach, for the ICSC nominee, Neil While, who returned home to England. Neil was presented with a desk set made by Irv Dostis from a piece of petrified wood as a memento from the U.S.

At Paumalu

Crew Retires Station Equipment That Served Series II Satellites

Despite an early morning downpour (Hawaiian liquid sunshine), the men assigned to the facilities group and the TT&C station, along with several contractor personnel, were out in full force on April 20 to relocate several major items of equipment associated with the Paumalu transportable station.

Two beam power supply units and the hydramech equipment were relocated into a recently completed 14-foot x 25-foot concrete block building near the 42-foot casshorn transportable antenna.

The transportable station was originally installed at Paumalu in 1966 to provide a TT&C facility for the initial INTELSAT II launches as well as back-up for the NASA Apollo communications requirements.

Some of the "old timers" at Paumalu remember that the transportable was to be shipped to Southeast Asia early in 1967. When this concept changed, planning was started towards moving the control equipment into the main station building and relocating the transmitter beam power supplies and antenna drive (hydramech) into a permanent facility. As the present relocation effort was the culmination of over four years planning and effort, it represented a momentous occasion to everyone at Paumalu.

So today, the vans stand empty alongside the sugar-scoop shaped 42-foot antenna overlooking the Pacific, having served five active and useful years of service and leaving behind many memories for the "pioneers" at Paumalu. It had a job to perform and performed it well. The "old timers" will agree that Paumalu will never be the same when the vans are finally moved off the station.

April showers of blessings to the Paul Motoyamas, senior technician, on the birth of a son, and to the Al Prevos, operations supervisor, on the birth of a daughter, both on April 20.

Technical Control Center Succeeds In Maneuvering III F-6 Past the IV

INTELSAT III F-6 recently passed INTELSAT IV on its way to a new orbital position.

Originally at 320 east longitude, the INTELSAT III was being shifted to 340 East, where it can "see" all the earth stations in the Atlantic region to play its role as backup satellite for the new INTELSAT IV and INTELSAT III F-7. In moving eastward over the equator, it approached the position of INTELSAT IV at 335.6 East.

Engineers in COMSAT's Spacecraft Technical Control Center turned the III's directional communications antenna aside as the spacecraft passed through the focused beams of the earth stations using INTELSAT IV. With its antenna oriented normally, the III's live transponders would have begun to relay IV's traffic, causing distortion of the signals received on the ground.

Shortly after the III left the IV's neighborhood, the Control Center turned the antenna's face to the earth again.

The Exacting World of COMSAT Regulatory Attorneys

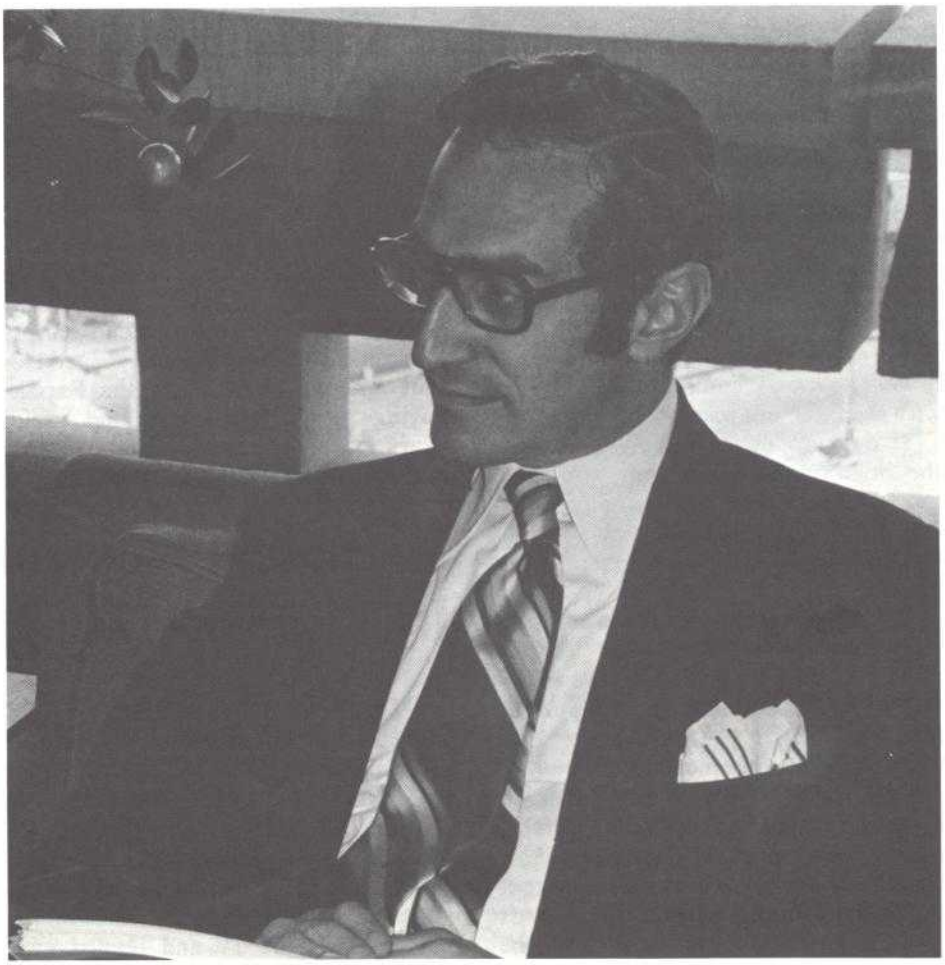
COMSAT's regulatory attorneys primarily act as liaisons between the corporation and the Federal Communications Commission, counseling the corporation on any number of matters that come before the FCC. Under the direction of Larry DeVore, assistant general counsel for regulatory matters, the staff is responsible for the regulatory legal aspects of all corporate activities subject to FCC ruling, including rates and tariffs, accounting principles, applications for construction permits and operating licenses, operating agreements or contracts with other carriers or foreign communications entities.

Staff members assist many other COMSAT personnel in drawing up papers on financial matters, filing fees, construction permits and frequency spectrum use, and represent the corporation in rulemaking and adjudicatory proceedings before the FCC and state regulatory agencies.

