

COMSAT NEWS

December 1971





COMSAT Exhibits at USITA Meeting

More than 6,000 people attended the recent U.S. Independent Telephone Association Convention in New Orleans. COMSAT's exhibit depicted the Corporation's proposed domestic satellite system and allowed visitors to talk over a satellite circuit.

Shown at the left is Bernard Strassburg, Chief, Common Carrier Bureau, FCC, as he tested a satellite circuit. At the right W. C. Mott, Executive Vice President, USITA (left), and G. A. Blake, COMSAT consultant, listen to a taped summary of COMSAT's proposal which has been pending for some time at the FCC.

Via Satellite

VOA Broadcast Mobile Phone Call

A telephone conversation via satellite between a Brazilian telephone executive in his automobile in Brasilia and a Voice of America commentator in Washington was broadcast to Brazil by the VOA on November 6 and 13. The quality of the circuit was described as excellent, despite the complexity of the routing.

From the radiotelephone in his car, Cdr. Cleofas Uchoa, president of "Cotelb", the Brasilia telephone company, placed a call to Prof. John A. Hutchins at the VOA studios in downtown Washington, D. C. The circuit traveled via microwave from Brasilia

to Rio, thence to the Brazilian earth station, thence to the Atlantic INTEL-SAT IV satellite, thence to the Etam earth station, and by land lines to Washington.

Prof. Hutchins said they talked with great clarity for about 10 minutes while Cdr. Uchoa rode around the city. Then the radiotelephone circuit became noisy, and they resumed the conversation the following week when Cdr. Uchoa called from a phone in his office. The two men discussed the satellite system and Brazil's internal communications network, including the outmoded microwave link between Brasilia and Rio, which is due to be replaced with a modern new facility in January.

Advances in transmission and switching facilities have been substantial, and there now is direct dialing from New York to most large, Brazilian cities except Brasilia.

Prof. Hutchins, a professor of Portuguese at the U. S. Naval Academy in Annapolis, conducts a weekly broadcast over VOA to Brazil. His conversation with Cdr. Uchoa was further evidence that dependable voice communications via the satellite system from mobile units to almost any point in the world are possible.

Contract to TRW

COMSAT on behalf of INTELSAT proposes to award a contract to TRW Systems Group, Redondo Beach, California, for a detailed study and analysis of solar cell and coverslide design and manufacturing processes. The proposed study analysis contract in the amount of \$99,927 is to be completed within fourteen months.

The purpose of the study and analysis is to identify areas of significant potential improvement in performance and solar cell array reliability for 10-year missions by satellites in synchronous orbits.

On the Cover: Laura Ann Shubilla, daughter of Stan Shubilla, Finance, has some fun with Santa's Helpers at the annual CEA Christmas Children's Party on Saturday, December 11, at the Feather and Three ballroom, Arlington Virginia. The helpers are (left) Ruth Peed, Legal, and Bert Runfola, Finance. Each of the more than 130 children who attended received a gift, won a prize and had a chance to talk with Santa Claus. More pictures on Page 18.

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for Public Information
James H. Kilcoyne, Jr., Editor

Second Satellite Of IV Series Placed in Orbit

The second launch in the INTEL-SAT IV series was successfully achieved at Cape Kennedy on December 19, and the apogee motor was fired the next day to thrust the satellite into synchronous orbit.

The successful launch followed two delays encountered during December. The first of these resulted from the failure of an Atlas Agena during an Air Force mission on December 4. As a result of that failure, NASA project engineers determined that additional instrumentation should be installed in the first stage of the INTEL-SAT Atlas-Centaur vehicle to verify a satisfactory start cycle before liftoff would be permitted.

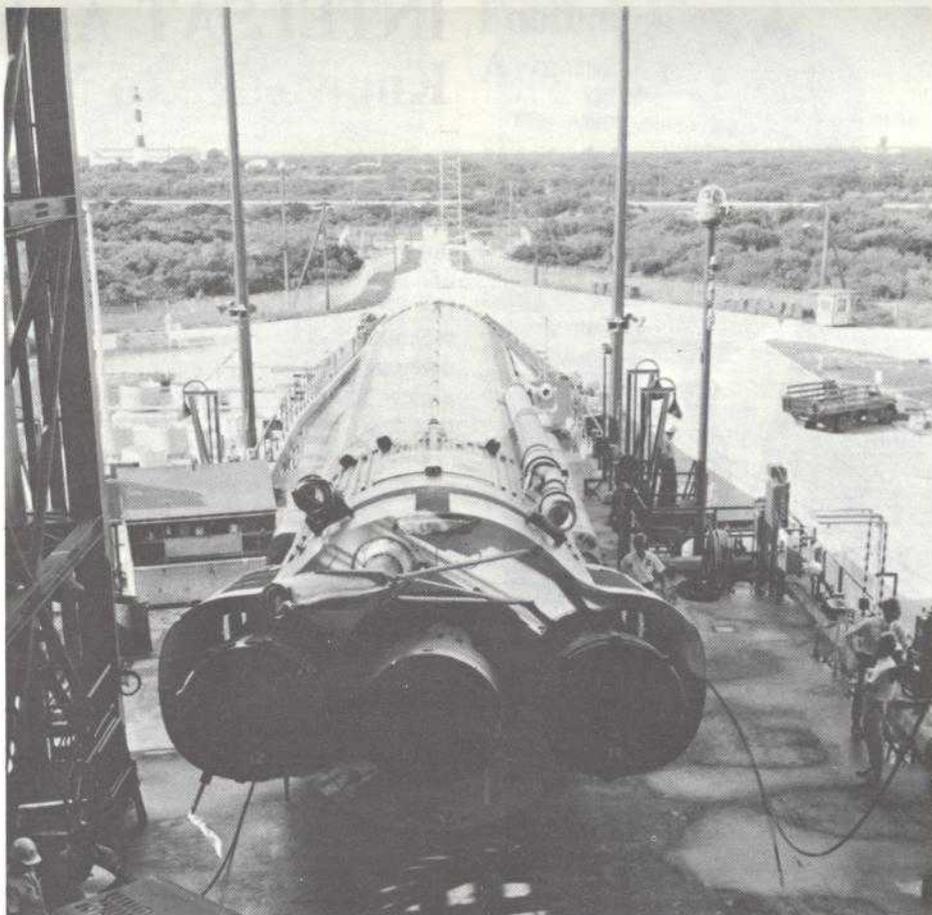
Another postponement occurred during the final countdown on December 18 when high surface winds (up to 30 knots) at Cape Kennedy made it inadvisable to launch that evening.

Earlier, the INTEL-SAT launch had been scheduled for October. It was postponed at that time when a problem was encountered in the quality testing of an electronics package in the autopilot system of the Centaur stage. Throughout preparations for the launch, NASA, the vehicle manufacturer (General Dynamics, Convair Division) and COMSAT have pursued a conservative, cautious course in order to further improve the success probabilities.

The new satellite, INTEL-SAT IV, F-3, is intended for service over the Atlantic Ocean. From its station at 19.5 degrees west Longitude, it could serve any earth station in the Atlantic region except Mexico's, which would have a look-angle of less than 5 degrees. Traffic transition plans provide for the transfer of traffic from the INTEL-SAT III, F-7 to the new satellite. The III, F-7 then will be drifted easterly to serve as a backup for the Indian Ocean satellite.

Initially, the IV, F-3 will serve the U. S., U. K., Canada, France, Trinidad, Jamaica, Morocco, Greece, Ascension and the NASA Atlantic shipboard antenna when it is being used.

Upon becoming the "major path" satellite for the Atlantic region in May 1972, the IV, F-3 will serve traffic between countries having two antennas for Atlantic service plus Ascension and the NASA ship. These countries presently are the U. S. and the U. K.; Argentina will join them in May, fol-



A view of the Atlas-Centaur No. 26 prior to erection on Pad 36A at the Cape

lowed by France, Italy and West Germany.

Other Atlantic region traffic will be served by the INTEL-SAT IV, F-2, which was launched last January. It will be the "primary path" satellite, accessible by all stations in the Atlantic.

As on previous INTEL-SAT missions, NASA will launch the satellite for COMSAT as manager for INTEL-SAT. NASA responsibility ends when the satellite reaches transfer orbit. At that point, COMSAT assumes responsibility for completing the mission.

Based on satellite telemetry data received at the INTEL-SAT tracking stations around the world, COMSAT determines when to fire the apogee motor to insert the satellite into synchronous orbit, performs extensive systems checks, and touches up the orbit prior to placing the satellite into commercial service.

Command and control duties are performed by the Spacecraft Technical Control Center (STCC) at Headquarters.

New STCC Equipment

To increase capability in the STCC, the Corporation is acquiring another small Hewlett-Packard computer to augment the two already in operation there. In addition, one X-Y Record-

er, in addition to the two now there, are being acquired.

This new hardware will greatly increase capability for checking telemetry parameters.

At the present, such data can be computed and displayed in real time for only one satellite at a time. With the new equipment, the STCC will perform frequent limit-checking for all operational satellites and display telemetry parameters for several satellites at a time.

The heavy computer load will continue to be borne by the big IBM 360-65 computer at the Labs. The big computer, accessed through remote terminals at the STCC, performs orbital analysis, derives pointing data, computes maneuvers, analyzes attitude data and does a variety of other analytical programs.

Since the big computer necessarily is down periodically, during non-critical periods, for maintenance and for reprogramming, the new small computers in the STCC will permit continuous monitoring of satellite data. Anyway, monitoring of the satellites—continuous or infrequent—would be inefficient use of the big computer.

A need for the expanded equipment in the STCC has been foreseen for sometime. The equipment will cost about \$150,000 and full installation will be completed this spring.

INTELSAT Assignees Bring Wide Knowledge to Manager's Staff



S. K. Jerath of India.

It was during the second meeting of the then newly-formed ICSC, held in November 1964, that a proposal "to integrate suitably qualified personnel of signatory countries directly into the elements of the Corporation's technical staff" was agreed to by those delegates in attendance. Thus was born a new concept that has continued to this day.

Since that decision was made, 30 assignees representing 11 nations have served as members of the Manager's staff.