The most ambitious project recently undertaken by the regulatory office was the preparation, in conjunction with other corporate officers, of COMSAT's domestic satellite service filings. COMSAT has two proposals before the FCC, one to serve the needs of AT&T in which COMSAT would launch, own and operate three inorbit satellites; the other proposal is for a multipurpose system employing three additional inorbit satellites and the ground station network to serve all other customers. The first round of comments on the original eight major filings was submitted to the FCC on May 12 and a second round is due in June.

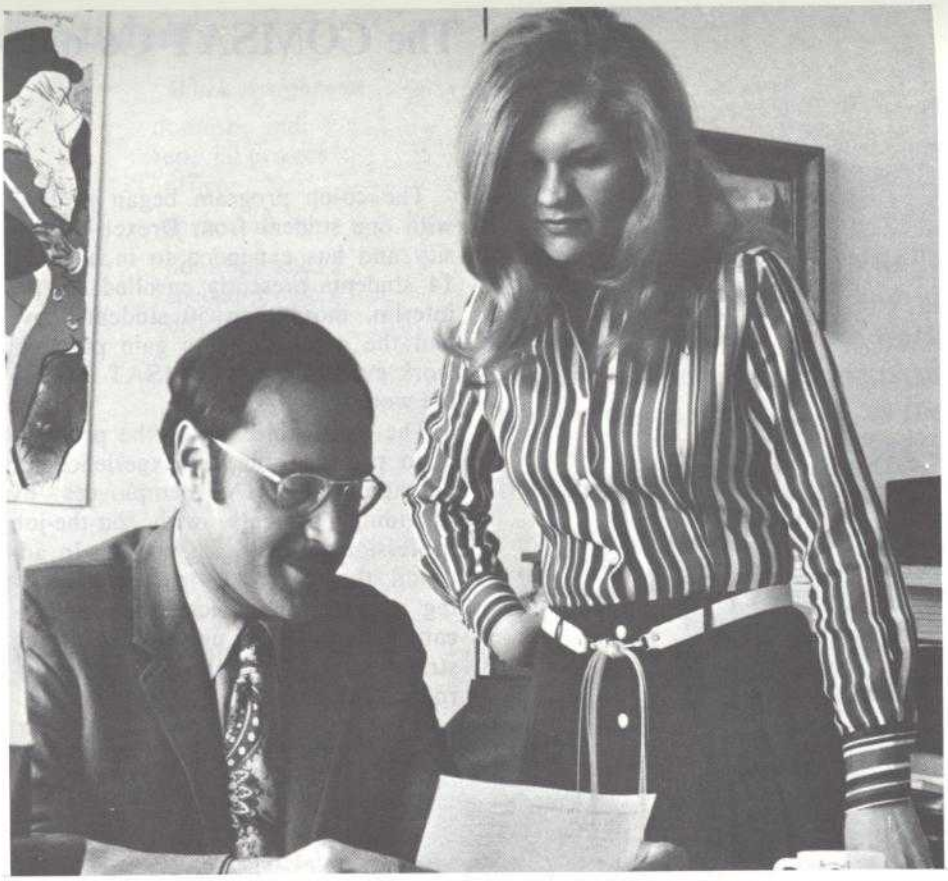
Staff responsibilities also include participation in COMSAT's activities in preparation for the World Administrative Radio Conference (WARC) to be held in Geneva, Switzerland, beginning in June this year; coordination of COMSAT's filings with the FCC and other governmental agencies regarding the cable-satellite and traffic-sharing proceedings now in progress, and the recently reactivated investigation into the level of COMSAT's rates.

Barbara Swaylick, secretary, fields an inquiry about an upcoming filing date.



As assistant general counsel for regulatory matters, Larry Devore keeps his staff on a tight schedule to meet the growing number of filings, comments and papers.

In addition to filings and comments, staff attorneys take on a number of responsibilities, including participation in conferences, earth station activities and satellite launch proceedings.



Besides handling regular staff assignments, Irv Goldstein also acts as executive secretary of the Earth Station Ownership Committee (ESOC). With him is Beverly Nitkowski, secretary.

Jack Hannon has been handling legal filings with the FCC regarding the INTELSAT IV program, including fees for launches and experiments using the satellite. He also concentrates on corporate comments in Alaskan proceedings. Taking dictation is Kitty Stephenson, secretary.

Dennis Brion, who came to the corporation directly from the University of Virginia Law School, views regulation as the law of the future.

The COMSAT Co-ops—Apprentice Professionals

The co-op program began in 1967 with one student from Drexel University and has expanded to include the 14 students presently enrolled. In the interim, more than 50 students have had the opportunity to gain practical work experience at COMSAT through the work-study program.

The main objective of the program is to provide practical experience for potential COMSAT employees by providing students with on-the-job professional work assignments. In addition, the program is part of a growing educational curriculum in American colleges and universities which strives to close the gap between classroom work and fulltime employment.

To date, six colleges and universities have participated jointly in the program with COMSAT. These include the University of Cincinnati, Drexel University, Georgia Institute of Technology, Northeastern University, Virginia Polytechnic Institute and Rensselaer Polytechnic Institute.

The program is operated on a quarterly basis, and generally students work at COMSAT and attend classes in alternate quarters. Students frequently begin their work assignments in their sophomore year and continue throughout their four remaining years of study. All the students to date have been employed in engineering, physics and related fields.

COMSAT participates in the co-op program on a year-round basis. The 14 students in the current program are here during alternate quarters, which in effect means that half of the students are here at any one time. The possibility of expanding the program to include more colleges and universities is being explored.

COMSAT's Co-op Students

Student	*School*	*Work Assignment*
Steve Barley	VPI	domestic and special project office
Ed Bianchi	Drexel	spacecraft lab
Jim Castelon	Drexel	domestic and special projects office
Dan Collier	Georgia Tech	communications processing lab
Richard Crow	Northeastern University	communications processing lab
John Doss	Georgia Tech	spacecraft lab
Charles Dudney	VPI	physics lab
Tom Lynch	University of Cincinnati	RF transmission lab
John Moffett	Georgia Tech	communications processing lab
Dick Neubert	Northeastern University	communications processing lab
Bill Rankin	Drexel	spacecraft lab
Bob Renner	University of Cincinnati	communications processing lab
Mike Robusto	Drexel	domestic and special projects office
Andy Stambaugh	Drexel	RF transmission lab

The co-op students learn while on-the-job at COMSAT, and at the same time perform work assignments as integral units of the professional staff. This is the corporation's fourth year with the program.

The Chairman's Statement To Shareholders

Following are excerpts from the statement of Joseph H. McConnell, Chairman of the Board of Directors, at the Annual Shareholders Meeting on May 11.

• The most significant development of 1970 was the continued growth in use of the global communications satellite system by countries of the world, and more specifically the substantial growth in our own business...our volume of business increased nearly 50 percent. The result was an increase of $22.6 million in gross operating revenues and $8.7 million in net operating income.

This increase in net income from operations enabled the directors to declare the corporation's first dividend of 12½ cents a share last October, and to follow with the same dividend action in each succeeding quarter.

The major communicating countries of the world, however, have largely completed their earth station programs and initial traffic patterns are quite well established. This means that we have entered a period of more normal growth.

• Operating revenues and earnings (for the first quarter 1971) were substantially higher than first quarter 1970, due primarily to a 36 percent increase in the number of half-circuits leased full time by COMSAT from 1,566 to 2,130. The increase for the year 1971, however, will be at a lower rate, perhaps in the order of 20 percent.

• We are presently seeking in the rate case before the FCC to establish a rate of return for the corporation and charges to customers, based on current operating and financial conditions, which will be acceptable to the Commission, and are confident that this matter will be resolved in the best interest of both the public and our shareholders.

• The Commission has ruled that overseas traffic in the Atlantic area be divided on the basis of five satellite circuits for each cable circuit. The Commission has further asked that COMSAT file within 20 days a revised schedule of tariffs for Atlantic service to reflect the economies of the new INTELSAT IV satellite, or submit a statement of reasons why reductions are not yet warranted.

The corporation has always maintained that the use of satellites will result in substantial savings to the public. Both the corporation and the Commission are, therefore, interested in reducing our charges for satellite services consistent with appropriate returns for our shareholders.

Joseph H. McConnell

• While we are on the subject of international communications, I would like to comment briefly on negotiation of the INTELSAT Definitive Arrangements which has now been in progress for more than two years...It is still too early to predict the outcome of these negotiations. But it is COMSAT's objective, as it has been right along, to work for agreements which will foster expansion and improvement of satellite communications to the maximum extent possible, and which will be built on sound economic and management principles.

• We believe that COMSAT best fits the criteria set forth by the White House staff in its guidelines for providing domestic satellite services—that is, free competition among those who have the technical and financial capability. We trust that we can meet the competition. Our record of technical and operating performance speaks for itself. Our retained earnings are at a satisfactory level, and a cash reserve of approximately $100 million gives us a financial posture favorable to debt financing.

• There are still many matters of importance to be resolved. On the other hand, we have established a sound base for continued growth and public service on many fronts, and I have every confidence that our past accomplishments are a prologue to the future.

12 Directors Elected by Shareholders

COMSAT shareholders elected 12 directors at their annual meeting at L'Enfant Plaza on May 11, including a new board member, Gordon Edwards, who is Chairman of the Board and Chief Executive Officer of Kraftco Corporation.

The election of Mr. Edwards as a Series I (public) director increased the public representation on COMSAT's Board to nine, while the number of Series II (carrier) directors decreased to three.

The eight incumbents re-elected as Series I directors were:

- Philip W. Buchen
- Joseph V. Charyk
- William W. Hagerty
- George L. Killion
- Joseph H. McConnell
- James McCormack
- Bruce G. Sundlun
- Leo D. Welch

The three incumbents re-elected as Series II directors were:

- James E. Dingman
- Richard R. Hough
- Horace P. Moulton

In addition, the COMSAT board has three Presidentially-appointed directors:

- Frederic G. Donner
- George Meany
- Rudolph A. Peterson

Following the shareholders meeting, the directors reelected Mr. McConnell as chairman and reelected all officers of the corporation.

Born in Franklin, Va., on May 29, 1907, Mr. Edwards attended Virginia Polytechnic Institute, and received an A.B. degree in Economics from George Washington University in 1931.

Gordon Edwards

The President's Statement To Shareholders

Following are excerpts from the statement of Dr. Joseph V. Charyk, COMSAT President, at the Annual Shareholders Meeting on May 11.

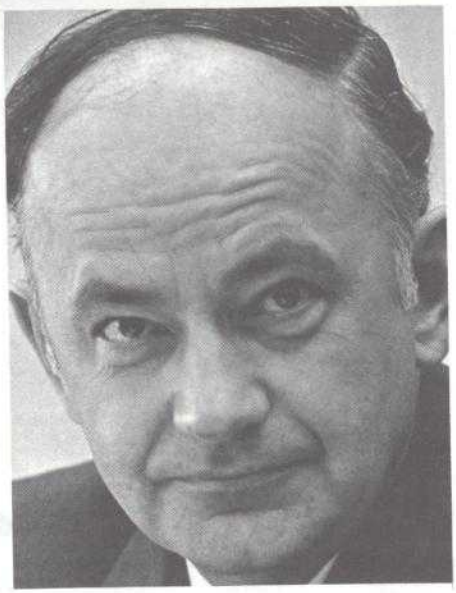
• The single most important event since our meeting last year was the successful launching of the first satellite of the new INTELSAT IV series on January 25, and its subsequent placement in commercial operation over the Atlantic Ocean.

This satellite represents a major step forward in expansion of the communications capacity and efficiency of the global satellite system, and serves as a measure of the potential of high capacity satellites for U.S. domestic service as well.

• The increase in satellite capacity was accompanied by a substantial expansion in the worldwide network of earth stations that work with the satellites. A total of 12 new antennas, at nine earth station sites in eight countries expanded the terrestrial network for satellite communications to 53 antennas at 45 station sites in 32 countries. These earth station facilities now provide more than 140 satellite pathways among 32 countries, and these will grow as additional stations go into operation in substantial numbers during the remainder of this year and next year.

• As a part of our own earth station development program, a new station at Talkeetna, Alaska, went into operation in July 1970, uniting all 50 states by satellite communications for the first time. Construction of a new 97-foot antenna at the Andover, Maine, station is scheduled for completion this summer. A second large antenna is also planned for Andover, and should be ready during the latter part of 1972.

• The significance of the new INTELSAT IV satellite reaches beyond its impact on international communications. Derivatives of this satellite have been proposed by COMSAT as the basis for its two domestic system filings before the Federal Communications Commission. A key modification involved is that of the reuse of the same frequencies through cross polarization techniques developed by COMSAT. This results in an effective doubling of the communications capacity of the satellite.