The first nominee, F. J. D. Taylor of the United Kingdom, arrived at COMSAT on July 15, 1965. He re-

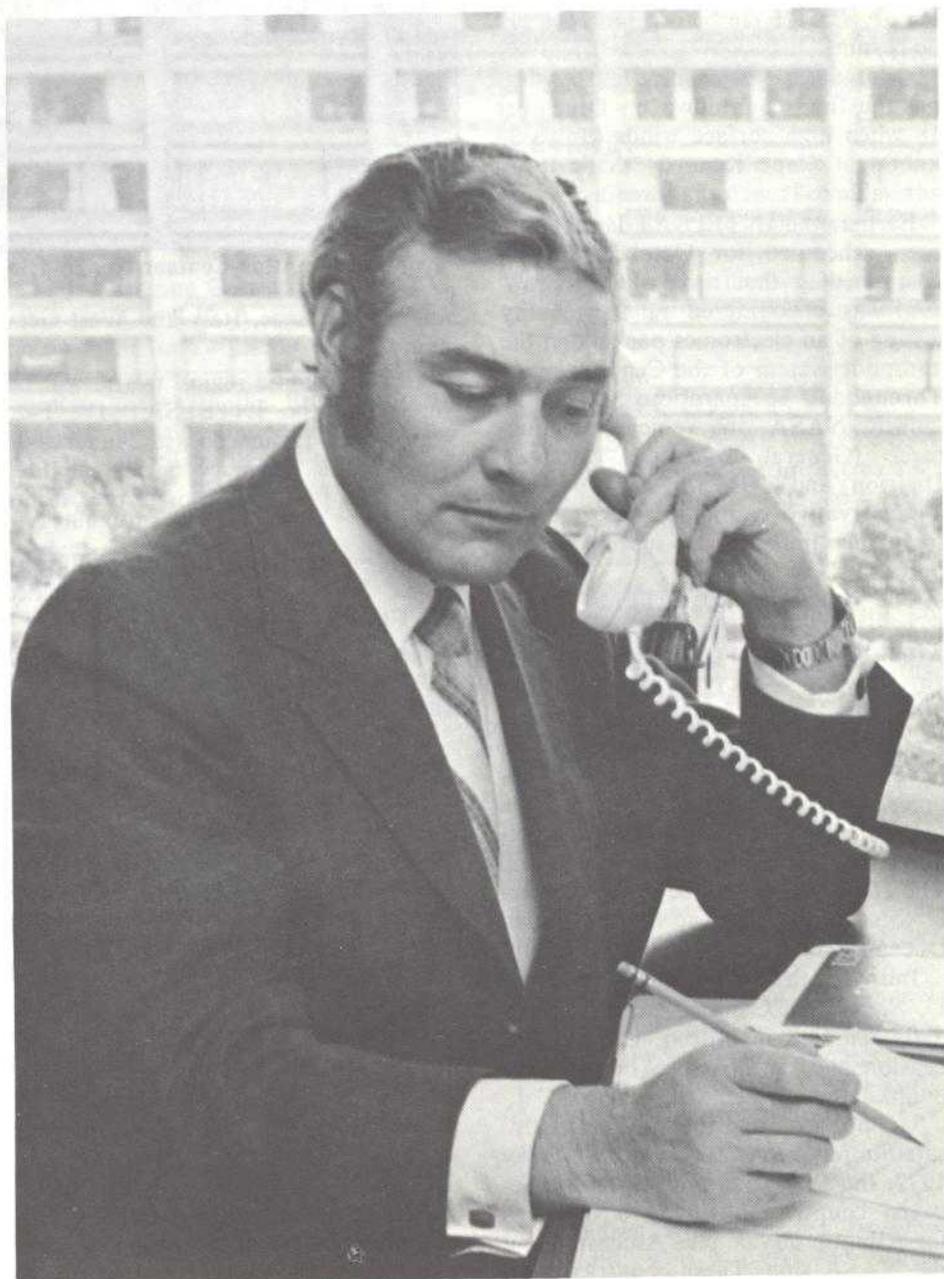
mained a valuable member of the staff until his retirement in July 1971.

Today there are seven INTELSAT assignees working on the Manager's staff. M. A. Bos of the Netherlands, Giampiero Forcina of Italy and Toshio Satoh and Atsushi Tomozawa of Japan are presently at COMSAT Labs. Takeshi Shoji, also of Japan, works with the Headquarters Technical staff. Additionally, G. C. Hall of the United Kingdom is with Operations while S. K. Jerath of India is in Finance.

These men and their predecessors have provided their assistance through the years.



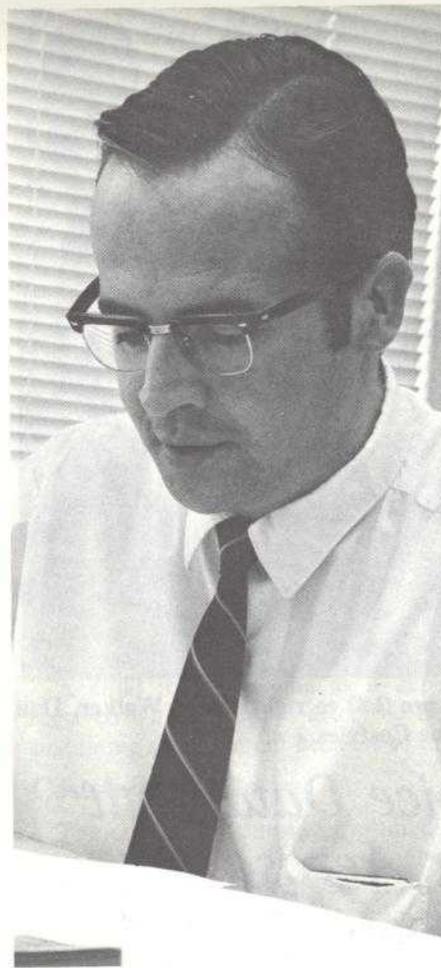
Atsushi Tomozawa of Japan.



Geoffrey C. Hall of the United Kingdom.



Toshio Satoh of Japan.



Marinus A. Bos of the Netherlands.



Giampiero Forcina of Italy.



Takeshi Shoji of Japan.

Football Viewed Around the World

The Army-Navy game and Nebraska's win over Oklahoma were seen by international television viewers around the world during one of the biggest football weekends ever.

These two contests were the highlights of global television service during November as a total of 66 hours of football was received by Europe and the Far East.

For the entire month of November, global television service amounted to 145:55 half-channel hours of transmit time and 190:35 half-channel hours of receive time. This increased the 1971 total through November to 1,362:05 half-channel hours of transmit time and 1,856:27 half-channel hours of receive time.

Full-time circuit utilization of the satellite system by all users amounted to 5,352 equivalent half-circuits at the end of November. COMSAT utilization was 2,281 equivalent half-circuits.

Temporary service during November amounted to 424 half-circuit days, increasing the cumulative total for 1971 to 37,434 half-circuit days.

Graduate Students Tour COMSAT Labs

A group of 30 graduate students from the Technical University of Lyngby, Denmark, recently visited COMSAT Labs. They were guided by Professors Sorensen and Andersen of the university.

The visit was a part of a two-week tour of major U.S. industries and universities sponsored by the Technical University of Denmark.

Dr. Pier L. Bargellini, Senior Staff Scientist at the Labs, acted as host to the visitors.

Temperature Study

COMSAT on behalf of INTELSAT proposes to award a contract to Hawker Siddeley Dynamics, Ltd., Hatfield, Hertfordshire, England, for a design study of an active temperature control system. The proposed contract in the amount of \$80,664 is to be completed within seven months.

The objective of the contract is to determine the applicability and effectiveness of an optimum active temperature control system in treating the thermal problems of a future generation of body stabilized communications satellites.



Members of the team that built the test unit are (left to right) Drew Walker, Dan Fisher, Frank Corcoran, Bart Serafini and Rene Costales.

COMSAT-Built Voice Data Unit Tested in Europe for Aerosat

By S. J. Campanella

A series of tests were performed last September in southwestern France over the Bay of Biscay involving various aspects of voice and data communications and surveillance techniques for possible use in an Aeronautical Satellite Communications System.

The tests were organized by ESRO (European Space Research Organization) and were performed at L-Band frequencies.

The transponders were lofted to an altitude of approximately 40 km (130,000 feet) by means of balloons. The communications tests were performed over a one-way link from the ground to the aircraft via the balloon. The up-link from the ground to the balloon was at 1650 MHz and the down link at 1550 MHz for the voice and data communications experiments.

COMSAT's participation in the experiment was at the invitation of the Department of Transportation (DOT). COMSAT provided a digital voice and data communications system operating at a transmitted bit rate of 18 kilobits/second using four phase PSK modulation. Voice was transmitted by use of a digital feedback delta modulation codec.

This unit was constructed under a

joint effort involving the baseband processing and modulation techniques branch of the Communications Processing Laboratory from June 1 to August 15, 1971.

The COMSAT system was one of three tested and the only one that utilized digital transmission. The other systems tested were a narrowband FM system and a pulse duration modulation system. These were procured by DOT from the Bell Aerospace Company and the Magnavox Company, respectively.

The receive-processing ends of all the systems were installed on-board a Convair 880 flying test-bed which was equipped also with appropriate L-band antennas and receivers. The transmit processing equipment and all systems and the L-band transmitter were located on the ground at Aire-sur-l'Adour in France.

Dan Fisher of the baseband processing branch traveled to France on-board the Convair 880 along with all of the equipment and the other members of the technical support team from government and industry.

After solving a few technical interface problems in France, Mr. Fisher and the DOT project manager Mr. Golab reported that the COMSAT equipment worked very satisfactorily.

A determination of the degree of success achieved will have to await analysis of the data that was recorded on 14



Dan Fisher on site during tests.

magnetic tape channels while in-flight. This analysis was just beginning in November 1971. Once the data is reduced much information needed for the design and specification of an operational AEROSAT system will be available.

The test followed earlier, similar ones conducted in May 1971 near Bakersfield, California, which did not produce satisfactory results. Still earlier, ESRO and CNES (Centre National d'Etudes Spatiales) conducted experiments with air-borne tests near Bordeaux.

The experiments were conducted during periods when there is a lull in the normally high-velocity winds found in the stratosphere so that the balloon remains relatively motionless.

TRW Awarded Study

The TRW Systems Group of Redondo Beach, California, has been awarded a contract by COMSAT on behalf of INTELSAT for study of modulation systems, based on an analytical approach, for possible future satellite communications applications. The \$39,985 contract is to be completed within nine months.

INTELSAT Expands

The Republic of Ghana became the 81st member of INTELSAT on November 15 when Ambassador Ebenezer Moses Debrah signed the Special Agreement.

On December 9, Costa Rica became the 82nd member when Ambassador Rafael Alberto Zuniga deposited the instrument of accession on behalf of his Government and Rodrigo Suarez signed the special agreement for Costa Rica's designated entity.

Dr. Campanella is manager of the baseband processing branch, Communications Processing Laboratory, COMSAT Laboratories.



Bill Mayes (right) accepts the Drazah Ytefas award from Jim Silvius.

Drazah Ytefas Award Stimulates Safety

By Rupard N. Hobbs

Those of you who have been watching the progress of COMSAT over the years will remember the scene as one that can be described as "COMSAT On The Move." We have moved from a single-satellite beginning to the present global system. Even our own Headquarters has moved across town to L'Enfant Plaza and our Labs are located in Clarksburg, Maryland.