Dr. Joseph V. Charyk

• Our earth station development work is directed fundamentally toward a two-edged objective of expanding station performance while reducing both construction and operating costs....At the same time, we have been and are continuing investigations into potential uses for smaller and lower cost antennas in the order of 42, 32, and even 16 feet in diameter.

• Extensive research and development is also being carried forward in even more advanced states of satellite and earth station technology, that is, transmission in the higher frequency ranges which will help to shape the future of satellite communications during the decade of the 1980s.

• We have already done a great deal of work on this problem in our Laboratories, and recently received a $2.88 million contract from the National Aeronautics and Space Administration to determine minimum power margins required for advanced communications systems in the 13 and 8 gigahertz bands, and to study the weather interference phenomenon at these frequencies.

• In concluding, however, I would like to leave on a note of cautious optimism. We are in a high risk business. We have experienced an unusual measure of success in achieving our fundamental objective, the establishment of a viable global satellite system, a system with an expanding potential to serve all nations. But, we have also experienced our share of failures, and have our share of problems. We are pioneering a new technology; pushing back new frontiers; doing things that have never been done before. It is inevitable that we will experience additional failures and encounter challenging problems in the future, just as we have in the past. But we also have every confidence that our successes will outweigh our failures, and that we shall achieve satisfactorily the successively higher goals we set for ourselves.

Earth Stations Send Greetings To Shareholders

Live greetings from around the world via satellite were presented to the 1971 Annual Meeting of COMSAT Shareholders on May 11.

Earth stations in several foreign countries and U.S. stations at Cayey, Talkeetna and Paumalu sent greetings to the shareholders' meeting via the satellite system. The earth stations sent their greetings over the regular satellite circuits to the COMSAT operations center, which relayed them to the theatre audience via the public address system.

The demonstration was favorably received by the audience. Mrs. Wilma Soss of New York City, a shareholder, asked COMSAT Chairman Joseph H. McConnell to reply to the earth stations greetings with a message expressing hopes for peace, trade and better communications.

It was Mr. McConnell's first performance as chairman of a COMSAT annual meeting. He drew a compliment from Mrs. Evelyn Y. Davis of New York City for the way he conducted the meeting.

The meeting lasted one hour and forty-two minutes, which was record brevity for a COMSAT annual meeting.

Approximately 200 shareholders and their guests attended the meeting and heard reports by Dr. Joseph V. Charyk and Mr. McConnell. In addition to electing twelve directors, the shareholders reappointed the firm of Haskins & Sells as COMSAT's independent public accountants for another year, and rejected a shareholder proposal by Mrs. Davis, which would have prohibited charitable contributions by the corporation.

A six-minute movie film on the launch of INTELSAT IV, prepared by the information office was shown to shareholders as part of Dr. Charyk's statement.

Athletics Events Enjoy Popularity

Beverly J. Nitkowski

The 1971 CEA board of directors has been most successful in putting together athletic programs, and while all phases of CEA's resources continue to grow, the sports program is growing most rapidly.

For the first time, women were able to play competitive sports with the advent of the "Long Shots", the girls' basketball team. Everyone who participated felt that this was one of the most successful CEA endeavors.

The CEA is continuing its women's physical fitness program this spring with the first women's softball team. "The Swingers," under the direction of Coach Mel Harley and Assistant Coach Ty Ricks, began competitive play in the D.C. recreation league in early May.

The men's fastpitch softball team coached by John DeCaro began the season victoriously. Last year, CEA's "Babe Ruths" were undefeated; the general feeling among team players and coach is that this season will be a repeat performance of last year's triumph.

Meanwhile, back at COMSAT Labs, four mixed softball teams began intramural play the first week of May on the new athletics field. Games are scheduled each Tuesday and Thursday afternoon at 6:00 p.m.

Volleyball is a favorite sport for several Labs members. Anyone interested in trying a serve or two should contact Marty Earl, Ext. 4249.

Three members of COMSAT table tennis club participated in a recent greater Washington area table tennis tournament. Each won two matches in the singles events. Participating were J. Ayoub, J. Kaiser and G. Szarvas.

The club will get official affiliation with the U.S. Table Tennis Association in the near future.

A call for new tennis players was recently made via a CEA information bulletin. If you didn't get the word and would like to take part in ladder play, contact Alan Kasper, Ext. 6142 at the Plaza, or Carl Wenrich, Ext. 4457 at the Labs.

The racket club has scheduled its "get acquainted" Round Robin Mixed Doubles Tournament on May 22 from 11 a.m. until 2 p.m. at East Potomac Park.

The wives of Henry VIII were the subject of a talk given by Mary Lane, computer division, at the University of Maryland. A student of British history, Mrs. Lane centered her talk on the merry king's marital hopscotch.

Spring Plaza Party Held May 14

On May 14, the Plaza lobby and courtyard area was the setting once again for CEA's Spring Plaza Party. "Dancing Under the Stars", the theme of this year's party, was carried out by the music of the "DUST". Cocktails were served beginning at 5:45 p.m.; hot and cold hors d'oeuvres were served.

Highlighting the evening was the crowning of the new "Miss CEA, 1971." She replaces Sandy Brown, who recently left the Corporation. Miss Pat Thompson will reign until "Miss CEA, 1972" is chosen at the Christmas Dinner Dance.

Since the Redskins are already in training, it is not too early to start thinking about Washington's most enjoyed sport. Football is just another phase of the athletics program which has had much participation in the past and hopefully will continue in future seasons. An annual Plaza/Labs game is one of the biggest events of the season.

The board of directors is presently trying to get a bowling team organized for entry in an autumn league. Plans must be made early to guarantee alleys.

Annual CEA Picnic Planned for June 13

CEA's social co-chairmen Kitty Stephenson and Bob Cool have scheduled the 1971 Annual CEA Picnic for Sunday, June 13, at Smokey Glen Farm in Gaithersburg, Md.

Boating Club Buys Mobjack Day Sailor

The boating club is now the proud owner of a Mobjack, a 17-foot open day sailer that can be used for cruising or racing. It is equipped with a spinnaker, an extra sail used to increase speed.

The boat is large enough to accommodate the average family or up to six adults. It will be kept at the Washington Sailing Marina in Slip E-1.

Twenty members of the club contributed to the purchase of the boat, which was partially funded by the CEA. Club members will have priority in the use of the boat, but a schedule will be arranged to accommodate other CEA members.

Approximately 30 COMSAT employees are participating in the Potomac River Power Squadron small-boat handling course sponsored by the Club.