So, in keeping with our theme of "COMSAT On The Move," we at Etam have devised an item we call "Drazah Ytefas." The object of the game is to "move the monkey." Drazah Ytefas was created in a safety meeting where it was felt that we had reached a point where additional regulations were not as important as the observation of and compliance with existing ones.

Today this award is made upon a duly noted violation being reported to the safety committee. It displays the name, violation, and time of the offense. To date there have been seven "winners" of the award.

Bill Mayes, who earned the honor most recently, did so in perhaps not an entirely accidental way. He placed a hot soldering iron on Paul Helfgott's new mod "large knot" tie. The ensuing conflagration was reported as a beautiful multi-colored plume of Karate-flavored smoke drifting lazily skyward, casting shimmering effervescent-tinted shadows across the dove gray supervisory console, as the evening sun slowly set in the west of Etam's Green Valley.

Mr. Hobbs is operations supervisor at Etam.

For Your Benefit

COMSAT Benefits Provide Medical Insurance Aid

By Donald J. Chontos and Walter J. Kutrip

This is the fifth in a series of articles prepared by the Personnel office to explain COMSAT's benefits program to employees and their families. Mr. Chontos is manager, employee benefits; Mr. Kutrip is manager, employee services.

The medical insurance plan automatically provides medical insurance protection for all employees as a result of employment. Coverage is also available for "qualified" dependents on a voluntary optional basis.

For insurance purposes, the term "dependent" includes (1) the employee's spouse, and (2) each unmarried child less than 26 years of age, except that a newborn child will not be covered for normal nursery charges.

A child may continue as a dependent after reaching age 26 if due proof is received within 31 days after the 26th birthday that the child is incapable of self-sustaining employment because of mental retardation or physical handicap.

Cost Information

The cost of the employee's "medical insurance" coverage is paid for entirely by COMSAT.

The cost to the employee for "dependent medical insurance" coverage is \$5.45 per pay period (\$5.75 for employees with Hawaiian Medical Service Association coverage). COMSAT pays the remainder of the cost.

Plan Objectives

The objective of COMSAT's medical insurance plan is to assist monetarily COMSAT's employees and their families in meeting costly medical expenses resulting from serious illness or injury or from the accumulation of a number of minor expenses. The emphasis of the plan is directed toward hospital, surgical and major medical expenses that most employees or families can expect to incur from year to year.

There are a number of provisions within the plan to help meet minor medical expenses, however. They include outpatient hospital care, emergency accident care, laboratory and X-ray services and a variety and number of supplies and services covered under the major medical portion of the plan. It must be remembered, however, that there are some medical expenses not covered under the plan and that a number of expenses considered to be of a minor nature are covered only under the major medical part of the plan which pays 80 percent of such expenses after satisfaction of the required deductible. Employees, therefore, may in some cases be required to pay a certain amount of their medical expenses each year before receiving help from the insurance plan.

Plan Composition

The COMSAT medical insurance plan provides hospital, surgical, maternity, in-hospital physician, laboratory and X-ray and emergency accident treatment insurance benefits. It also provides major medical insurance benefits to insure against a catastrophic loss as well as help meet expenses in excess of those reimbursed or not covered by the other insurance coverages.

Medical Insurance Benefits

- Hospital Expenses

All semi-private room and board and special service charges to a maximum of \$1,500 per disability.

Additional charges are covered by major medical insurance without need to satisfy the deductible normally required.

Benefit as prescribed by schedule. Maximum benefit per schedule: \$750.

- Surgical Expenses

COMSAT Benefits Program

- **In-Hospital Physician Expenses**
Additional charges are covered by major medical insurance without need to satisfy the deductible normally required.
1st day: \$18
2nd and 3rd days: \$12
Thereafter: \$6 per day
Maximum benefit: \$720 per disability.
- **Laboratory and X-Ray Expenses**
Maximum of \$50 per accident, or a maximum of \$50 during any six consecutive month period, in connection with one or more diseases or illnesses.
- **Emergency Accident Treatment Expenses**
Maximum of \$25 per accident, or \$50 per calendar year.
- **Maternity Expenses**
Maximum hospital benefit: \$250
Maximum normal obstetrical: \$150
Miscarriage: \$75
- **Major Medical Expenses**
80 percent of all covered hospital and surgical expenses unpaid by the hospital and surgical insurance.
80 percent of all other covered medical expenses after satisfaction of the required deductible.
EXCEPTION: Outpatient psychiatric coverage is limited to a maximum benefit of 50 percent of the actual charges, or \$20 per visit, whichever is less; one visit per day; \$2,000 total benefit in any 12 consecutive months.
Required deductible: 1 percent of base annual salary or \$100 per person, whichever is less. Maximum of two deductibles per family per year.
Maximum lifetime benefit: \$25,000.
- **Personal Insurance Policies**
In accordance with any individual policies carried by the employee.

Special Terms and Provisions

To understand clearly the coverage and benefits available, it is necessary to know and understand the meaning of a number of terms and or provisions applicable to the administration of the plan. These are as follows:

- **Covered Expenses.** These are expenses for which medical and major medical insurance benefits are payable.
- **Reasonable and Customary.** This term means that charges for services do not exceed the general level of charges being made for treatment of similar diseases or injuries.
- **Coordination and Non-duplication of Benefits.** When benefits are payable under more than one group insurance plan, benefits under those plans will be coordinated so that the total benefits under all group plans will not exceed the total covered expenses allowable, or 100 percent of the total expenses, whichever is less.
- **Satisfaction of Deductible.** Normally, an employee or employee's family must pay a certain amount of their medical expenses each year before their major medical insurance becomes effective. The amount of such payments is known as the deductible. The amount of the deductible and details covering its application will be covered in a future article devoted to major medical insurance protection.
- **Benefit Limitations and Exclusion.** The receipt of benefits from the COMSAT medical insurance plan is subject to certain limitations and exclusions. These limitations and exclusions will be described briefly in the Benefit Limitations and Exclusions section of the new Group Insurance Plans booklet which is to be distributed to employees and their families in the near future.

The next article in this series will continue the discussion regarding the Corporation's medical insurance plan.

At Jamesburg

Jury Service Added To Staff's Duties

By M. Lee Dorsey

It looks like jury duty will make a dent in the Jamesburg staff in the coming months. Four of our staff members have received their "Affidavit of Prospective Juror", and Warren Neu, station administrator, is now serving on jury duty. He will be on call for the next two months.

Parties, Parties

The third quarterly JCEA get-together was held at the Los Laureles Lodge on November 15 with 26 persons in attendance.

Turkey, ham, and all the trimmings were enjoyed by the Jamesburg staff and their wives and husbands at the

Mrs. Dorsey is finance-personnel clerk at Jamesburg.

home of station manager John P. Scroggs on Thanksgiving Eve. The Scroggses shared their vacation trip abroad to England, Wales, and Scotland by showing their color slides of the trip.

The JCEA Christmas Party was held on December 17 at the Monterey Elks Club. This year the JCEA went all out. Dinner, refreshments, and a dance band were provided.

Enlarged Menu

Speaking of barbecues, our JCEA President, Bill Hartke, feels we should not be outdone by Etam's hamburger record and Brewster's savory Brunswick stew. Jamesburg's master chef, Al Eleshio, has enlarged his menu. In addition to the regular hamburger, cheeseburger, and steak sandwich fare, he now offers barbecued spare ribs (sauce by Patty Blatnik) and his incomparable charcoaled Cachagua chicken, on alternate weeks.

Personnel

Michael J. Downey, assistant station manager, is on one of his working vacations again. This time he is doing some remodeling to his house.

Facilities engineer, Walter "Robbie" Robinson, took off for Oregon to visit family and friends. Robbie came back with a tale of developing "web feet" while he was away. Seems during a rain storm, he was driving a Volkswagen, which began to take on water. When he would go up a hill, the water would run to the back of the car. When he went down a hill, the water would run to the front of the car. Since

From South America

New Exchange Students Arrive To Begin Year's Work At Labs

By James H. Kilcoyne Jr.

Each works in a different area at COMSAT Labs but each shares the same goal.

During their year's stay with COMSAT, Carlos Lewandowski and Gerardo Mesias hope to improve their knowledge of satellite communications.

Over 40 Nations Participate

Both are being sponsored by the International Association of the Exchange of Students for Technical Experience (IAESTE), which affords students an opportunity to live and work in foreign countries with an emphasis on cultural and technological exchange. The IAESTE program is now in its 23rd year, and approximately 10,000 students from more than 40 countries participate annually.

COMSAT is one of many American firms and universities taking part in

Mr. Kilcoyne is a COMSAT information officer.

the current program. To date, five exchange students have completed their year's work with the Corporation. These include two Swiss students: Armin Friedli and Niklaus Bertschinger, as well as three from the Netherlands: John Rotteveel, Luke Engel and Gert Van Ommering.

Carlos Lewandowski

Mr. Lewandowski and his wife, Grace, of Buenos Aires, arrived in the United States in late September. They stayed with a family living on a farm north of Frederick, Maryland, until recently when they moved into their own apartment in Gaithersburg, Maryland.

Recommended by Carlos A. Killian, current Chairman of the ICSC, Lewandowski received his electronics engineer's degree from the University of Buenos Aires shortly before he arrived in this country.

Expressing special interest in total telecommunications systems applica-

tions, he has been initially assigned to work with George Dill in the telemetry, tracking and command branch, Communications Processing Lab.

Gerardo Mesias

An electronics engineer with a degree from the University of Bogota, Colombia, Gerardo Mesias is the second recent exchange student to join the Labs.

Arriving here in early October he lived with a family in Chevy Chase, Maryland, until he found more permanent housing. Today Mr. Mesias, who is single, shares an apartment with a physicist employed at the National Bureau of Standards.

Mr. Mesias who worked for a year at the Colombian earth station at Choconta is particularly interested in learning more about microwave systems in relation to space communications.

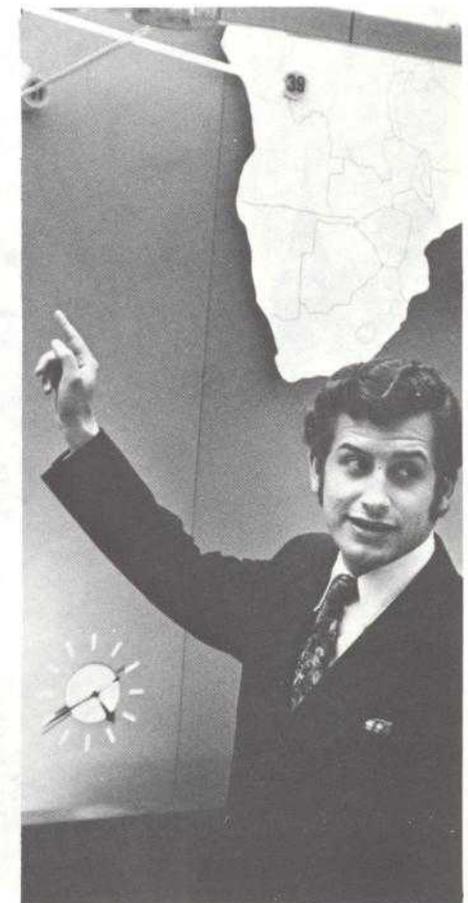
Assigned to work with Laurie Gray in the earth terminal branch of the RF Transmission Lab, he is presently busy with the development of a new demodulator device.

Initial Satisfaction

Both have expressed satisfaction with their new venture at the Labs and are looking to the future.



Carlos Lewandowski at the Operations Center Console.



Gerardo Mesias at the world map.

INTELSAT Secretariat

Provides Threefold Aid to Interim Committee

The INTELSAT Secretariat and the Language Services Department provide a central staff capability and administrative assistance to the ICSC, its Subcommittees and Working Groups.

These highly-trained specialists representing ten national backgrounds are separated into three major functional areas.

The Language Services Department provides simultaneous interpretation into English, French and Spanish during all meetings and furnishes subsequent document translation into these languages.

The Secretariat coordinates arrangements for all ICSC, Subcommittee and Working Group meetings, including those held outside of the United States.

The Administrative Secretary and his staff are responsible for the preparation of the daily meeting summary records and provide administrative assistance to the Chairman and members of the ICSC.



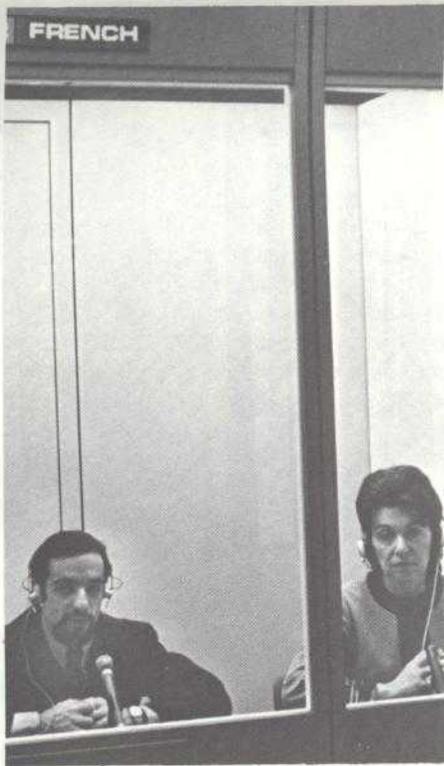
Clerk-typists Danielle Edgell, Nicole Brewitt and Carmen Vazquez (left to right).



Spanish translators Ignacio Siveroni, Gloria Sapia-Bosch, Ismael Dieguez and Henry Massey (left to right).



Fernando van Reigersberg, language department manager, tests a Labs-developed translator unit with Renee Morel.



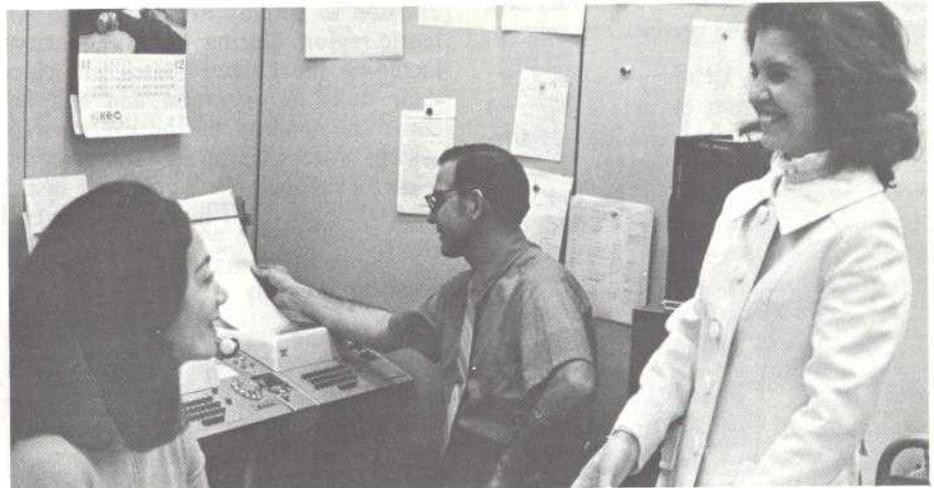
French interpreters Jacques Amar and Madeleine Fishkin.



French translators Francoise Renard, Richard Magee, Nelly Brooks and Nicole Andrews.



Spanish interpreters Carmen Nelson-Sloan and Helga Burrell-Sahl.



Secretariat staff members Norma Shoemaker, Floyd Thompson and Bertha Diaz.



Harry Tollerton, acting administrative secretary, Cathy Byrnes, secretary and Ruth Kupperschlag, conference coordinator, plan a future meeting.

Communications Milestone Achieved As SPADE Is Prepared for Service

By Albert Mark

With the installation of the SPADE terminal at the Etam Earth Station during the past few weeks, a significant milestone has been attained in a program that promises to add an important new dimension to international communications.

Before SPADE, international communications were based on the theory that a firm and substantial requirement had to exist between any two points before a communications link could be established.

The SPADE system opens the door to an entirely new and dynamic communications theory: namely, that if a universal communications capability of high quality is available on instant demand to the users in an international region, then that capability will be sought after and used extensively.

Formalized in 1967

The development of such a demand assignment concept became a formalized project in the INTELSAT R&D program in 1967 as the first steps were taken to create a system to:

- Provide efficient service to light traffic links.
- Handle overflow traffic from medium-capacity pre-assigned links.
- Allow the establishment of a communications link from any earth station to any other earth station within the same zone on demand.
- Utilize satellite capacity efficiently by assigning circuits individually.
- Make optimum use of existing earth station equipment.

Equipment Tested

Circuits were developed, breadboarded, tested, and experimental units were integrated at the COMSAT Labs. These were first operated back-to-back under laboratory conditions and then experimental equipment was tested over satellite links between earth stations at Andover, Maine, Cayey, Puerto Rico, and between Goonhilly (U.K.) and Etam, West Virginia, in 1968 and early 1969.

As system development proceeded, several important characteristics were incorporated in the system, which

came to be known as SPADE. These included:

- A single channel on each RF carrier to allow easy establishment of links on demand.
- Digital coding and modulation for satellite bandwidth conservation.
- Frequency-division multiple-access for efficiency in link connections.
- Carrier on-off for satellite power conservation.
- Autonomous station operation to provide for decentralized control.

Ten Nations in 1972

In April 1970 INTELSAT made the decision to employ SPADE in the Atlantic region. During 1972, ten nations including the United States will place their units in operation and will become the nucleus of the evergrowing system. Altogether more than 30 countries throughout the world will install SPADE equipment in the next several years.

System Design

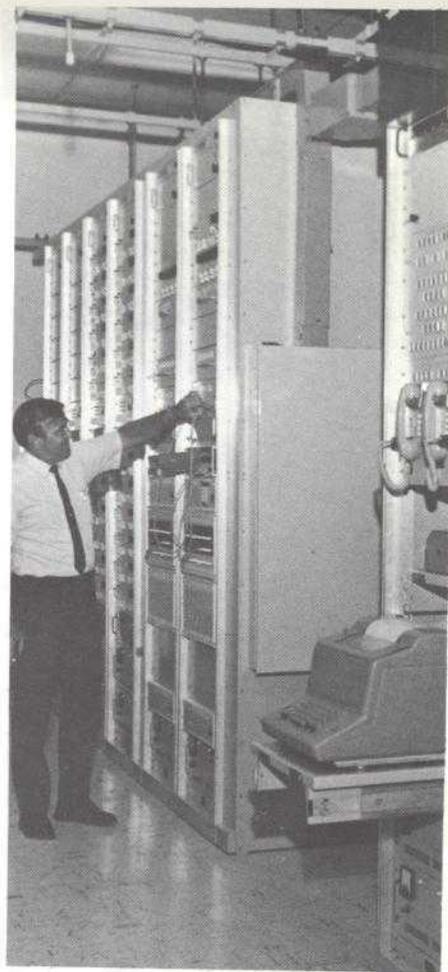
While the system was designed primarily as a demand-assigned voice network, the need for full-time circuits within this common network was foreseen by INTELSAT. A certain number of channels will be assigned for this dedicated type of service and be used for either voice, data, or a combination of voice and data.

The individual PCM channel of the SPADE system can easily accommodate a 48 kilobit data stream. This type of service will become one of the great innovative features of the SPADE network as no equivalent international PCM exists in the world today.

Thus, in addition to the important demand-assigned voice communications role, SPADE will also play an equally important role in the growing international data exchange. This could be of great significance in a time when the huge reservoir of information data banks could be made available to all the countries of the world via satellite data services.

Software Program

COMSAT, on behalf of INTEL-



William Surber, Technical, checks the SPADE test panel.

SAT, is preparing the software program for the SPADE system and will provide this to each member country. Currently, a representative from the German administration is visiting COMSAT Labs and working with computer personnel to define the German administration's interface requirements. As other terminals come into the system, similar arrangements will be made for their terminals.

Central Traffic Recorder

In addition, COMSAT Labs is designing and installing a central traffic recorder for installation at the Etam Earth Station. This recorder will provide traffic statistics for the entire SPADE network. For the first time in communications history, traffic engineering on an international network basis will then become a reality.

New Communications Paths

Ultimately, it is hoped, the new SPADE system will establish many new paths of international communications between the countries of the Atlantic region and will thereby make a significant contribution to improved international understanding.

World's Largest Dishwasher Now Available for Service At Brewster

By Robert E. Sanderson

A dishwasher, possibly the world's largest, is primed and ready to join forces with man against the elements at the Brewster Earth Station.

Each year, Mother Nature deposits approximately 30 inches of snow in the Okanogan country, where it contributes to traffic accidents, backaches and degradation of satellite communications.

As snow accumulates on the surface of the 97-foot-diameter antenna, its attenuation effect on radio signals can increase to the point where communications cannot be maintained between the earth station and the satellite. Brewster's antenna was not equipped

with automatic deicing apparatus; therefore, some means of snow removal had to be developed.

For several years, fair results were obtained by using the station fire pumping trailer to wash the snow from the dish with a mixture of ethylene glycol and water. Major drawbacks to this system were the limited capacity of the mobile fire pump and storage tank, in that the available pressure permitted washing of only the lower third of the reflector, and several refills of the tank were usually required for each washing.