This is the first in a series of articles prepared by the personnel office on employee benefits offered by COMSAT. The personnel office suggests that employees keep the articles for future reference and show them to members of their families.→

George Dill Lectures At IEEE Session

George Dill of the communications processing laboratory spoke recently at the New York City Chapter of the IEEE Professional Group on Communications Technology. His lecture was one of a continuing series of educational lectures sponsored by the New York Education Committee on "Switching Systems and Their Applications".

Mr. Dill's lecture was on "Switching Applications in the Communications Satellite Networks". In the lecture, he described how the application of switching in the communications satellite network is being developed to technically and economically improve the establishment, operation, and maintenance of communication channels between all countries throughout the world. His discussion focused on SPADE, MAT-1 and SDMA.

The lecture was attended by 150 professional engineers and scientists from organizations such as Columbia University, City College of New York, AT&T Long Lines, New York Telephone Company, RCA Globecom, ITT, WUI and other New York industrial organizations.

Classified Ads

Stove Exhaust Hood, copper-color metal Air King hood, 42" wide by 16" deep, built-in light and fan, charcoal filter; uses regular house electrical current, ductless. Bargain, $10, including all mounting screws. Contact Hale Montgomery, Ext. 6100.

Printed Circuit: It's easy to get announcements in the Printed Circuit, a biweekly bulletin for COMSAT employees. Just submit in writing announcements, notices or information of interest to Kay Smith, Room 4128 Plaza, to be included in the next bulletin. The date of the succeeding Printed Circuit will be announced on each bulletin, so you can judge the timing of your article.

For Your Benefit

The corporation has arranged a number of benefit plans in the interest of employee financial security. These programs range from life and hospitalization insurance to government approved Social Security, unemployment and workmen's compensation plans. Also included are a number of personnel policy benefits.

Employee benefits fall into a number of categories. Briefly, the categories and benefit descriptions are as follows:

COMSAT Insurance Plans

The COMSAT insurance program is designed to assist you and your dependents in meeting the financial problems associated with death, illness and/or accidental injury.

The group insurance plans include: life, accidental death and dismemberment and long term disability insurance for you—and medical insurance for you and your family.

Also included is a business air travel insurance plan which provides coverage for you while traveling on COMSAT business and the new voluntary accident insurance plan which provides coverage for you and your dependents in case of accidental death or injury.

Financial Security Plans

To help you meet your financial needs in the years ahead, the corporation has two financial security plans for all regular employees.

The COMSAT thrift and savings plan offers:

- a convenient method of systematic savings via payroll deduction;
- a corporate contribution equivalent to 50 percent of your savings, or $1 for every $2 you save;
- a choice of investment directions and opportunities;
- an opportunity to supplement your active employment income and retirement benefits.

The COMSAT pension plan is fully paid by the corporation. Normal retirement is at age 65. But, early retirement is permitted as early as age 55 depending on several factors including years of accumulated service.

The amount of retirement is determined by the employee's length of service and his highest average earnings for five consecutive years during the last ten years of COMSAT service.

Government - Corporate Cooperative Plans

The Social Security (FICA) Act was passed to help you and your dependents when you reach retirement age. Under the act, both you and COMSAT are taxed on an equal percentage of your gross pay, subject to a maximum specified by law. Social Security benefits are in addition to the retirement benefits you receive under COMSAT's retirement pension plan.

Under provisions of the federal and state compensation laws, COMSAT insures against unemployment. You pay no part of this program. COMSAT pays the entire cost.

Should you become unemployed, for any reason, you should immediately contact the nearest unemployment office where you live. The amount of your unemployment benefits will depend upon your past earnings, your number of dependents, and the conditions by which you became unemployed.

All employees are covered by workmen's compensation insurance, as required by law. The cost of benefits is paid entirely by COMSAT.

Workmen's compensation pays for medical, hospital, and surgical expenses as well as partly reimbursing you for time lost from the occupational illness or accident.

If you should become ill or injured as a result of your job, you must immediately report it to your supervisor. Should you fail to tell your supervisor about an accident or illness and you later suffer complications, you could lose your compensation benefits.

(See Corporate Personnel Policy Benefits, Page 17)

Jamesburg Route Being Repaired

By M. Lee Dorsey

If you remember how long the drive into the Carmel Valley and the Jamesburg station used to be, you'd be dismayed at how much longer it became recently when detours rerouted traffic to permit repairs of the Carmel Valley Road.

The Department of Highways started work on the road just south of the Carmel Valley Village and the Jamesburg station.

During the past two years, many sections of the road have been washed out by seasonal rains. We had been traveling the road on a one-way basis before the repairs and rerouting began. Road work is scheduled to continue for several months, but should provide us and our visitors with more enjoyable travel when complete.

One of the improvements already completed has been the removal of a large tree once located at a sharp turn in the road. The presence of the tree has forced several employees to head for the bank or hills when faced with an oncoming car.

Parties Galore

The JCEA held its first quarterly party recently for employees and guests. The informal gathering was held at the Los Laureles Lodge in Carmel Valley Village. Thirty-six people braved the rain to attend the party, which included food, refreshments and plenty of indoor fun. Everyone especially enjoyed the old player piano and the sing-along.