These limitations have been overcome with the installation of a new

high-capacity, permanently located antenna washing system. The new system consists of a 1,000-gallon glycol storage tank, 2,000-gallon mixing tank plumbed to the station water supply, a transfer pump to supply the glycol antifreeze to the mixing tank and a high-volume, high-pressure pump which delivers the mixture through a firehose and nozzle to the antenna surface at 125 gallons per minute and 170 pounds per square inch. The nozzle is mounted on a "monitor" stand, permitting one man to control the direction of the stream.

The glycol-water mixture is controlled during the filling of the mixing tank and proportions are governed by the ambient temperature at the time of the wash. With the glycol content in the wash water, the problem of ice buildup on the antenna backup structure is avoided.

Now that Brewster has the world's biggest dishwasher, one of winter's least pleasant experiences will become a little easier.

Mr. Sanderson is electronic maintenance supervisor at Brewster.

Earth Station Sites in History

By Gerald H. Bidlack

Did You Know That . . .

. . . the Iranian earth station at Asadabad stands near the ancient highway from Babylon to Ecbatana, the capital of the Medes and Persians?

The modern city of Hamadan, built on the ruins of Ecbatana, is 20 miles east of Asadabad in the heart of the Zagros Mountains. Ecbatana was the traditional capital of the Medes, and after the destruction of Nineveh in 612 B.C. it became the center of a major empire in the Middle East.

The Persians under Cyrus the Great rebelled against Median domination. Under Cyrus' successor Darius, the Persian Empire became the largest the world had yet seen, extending from the Caucasus Mountains and the Caspian Sea to the Indian Ocean, and from the Mediterranean to the Indus River of modern Pakistan. It included Egypt, Libya, Turkey, and part of Greece.

To celebrate his accomplishments, Darius ordered the carving of a huge relief on the face of a 2,000-foot cliff along the main road from Babylon at a place called Behistun. The panel, in three languages, measures 100 by 150 feet and begins 300 feet above the ground. Behistun is about 50 miles southwest of Asadabad.

Darius began the construction of a new imperial capital in the south at Persepolis, but Ecbatana, high in the cool mountains, remained the summer royal residence. Persepolis was the site of the lavish convocation of heads of state to mark the 2,500th anniversary of the Empire, and the worldwide television coverage of the event was carried by satellite from the Asadabad earth station.

Ecbatana appears frequently in historical records. The city is mentioned in the Old Testament book of Ezra as well as in several books of the Apocrypha. In 644 A.D. it was conquered by the Arabs. It was destroyed by Mongol invaders in 1220 and later rebuilt. In 1386 the Turkic emperor Tamerlane again destroyed the city; once again it was rebuilt. Modern Hamadan is the burial place of Avicenna, the medieval Persian philosopher and scholar. It is also the legendary burial place of the Biblical Queen Esther and her kinsman Mordecai.

Asadabad is nearly 200 miles west-southwest of Teheran, the modern capital. *Asad* is a common Iranian name; *abad* means a settled place in Farsi. *Georgetown* would be a good analogy in English.

Mr. Bidlack is a COMSAT information officer.



Jerry Hart, facilities mechanic, mans the antenna-wash hose.



Holiday Cheer Arrives at Plaza

By Harriet Biddle

With Thanksgiving turkey under our belts, and Christmas rapidly nearing, there is a note of holiday cheer at the Plaza. Shop owners in the Mall have dressed their windows with special gift attractions. Christmas trees and decorative adornments have sprung up here and there, and secretaries have rummaged through boxes of tinsel and holly to sparkle up the halls.

Broken Bones

Strangely enough, several Plazateers have approached the holiday season on but one good leg. Legs bound up in casts appear to be a new fad around here. Betty Glazer, Corporate Relations, managed to step on a rock the wrong way and has been lugging around a knee-high cast. Winnie Hall, secretary to Sidney Metzger, had one leg in a cast due to a recent foot operation. Her attractive beige bootie was the latest in "cast" fashion.

Carolyn Dredge, Accounting, also had a sad story. She fell down an entire flight of stairs. And that's just the beginning of the minor tragedies which have been occurring in our Accounting Department. Charlotte Barlow has been seen limping about in a cast. Charlotte, like Winnie, also had to endure a foot operation.

Wedding Bells

Here's some more cheerful news. Betty Stover, Legal, became Mrs. Robert Garrison on November 27 at Our Lady of Lourdes Church in Arlington. The wedding was followed by a champagne brunch and Betty was happy that her mother from Omaha, Nebraska, was able to enjoy the ceremony. Betty and Bob are planning to honeymoon at sea.

On November 1, Pat McKinnon, Corporate Relations, was married to Jim Irby. For their honeymoon, Pat and Jim traveled to San Juan, Puerto Rico. While there, they drove out to the Cayey Earth Station where they enjoyed meeting the COMSAT staff as well as taking an interesting tour of the facility.

More good news: Paula Hayes, Credit Union, is expecting her second child in June.

Miss Biddle is a secretary in Management Review and Coordination.



Surender Dhillon as he prepares for his day's activities.

Rheumatoid Arthritis Victim Serves As Programmer for COMSAT

Surender Dhillon regularly performs a wide variety of programming tasks as a contract employee for COMSAT. He is proficient in the use of several computer languages and has taken an active part in the Corporation's recent time-sharing system conversion for use with the IBM 360 computer located at the Labs.

Yet Mr. Dhillon is severely disabled with rheumatoid arthritis and at age 25 faces life confined to a wheelchair. His physical abilities do allow him to feed himself with his one "good hand". He can lift a cup of coffee, write a letter, and even turn the pages of a book. But he is unable to lift himself, easily turn a knob, or move his wheelchair around his apartment.

How then did a person such as Mr. Dhillon become a skilled worker and leave the ranks of the "hopelessly disabled" for the competitive world of the computer programmer?

The task, finding competitive work for severely disabled persons who are homebound, began in Washington, D. C., three years ago under a research grant from HEW's Social and Rehabilitation Service. Today, this work is being conducted by the Research and Training Center at George Washington University, Mr. Dhillon's sponsor.

The project's principal investigator, Thomas R. Shworles, himself a quadriplegic since birth, states that "some of the most severely disabled homebound persons can be trained for employment." Thus far, 25 severely disabled persons including Mr. Dhillon have worked 25,000 hours at an average salary of almost \$4.00 an hour. Their employers include the registrars of a college and a university engineering school, several small bookkeeping

and accounting houses, the National Academy of Science, the Chesapeake and Potomac Telephone Company, the Census Bureau and COMSAT.

As part of his earlier training Mr. Dhillon completed a correspondence course in electronics and passed a high school equivalency test. He was referred to the Training Center by the District of Columbia Department of Vocational Rehabilitation. After an evaluation of his talents by the center's staff, it was determined that he had the aptitudes and interests suitable for a programmer.

Using terminal equipment placed in his home and connected with a computer located elsewhere in the city, he learned two computer languages in two months.

It was about this time that Gerry Embry, Manager, Scientific Applications office in the Computer Division, initiated COMSAT's first 100-hour contract with Mr. Dhillon for his programming services. His training period was very brief, and within a few weeks he had not only converted but significantly improved a "quota determination" program for Finance and Administration.

Since then he has converted and written many programs and routines currently being used within the Corporation. These programs and routines range from those dealing with the propagation of electromagnetic radiation through waveguides to those allowing easy updating of large data bases from remote terminals.

As the initial contract was extremely satisfactory, several renewals have been made. At this time, Mr. Dhillon currently averages 30 to 50 hours of work per month for COMSAT.

Staff Receives Bomb Training

By Deloris Goodwin

Sergeant Morris and Specialist Nash of the 145th Army Bomb Disposal Company, Manor, Pennsylvania, presented their bomb and sabotage course to all Etam employees in mid-November. The course was a very interesting one and gave us an awareness of the many dangers created by any "mad bombers" who may be lurking about.

Potpourri

Seventy-six hamburgers were prepared at Etam on November 3. This was a new record! The snow began to fall here in November and, therefore the hamburger season for the rest of the year doesn't appear promising either for the "Chef" or the partakers.

William Blizzard of the Charleston Newspaper Agency Corporation visited Etam on November 4 to prepare a feature story for the Charleston, West Virginia, Sunday newspaper. He was briefed on the functions of the station, the staff, and the organization of COMSAT and INTELSAT by William B. Carroll, station manager.

Personnel

Mr. and Mrs. Robert Leard and son, Robert, traveled to Grissom Air Force Base, Indiana, to spend Thanksgiving with their daughter and family.

Several COMSAT personnel enjoyed their "beer party" held at the "Satellite" Inn on November 5.

Roger Parsons, station engineer, arranged a party for station personnel and their wives at the Pizza Pub at Deep Creek, Maryland. The pitchers of beer and pizza disappeared much faster than do the repair reports from the maintenance shop. Those who attended found the evening to be most enjoyable.

Dr. W. Cannon of West Virginia University and seven electrical engineering students were recently given a tour of the station.

Headquarters and Labs personnel visiting Etam during the past month included Messrs. Richard McClure, George Dill, Andrew Werth, Drew Walker, Alan Dohne, Wallace Mercer, David Coombs, Norman Cloud, Alfred Donahoe and William Surber.

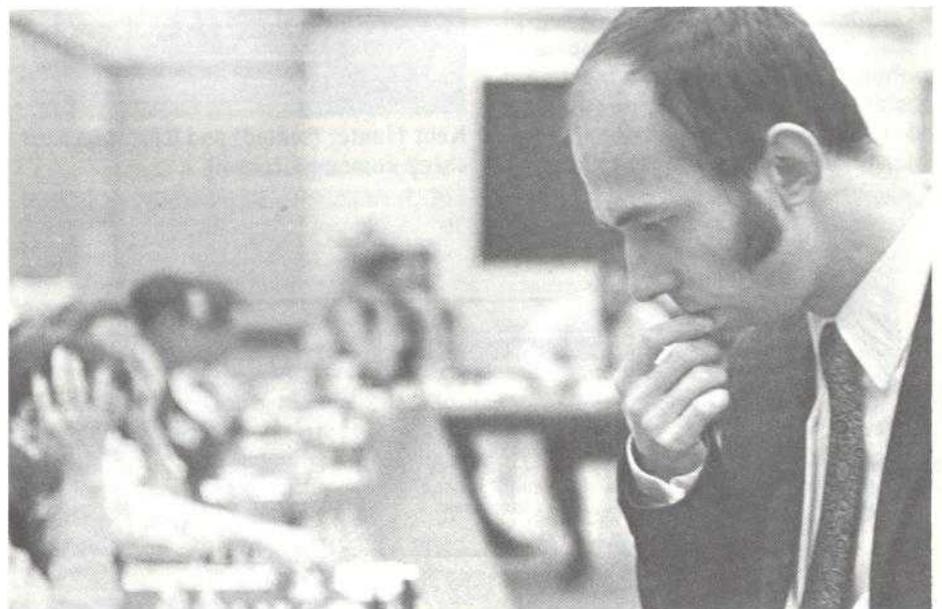
Mrs. Goodwin is accounting and personnel clerk at Etam.