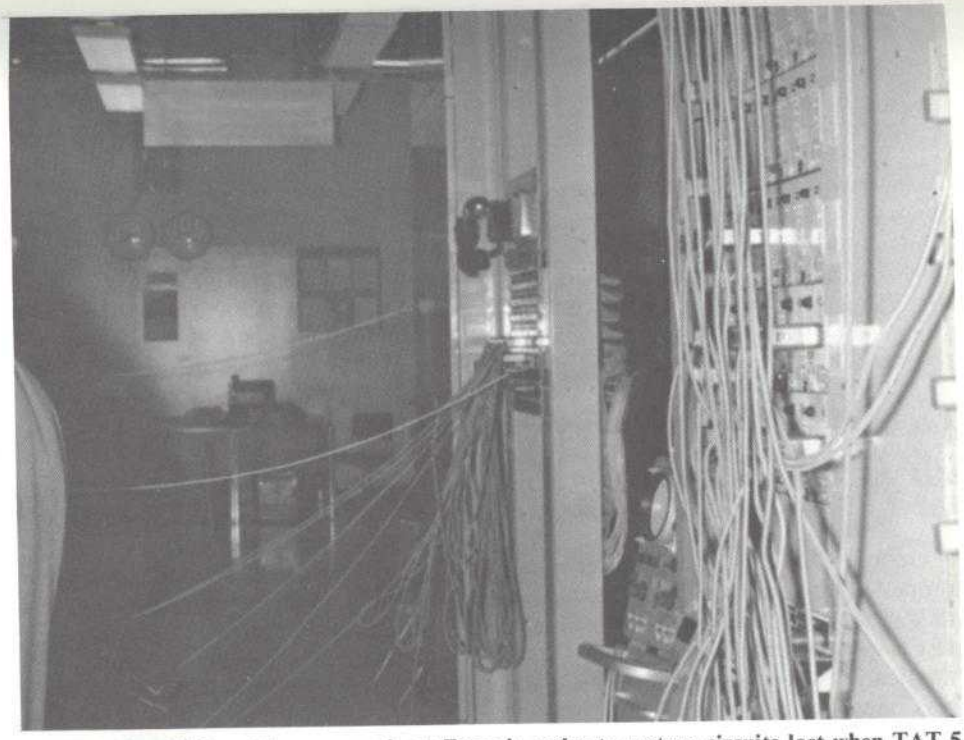
Bill Hartke, senior technician, and his wife, Barbara, celebrated the near-completion of their new home on West Carmel Valley Road by inviting all of the Jamesburg staff to a housewarming party.

The COMSAT, AT&T and A.I.S. wives attended a luncheon held at the Rancho del Monte Country Club in Carmel Valley Village.

The Ladies Luncheon will now be a regularly scheduled event, to be held on the second Wednesday of each month.

Annual Spring Picnic Planned

The JCEA is busy planning the annual picnic for Jamesburg families. A tentative date has been set for June 17 at the Bolardo Park near Hollister.



A multitude of 182 patches was made at Etam in order to restore circuits lost when TAT-5 went out.

At Etam

Cable Outages Cancel Weekend Fun

By Deloris Goodwin

Weekends are made for family fun and hobbies, but not if you are an Etam employee and two Atlantic region cables have just gone our of service.

This happened to us recently, and Etam staff members spent the weekend busily helping restore cable service via the satellite system. We frantically retuned filters, split racks and configured the station to carry the extra load.

When it was all over, the sense of accomplishment outweighed the inconvenience.

Station Test

Marvin Bowser, INTELSAT systems management; John Husted, communications processing laboratory; and Frank Klisch, systems engineering division, were here to conduct a series of broadband data transmission tests. Tests were concluded with very good results.

Marvin Bowser sort of had "old home week" while here. Marv was stationed at Jamesburg before he was transferred to Washington, D.C.

Dr. Robert Barthle, director, U.S. systems management, visited Jamesburg this spring. A dinner party for him was given by station management and their wives at the Carmel Valley Inn. Much interest was expressed in the new COMSAT tie Dr. Barthle wore that was right in fashion with the latest in wide ties.

Meanwhile, spring has come to the "Garden of Etam". April was a mystery. One day we would drive to work in beautiful 80-degree weather and have to snowshoe to work the next.

Hamburger season has resumed once again at Etam. Since the opening of the season three weeks ago, an average of 38 hamburgers have been prepared weekly. Our chef, Chet Randolph, has done a great job cooking all these hamburgers and it would be almost impossible to find a replacement. The facilities personnel are in the process of fencing in a new picnic area, which is located just east of our control building, under an apple tree and a wild cherry tree. Just think how nice it will be to relax and enjoy the environment!

Speaking of the weather, it seems that the high winds got in on the act too. Part of our COMSAT sign near the entrance to the station was blown down recently. We realize it is only spring, and we are anxiously awaiting beautiful summer weather in hopes that the winds and rains stay at a minimum.

Crawford Booth, facilities maintenance supervisor, came upon an eagle recently standing in the highway. They matched eagle eyes and the bird took off with a mighty flapping of wings.

Carl Cooper was promoted recently from technician to senior technician.

The Etam employees held a party on April 16 in the downtown classical discotheque, SADIE'S, in Macomber.

From Brewster

Used Equipment Goes to University

Brewster station has donated its original mazer low-noise receiver to the University of Washington in Seattle. Louis Correos, a technician with the electrical engineering department, accepted the mazer on behalf of the university.

Students from the junior and senior classes of the Brewster High School attended a one-hour computer seminar conducted at the earth station by Ramon Hashberger, operations supervisor.

Two students from the high school are participating in work experience programs at Brewster. Jeff Cook and Tom Weeks are working in the electronics maintenance shop.

Signs of Spring

Spring finally arrived at Brewster in April. Wayne Colpitts reported that a mother bird acted as a harbinger of spring by nestling four eggs in her antenna-perched nest.

Darrell Nelson is planning to participate in the National Trap Shoot competition in Reno, Nevada. Darrell is a frequent winner in many of the state meets in the area.

Personal Notes

Wally Lauterbach treated the staff to lunch recently when he prepared one of his specialities—liver dumplings. The consensus opinion? Delicious.

Dick Eliason returned to work after undergoing minor surgery, and he looks sportier than ever. He, Don Allen and Pete Vaughan are getting about on their new Hodaka motor bikes.

Brewster CEA

A summer picnic is being planned for the Brewster employees to take place in mid-June. Dewey Martin and Jerry Hart are in charge of the 'Day at Alta Lake State Park'.

Gas for Less? You bet. The BCEA has started pumping gas for Brewster employees at a savings of six cents per gallon. Arrangements were made for the purchase of a used gas pump from the Standard Oil dealer in the area. Gas is pumped in the morning and late afternoon, only at the change of shifts. Employees even enjoy the convenience of a charge card system, but the bills have to be paid every two weeks says Imogene Cook, or delinquents might receive nasty stares until they're paid up.

Paula Hayes (left) and Marie Hixon, both of the credit union office, display the certificate authorizing $20,000 insurance per account.

Credit Union Accounts Now Insured

The COMSAT Federal Credit Union received notice from the National Credit Union Administration, an independant government agency, that its accounts are now insured up to $20,000. The credit union applied for this increase in account insurance on the first of this year and received approval in April.

New credit union committee heads were elected at the first meeting of the 1971 board held in April. Jim Kilcoyne heads the staff as president, while Joe Wellington now serves as vice president. Betty Stover assumes the position of secretary. Other board members include Ted Gottry, Sam Scialabba and Bill Kaht.