COMSAT Director Speaks to Chamber

Dr. William W. Hagerty, President, Drexel University, Philadelphia, Pa., and a member of COMSAT's Board of Directors, is shown as he addressed the Montgomery County, Maryland, Chamber of Commerce on November 16. Seated with Dr. Hagerty is Glen Solomon, a member of the Chamber.

Dr. Hagerty's comments dealt with "The State of Technology Today" and particularly with Drexel's cooperative student program with industry and current attitude towards engineering education.



Kavalek Plays World Champion

Chess grandmaster Lubomir Kavalek, who visited COMSAT earlier this year for a simultaneous exhibition with the COMSAT Chess Club, played to a draw with World Champion Boris Spassky of the U.S.S.R. in the Canadian Open Championship in early September. Spassky went on to win the tournament.

The world title is up for grabs next spring when Bobby Fischer of the U.S. meets Spassky in a championship match.

Mr. Kavalek, formerly of Czechoslovakia, now lives in Washington. In addition to his chess activities, he is an employee of the Voice of America and a graduate student at George Washington University.

In the photo above, Kavalek ponders a move during his exhibition at COMSAT.

Specialized Ground Stations

Paumalu Performs TT&C Functions, Provides Continuous Satellite Data

An essential element in the successful operation of the global system are specialized ground stations which perform tracking, telemetry and command (TT&C) duties and maintain a continuous check on the satellites in the system.

The functions of these TT&C stations include:

- tracking of satellites during and after launch.
- provision of information on satellite performance and status.
- transmission of commands to change the position of a satellite or switch on communications equipment.
- measuring the communications characteristics of RF carriers retransmitted through satellite transponders.

The four stations providing this information are situated adjacent to the commercial earth stations at Andover, Maine; Carnarvon, Australia; Fucino, Italy; and Paumalu, Hawaii.

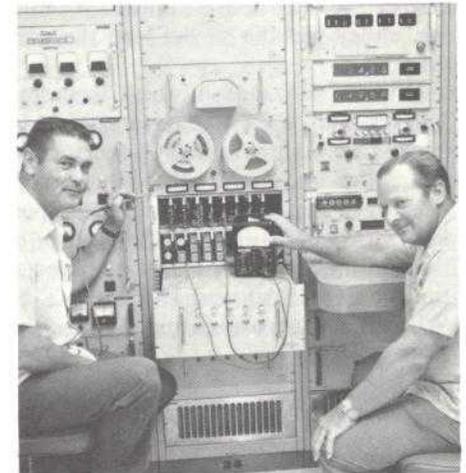
At Paumalu, nine technicians and a supervisor are assigned full-time to TT&C duties. Under the supervision of the Spacecraft Technical Control Center, this skilled team whose total combined communications experience exceeds 140 years provides a complete and accurate record of all Pacific satellite activities on a moment's notice.



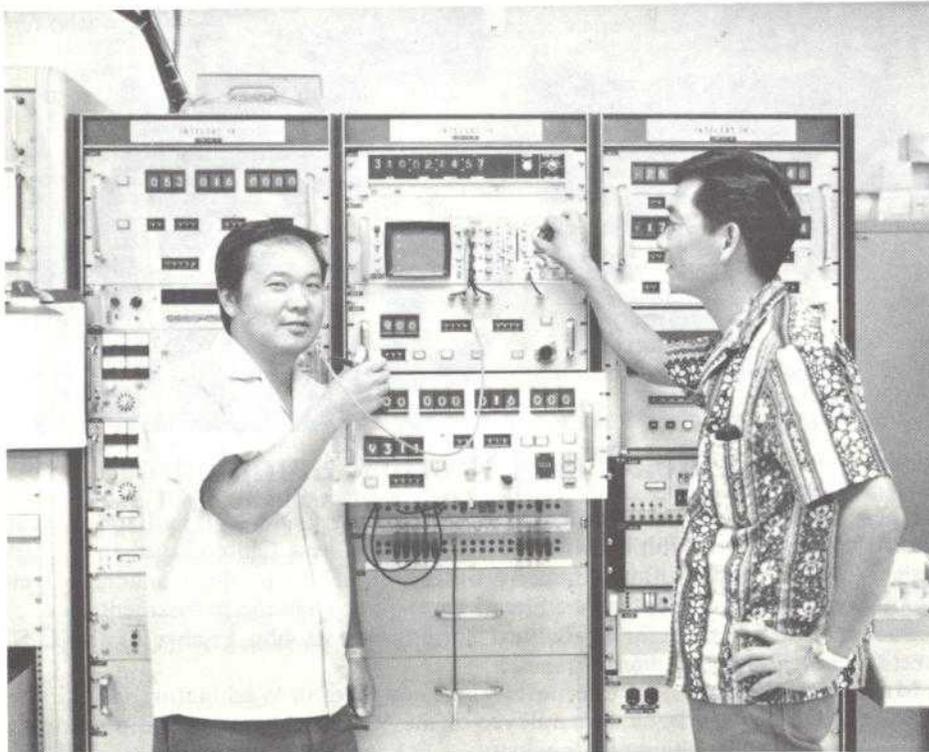
Kent Hunter (seated) and Ron Miyasato check command console.



Jack Vollrath (left) and Paul Koike test tracking capability.



John Stanko (left) and Dick Senones align antenna servo system.



Ed Miyatake (left) and Ken Yamashita, TT&C supervisor, adjust the console.



Tim Kolb checks out a subsystem.

Jury Duty

there was nothing else to do, he handed his son-in-law a coffee cup and they started bailing out. Anyway, Robbie, we are glad to have you home.

Larry Baley, senior technician, is back to work on a crutch. Larry took a tumble off a mini-bike on Thanksgiving Day. After reading Jim Shaff's "Alaskan Slang" in the November *COMSAT News*, someone suggested that maybe Larry should "stay off mini-bikes and snowpoppers, stay home and put on his mukluks, and make sourdough".

Potpourri

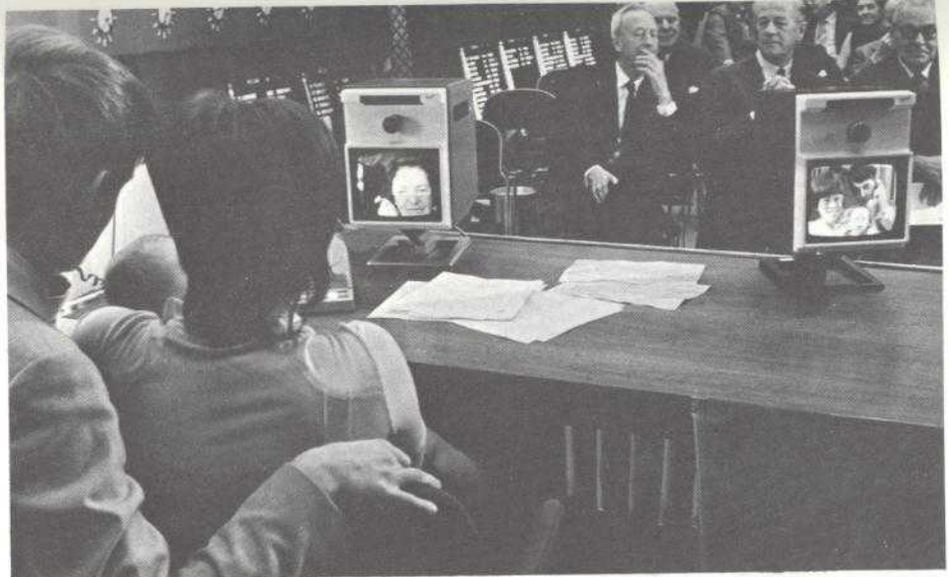
Jamesburg had rather a quiet month in November. We had our annual flu shots getting ready for "Old Man Winter". A refresher course in the use of the resuscitator was held and a film borrowed from AT&T entitled, "Signal 30" (all about safe driving), was shown.

We did get our station beautification program going by having the outside of the building and the antenna painted; now the painters are working on the inside of the building.

Morris Atwell and Charles Franklin, from the M&S Service Center, were here in November. More than 100 items of test equipment were checked. While here, Morris conducted a class on calibration of pyrotronic fire alarm detectors for all facilities and electronics maintenance personnel. Morris was stationed at Jamesburg when he first came to work for COMSAT. So anytime he comes out, it is like old home-week catching up on what he and the family have been doing since his last visit. Of course, we have adopted Chuck Franklin, as this was his third visit to Jamesburg.

Test Completed

Testing with the Antarctic Station was concluded on November 3. Stanford personnel were not able to complete all the tests before the equipment had to be packed and shipped to the Antarctic. However, the tests that were completed using the Antarctic Station receiving equipment and small antenna were very successful. Digital commands were sent from Stanford University over landlines to Jamesburg, through the Stanford-installed equipment and our station to the INTELSAT III, F-4 and back to the small Antarctic station parked alongside our antenna.



Swedish grandparents see their grandchild for the first time on the Videophone satellite link. One grandmother in Sweden (left screen) smiles and talks face-to-face with the young parents holding the baby.

Via INTELSAT IV

U.S.-Sweden Satellite Link Used For Transatlantic Videophone First

The first transatlantic picture telephone call was made on December 3 via satellite between the United States and Sweden.

The demonstration, a communications first, was part of ceremonies formally inaugurating the new Nordic earth station for satellite communication at Tanum, Sweden. The station is jointly owned by Denmark, Finland, Norway and Sweden.

At COMSAT, Videophone equipment, manufactured by the L.M. Ericsson Telephone Company of Sweden, was installed in the Operations Center at Headquarters.

Similar equipment was installed at the Tanum station for on-site ceremonies there. Tanum is located in southwest Sweden about 100 miles north of Göteborg. It is an area famed for archeological findings of stone carvings depicting sailing ships and figures. The carvings are a form of pre-alphabet communications called Hällristningar, said to be more than

2,500 years old.

In contrast, the transatlantic Videophone communications sped at the speed of light via the INTELSAT IV satellite stationed above the Atlantic.

Chairman Dean Burch of the Federal Communications Commission, other representatives from the Government, diplomatic corps, press and guests participated in the dedication ceremonies from the Washington end. COMSAT President Joseph V. Charyk and Gunnar Pedersen, Director General of the Danish Ministry of Posts and Telecommunications, exchanged greetings via Videophone.

The transmissions were sent and received in the U.S. through the earth station at Etam, W. Va.