The credit committee is headed by Joe Wellington; other members of the credit committee are Gene Christensen, Carl Sederquist and Walt Kutrip.

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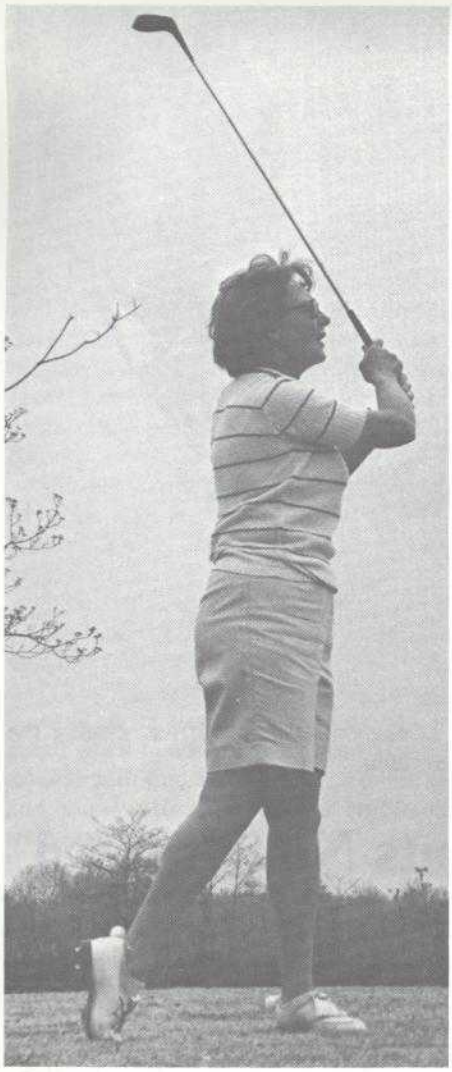
Corporate Personnel Policy Benefits

A list of the numerous personnel policy benefits includes the following:

bereavement leave;
discount purchasing;
disability benefits;
educational assistance (tuition refund);
holidays;
jury duty leave;
leave of absences;
National Merit Scholarship;
personal reason business absences;
membership in professional organizations;
vacation;
free employee parking.

The benefits listed are a complete outline of employee benefits offered by the corporation. In subsequent articles, specific benefits will be discussed in more detail.

The next article will deal with death benefits including the group life and accidental death and dismemberment insurance as well as business air travel and voluntary accident insurance plans. Employees are encouraged to direct questions on these topics to the personnel benefits office, which, in turn, will attempt to answer questions of a general nature in subsequent articles.



Bowser Scores Low Gross to Win CEA's Spring Golf Tournament

The CEA's spring golf tournament at the Washingtonian Golf and Country Club was won by Marvin Bowser, INTELSAT systems management, who shot a low gross of 79 in the gusty winds and drizzle.

Bowser also won the low net and had the longest drive on the 9th hole, a 300-yard "frozen rope" down the center of the fairway.

However, under the CEA's rule of only one prize to a person, the low net trophy was awarded to Dave Burks, also INTELSAT systems management, and the longest drive prize went to Harold Craft, Labs, whose drive was about 10 yards shorter than Bowser's.

Burks, who shot a gross score of 80, has finished second in three of the past four tournaments and first in the other, for the best overall record in the tournaments.

Aside from Bowser, the biggest winner for the day was John Heck, Management Review and Coordination, who gained the envy of all the players by waltzing off with the raffle prize—a matched set of four MacGregor woods. Heck's foursome partners prayed that the new woods would help his game.

The prize for closest to the pin on the difficult par-three 11th hole was won by Dr. Joseph V. Charyk. On a day when most of the players were having trouble keeping tee shots out of the pond in front of the green or making them stick on the hard green, Dr. Charyk coaxed a cunning iron shot to within six feet of the pin.

Second closest was believed to be George Skinner, Finance. With a finesse second only to Dr. Charyk's, Skinner skipped a four-wood shot off the water and into a bank where it popped up in the air and landed about eight feet from the stob.

Flight winners were as follows:

First flight—Larry Weekley, first; Bill Brauer, second.

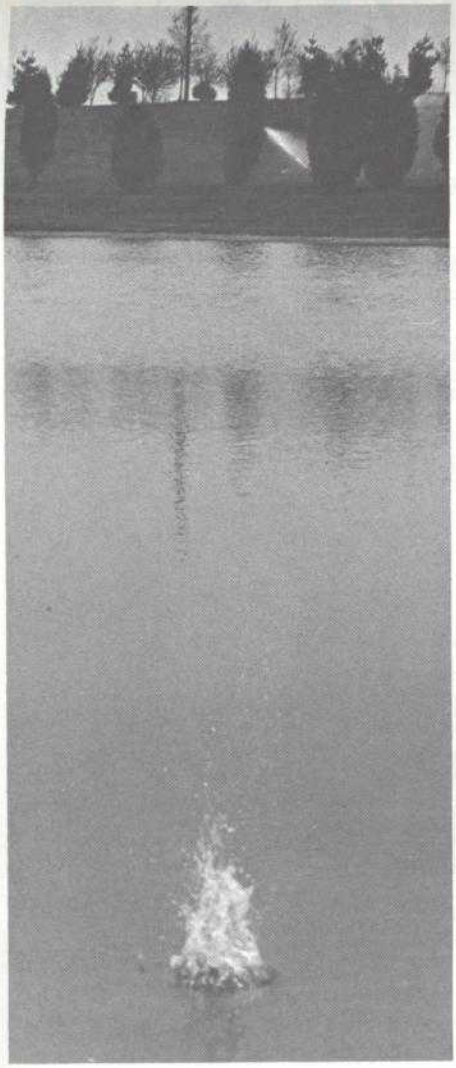
Second flight—Jim Potts, first; Gene Gabbard, second.

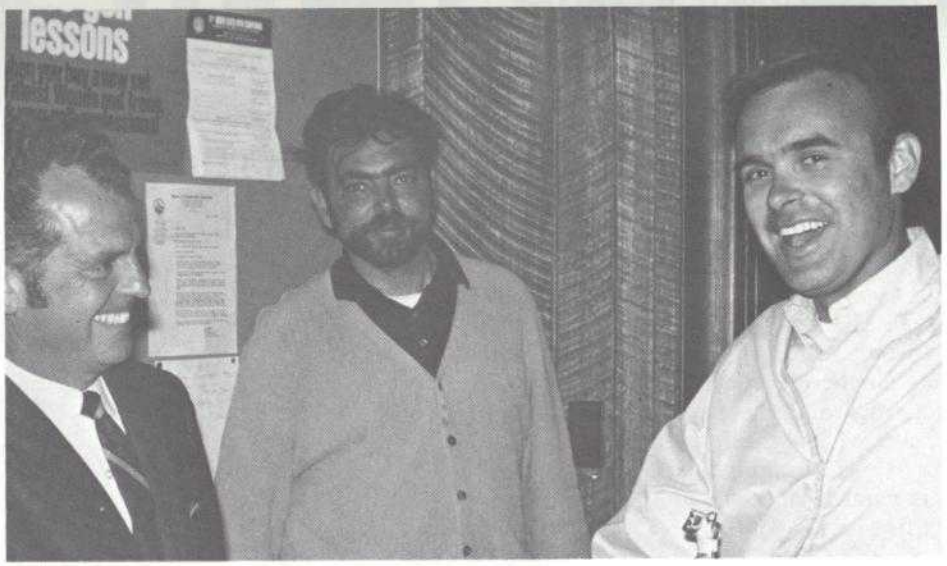
Third flight—Jack Rutter, first; Wayne Christensen, second.

Fourth flight—Tony Buige, first; Wilbert Zarecor, second.

The prizes were golf shirts, except for trophies given for low gross and low net.

More than 80 employees at the Plaza and the Labs participated. Arrangements were handled by Tony Buige, Labs, and Jack Dicks, Plaza.




lessons

Artist's Concept Of IV Launch On Display Here

By Eda Boyle

For one woman's look at the INTELSAT IV launch, stop in Vera Wilson's office on the sixth floor. She has put her recollection of the launch activities and the people involved on canvas. The four foot high oil painting is one of many diverse subjects she has painted since she took up the hobby five years ago.

Some COMSATers are hopping around Europe these days. Pat Kiernan helped to represent COMSAT at the Operations Representatives Meeting in Munich from April 24 to May 1. She then visited other parts of Germany, France and Italy.

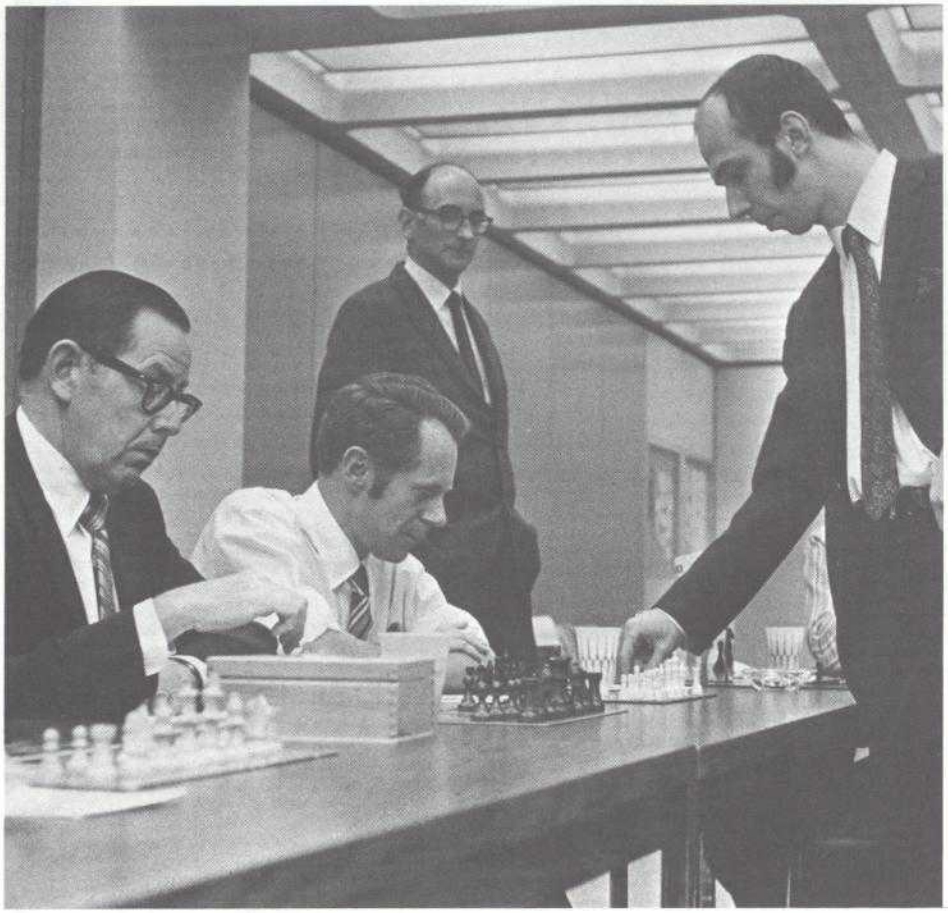
Joyce MeKenzie and her husband left May 6 for a month abroad. They will visit Scotland, England, Spain, Majorca and Portugal.

Glenn Ziegler, assistant supervisor, Plaza mail room, will wed Barbara Rice, who is employed by the Department of Labor, on July 17. Both are from Washington, and the wedding will be at the Incarnation Catholic Church on Eastern Avenue

Vera Wilson displays her painting depicting activities at the INTELSAT IV launch.

A Grandmaster Takes on COMSAT

. . . and wins 17 games



Ed Wright (left) and Jack Dicks challenge Lubomir Kavalek while Bob Strauss studies the moves.

Grandmaster Lubomir Kavalek faced 17 chess players at a simultaneous exhibition held in the Employee Lounge at the Plaza in April. In two hours he had won all 17 games.

Mr. Kavalek, originally of Czechoslovakia, now lives in Washington. A full-time graduate student and teaching fellow at George Washington University, he still finds time to play in major tournaments around the world and to give occasional exhibitions.

Mr. Kavalek is generally recognized as one of the world's top chess experts. Last year he placed first in the international tournament at Caracas. In 1969 he won the North American Continental Open.

This June he will play in a major tournament in Israel. During the summer he will give a series of exhibitions around the United States.

The event at COMSAT was sponsored by the Chess Club. Players from the Plaza and the Labs and a number of guests participated. Jim Shreve, chess club president, acted as host.

After his last opponent had conceded defeat, Mr. Kavalek said, "I hate to be such a brute."