Arrangements for the necessary terrestrial lines and switching between the Etam station and Washington, D. C., were provided jointly by three U.S. international carriers—Western Union International, RCA Globcom and ITT Worldcom.

Systems Study

COMSAT on behalf of INTELSAT has awarded a contract to Marconi Communication Systems Limited of Chelmsford, England, to conduct a computer program modulation systems study based on a simulation approach for possible future satellite communications applications. The \$40,284 contract is to be completed within nine months.

5-Year Awards

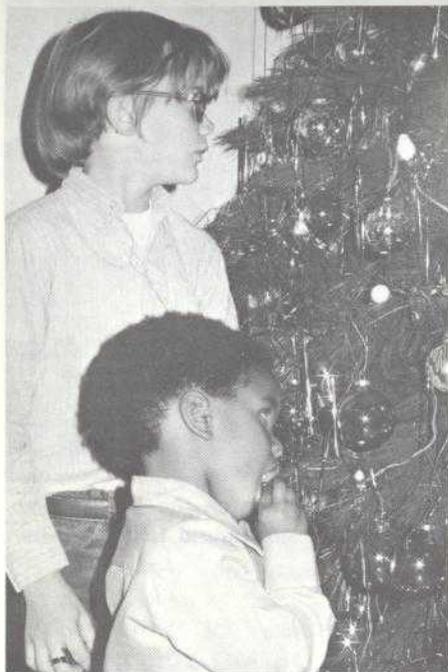
The following personnel received five-year service awards during December:

Finance and Administration: Robert J. Brighthaupt.

General Counsel: James A. Amdur.

Information: James T. McKenna.
Technical: James P. Wilde and Brian J. Williams.

Children's Christmas Party Opens Holiday Season



Christmas Season Arrives at Labs

By Betty Mowen

Christmas is in the air. The atmosphere at the Labs has been one of weekend ski parties, last-minute shopping, holiday affairs, and a lot of headaches. (The Medical Facility is really big on aspirin these days.) There are scenes of breath-taking beauty, rolling hills and wooded areas covered with snow and glistening in the sunlight.

Shirley Taylor opened November 19 in "Splendor in the Grass" at Silver Spring Stage, Colesville Road, Silver Spring, Maryland. Shirley played the part of Mrs. Loomis. Her son, Steven Miller, played the part of Toots, while son Kenneth Miller operated the lights. Lighting was designed by Pep Wurtzel, Office Services. Many COMSAT Lab employees have seen the play and highly recommend it.

December 20, 1971, was the date of the marriage of Susan McLynn, Systems Branch, to John Stein, former Plaza co-op student. After a short honeymoon, the couple will make their home in Gaithersburg, Maryland.

John Sowers, Drafting and Design, with the help of his wife, Donna, gave birth to twin girls, weight 3 pounds, 1 ounce and 3 pounds, 12 ounces (no names yet) on December 5. Mother and daughters are fine. John and the doctor are surprised!

Chuck Dahl, Spacecraft, John Ehrmann, Systems, and Bob Renner, Communications Processing Lab, are scheduled to provide support for the IV, F-3 launch in the Spacecraft Technical Control Center at the Plaza.

Dell Brantley, Systems Lab, is recuperating from pneumonia in Suburban Hospital, Bethesda, Maryland.

(Mrs. Mowen is the COMSAT Labs nurse.)

Christmas, New Year Holidays Scheduled

Since Christmas falls on Saturday this year, Friday, December 24, will be officially observed as the Corporate-paid holiday for all regular, full-time employees.

Since New Year's Day falls on a Saturday as well, the official Corporate-paid holiday for it will also be celebrated on the preceding Friday, December 31.



Members of the Satellite Investment Club at COMSAT are (left to right) George Skinner, Bill Simms, Hasin Hashmi, Pete Ferrandino, Roland Banks, Ed Wabnitz, Jim Kilcoyne, Gordon Littig, Jim Tallon, Paul Rankin, Ben Smith, Paul Cooke, Carl Reber, Stan Shubilla, Sam Scialabba and Joe Wellington.

Membership Grows

COMSAT Staffers Form Stock Club

By Benjamin P. Smith

The Satellite Investment Club was organized by an enterprising group from Finance and Administration in the early part of 1970 as an attempt to master the stock market. From an initial membership of 11, the rolls have now grown to 17 investors. The by-laws, which govern the club operations, permit a total of 20 members but more can be accommodated by amending the by-laws.

The club meets on the second Tuesday of each month to discuss its portfolio, including recommendations to purchase new securities or sell those already held. A five-member executive committee, consisting of two permanent and three rotating members, is charged with the task of evaluating the securities and reporting its decisions and recommendations to the membership at the monthly meetings. A simple majority vote by a quorum of the club membership is required to make any changes in the portfolio. A minimum monthly investment of \$10.00 is required from each member.

The Satellite Investment Club is one of some 60,000 across the country. The typical investment club is 4½ years old, has net assets of over \$27,000 and a membership of from 15 to 25 members.

The current market value of the Satellite Investment Club's portfolio is \$3,400. The club is affiliated with the National Association of Investment Clubs of America. This non-profit organization, with a membership of some 13,000 investment clubs, provides a number of services to its members including helpful hints on stock analysis and assistance in the formation of new clubs. COMSAT's own club drew heavily from these services when it was organized.

The current officers of the Satellite Investment Club are: George Skinner, president; Ben Smith, vice president; Stan Shubilla, secretary; and Paul Rankin, treasurer. New officers will be elected at the annual meeting in February. Guests and potential new members are welcome at all meetings.

Mr. Smith is manager, revenue analysis, in the Comptroller's Office.

Holiday Greetings

We want to wish you a Merry Christmas and express to you at the same time our deep appreciation of all your efforts this year, and before, in making possible the accomplishments of our company.

We have all tried hard to contribute to the growth of the exciting field of satellite communications, which is our mission. We want you to know that we have appreciated your efforts and your dedication to the company and its objectives. Ahead lie many new opportunities and new areas of activity for the corporation. With your help, we are confident that 1972 and the years ahead will be exciting and rewarding years for COMSAT and its people.

With these wishes go a small present—only a token of our appreciation. (Note: A 20-pound turkey was distributed to each regular employee.)

We wish for all of you and yours a wonderful Christmas and a Happy New Year.



Joseph V. Charyk
President

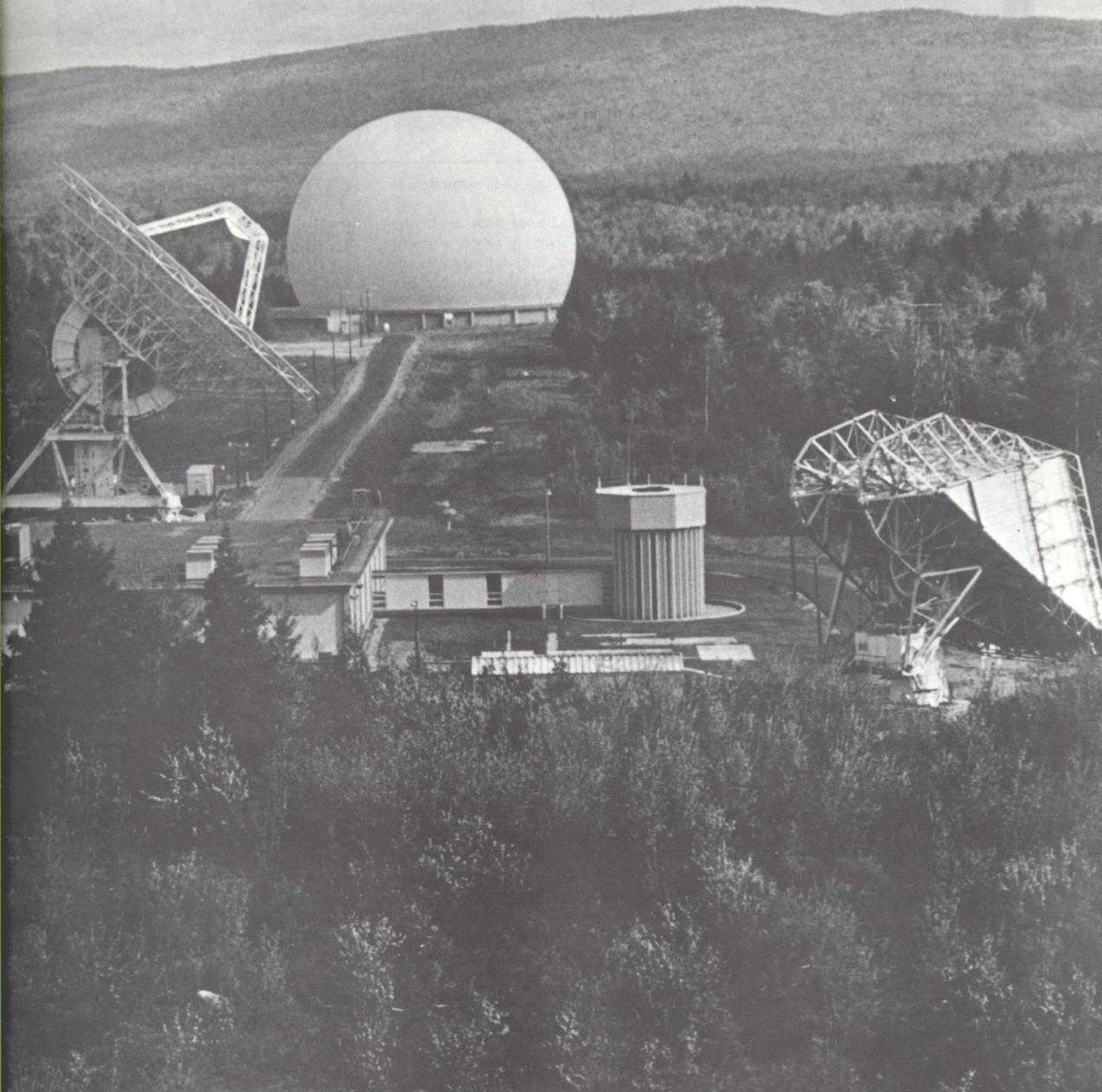


Joseph H. McConnell
Chairman

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Earth Station Performance Seminar Draws Well

The recent INTELSAT Earth Station Performance Seminar was attended by 53 delegates representing 32 administrations. In the picture at the left, G. Lehmann of Germany presents a paper as R.C. Barthle, COMSAT Operations, looks on. The picture at the right shows the delegates during a working session.

Tighter Security At Headquarters

In light of several recent criminal attacks on persons in downtown Washington, D. C., COMSAT has tightened building security at Headquarters.

Among the measures is the employment of a plainclothes security force for continuous surveillance of the building during working hours. In addition to increased security for employees, it is expected that the program will also develop recommendations regarding lax security practices which increase the opportunity of theft or which unnecessarily expose personnel to opportunities for assault.

Additionally, stairwell doors have been locked on the stairwell side and may now be used for emergency exit only. The stairwells may be entered from any floor; however, exit is possible only at the 3rd basement level where (except under building evacuation conditions) persons will be challenged by the L'Enfant Plaza security force.

Persons exiting down the stairwells will encounter an alarm gate between the 3rd and 2nd floors. The alarm gate

alerts security forces that someone is in the stairwells.

Through an arrangement with the L'Enfant Plaza security force, a guard escort service to the automobiles of COMSAT employees is available between the hours of 6 p.m. and 4:30 a.m., seven days a week. Employees who work overtime are encouraged to use the service, which may be arranged by calling the L'Enfant Plaza security office, 554-1067. A security officer will meet the employee in the 10th Street lobby of the L'Enfant Plaza Theater and escort the employee to his or her automobile.

J. Robert Loftis, Jr., Director, COMSAT General Services, asked all employees to help by observing strangers and reporting suspicious persons and incidents to the COMSAT security office, Ext. 6633, and by not inviting theft of corporation or personal property through carelessness.

TRW Wins Contract

COMSAT, on behalf of INTELSAT, proposes to award a contract to TRW Systems Group, Redondo Beach, Calif., for the design, development, testing and delivery of a spacecraft attitude control system. The proposed contract in the amount of \$315,000 is to be completed within one year.

The system's principal components will include a double gimbaled momentum wheel and a programmable digital processor. The momentum wheel will use conventional ball bearings and will represent the best present engineering solutions to problems of weight, reliability, power consumption and lubrication.

Whitehead Urges Open Competition For U.S. Systems

Dr. Clay T. Whitehead, Director of the President's Office of Telecommunications Policy, said in a recent statement that there is no reason for the FCC to hold back companies who wish to build and operate communications satellites in the United States.

He urged a policy of wide open competition that would allow technically and financially qualified companies to operate domestic satellite systems.

Noting that several applications for such systems has been pending for sometime at the FCC, Whitehead said examination by his office produced "no technical economic or legal considerations which preclude the approval of any proposed system".

On the Cover

This recent aerial view of the Andover Earth Station shows the new fourth generation antenna which has been completed and is scheduled to begin service in December with the Atlantic INTELSAT IV satellite. Also shown in the photograph is the radome which surrounds the famous horn antenna, presently on a stand-by basis, and the TT&C antenna. For photos of the Andover staff, see Pages 10 and 11.

November 1971—Year 6, Number 9

COMSAT News is published for employees of the Communications Satellite Corporation by the Information Office, COMSAT Building, 950 L'Enfant Plaza, S.W., Washington, D.C. 20024

Matthew Gordon, Assistant Vice President for Public Information
James H. Kilcoyne, Jr., Editor

By FCC

Rate Hearings to Open December 6

Hearings before the Federal Communications Commission in its investigation into the level of COMSAT rates and rate of return are scheduled to begin on December 6.

Approximately 800 pages of written testimony was submitted by COMSAT on October 26. Included in this material was the testimony of 10 COMSAT officials, including Dr. Joseph V. Charyk, President.

In his statement, Dr. Charyk reviewed the history and early operations of COMSAT and the global system and reiterated that given the risks inherent in the venture a 12 percent rate of return is "at the low end" of any appropriate range for the Corporation's formative years.

The risks cited by Dr. Charyk included the well-known technical risks of launch and satellite failures, as well as uncertainties in areas of:

Regulatory policy, as it affects earth station ownership, authorization of competing facilities and traffic-sharing formulas.

INTELSAT definitive arrangements, under which it is possible that COMSAT may some day be outvoted on substantive technical and operations issues.

Technological advancement of competing facilities, in which breakthroughs conceivably might some day permit competing modes to capture a significant new portion of the international communications market.

"It is our conclusion," Dr. Charyk stated, "that the risks inherent in COMSAT's business are substantially greater than those encountered in general by other utilities, and therefore, COMSAT is entitled to a higher rate of return on equity than might otherwise be allowed other utilities with lesser risks."

In fact, Dr. Charyk noted, under present rates and medium traffic projections, COMSAT will not realize a 12 percent return on an annual basis until at least 1974. Dr. Charyk emphasized, however, that COMSAT's rates are reasonable for the present.

In view of the uniqueness of the satellite venture and the statutory requirements imposed on COMSAT, the Corporation asked the FCC to in-

See Hearings, Page 7



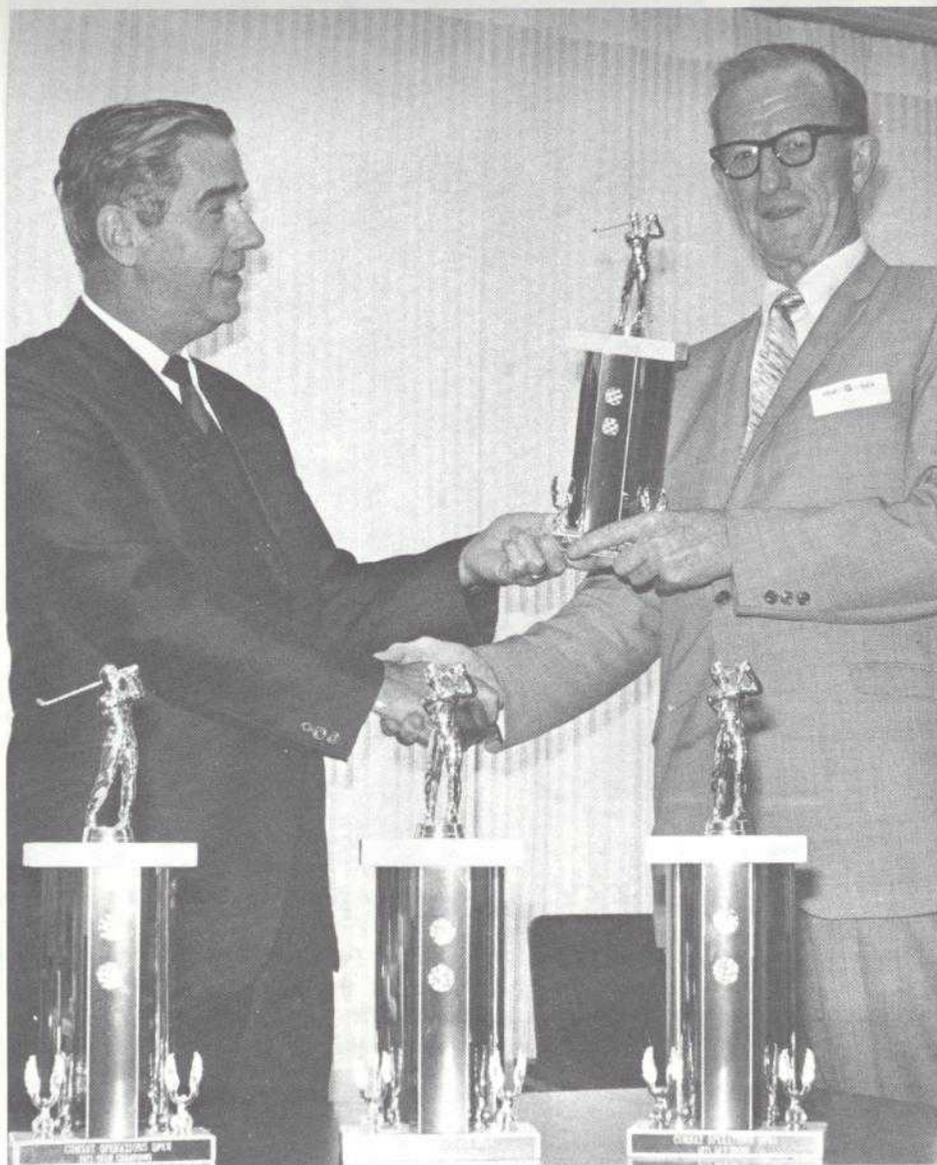
New FCC Member Feted

Matthew Gordon, Assistant Vice President for Public Information, congratulates Mrs. Charlotte T. Reid, newest member of the Federal Communications Commission, at a recent reception in her honor. Mrs. Reid, sworn in on October 8, is only the second woman to serve as a Commissioner.



Earth Station Managers Meet in Washington

George P. Sampson, Vice President-Operations, opens the COMSAT earth station managers annual meeting held September 4-8 in Washington D.C. Shown with an assortment of Washington State's best apples, ready to be eaten, are (left to right) John P. Scroggs, Jamesburg; William T. Patterson, Bartlett; Juan R. Castanera, Cayey; William B. Carroll, Etam; General Sampson; Wallace M. Lauterbach, Brewster; Glenn M. Vinquist, Paumalu; Dr. Robert C. Barthle, Director, U. S. Systems Management, and Donald F. Fifield, Andover.



General George P. Sampson presents the Operations Golf Tournament team trophy to Glenn M. Vinquist who represented the winning Paumalu team.

Corpuz Shoots 75 for Low Gross

Paumalu Wins 2nd Operations Golf

For the second year in a row, Paumalu's "Fearsome Foursome" walked off with the first place team trophy in the annual Operations Open Golf Tournament. Castor Corpuz, Les Goy, Sam Holt and Paul Motoyama turned in a net team score of 292, one stroke better than the Headquarters team number four composed of Marv Bowser, Dave Burks, Bill Hanson and John Welsh.

Other teams participating included Andover (302), Headquarters one (316), Headquarters two (300), Headquarters three (308), Headquarters five—a three man team—(229), Etam, (297), Jamesburg, (299) and Paumalu one (314).

The tournament, open to all Operations personnel, was played during August and offered prizes for low

gross, low net and best team score.

Winners Again

Repeating their individual winning performances of last year, Castor Corpuz, Paumula, won the trophy for low gross score with a 75, while Headquarters' Dave Burks took low net honors with a 71.

Presents Trophy

General George P. Sampson, Vice President-Operations, presented the winner's trophy to Glenn M. Vinquist, station manager, who represented the Paumalu team at the recent station managers meeting in Washington, D.C.

Paumalu will keep the trophy until next summer, when both the title and trophy will go to a new winner.

COMSAT Issues Technical Review For Professionals

The first issue of the COMSAT Technical Review, a new external periodical for engineers and scientists working in communications satellite technology, has been published by COMSAT and will be distributed to the mailing list in several days.

The publication, known informally as the CTR, is the first periodical anywhere devoted solely to communications satellite technology. It is planned for publication twice a year, initially, and will be distributed widely to professionals in the United States and other countries. The second issue is now being prepared for publication next spring.

Major goals of the CTR include the following:

1. To address a world-wide community of engineers, scientists and others whose activities are related to communications satellite technology.
2. To provide a medium for the presentation of various aspects, trends and applications of satellite communications.
3. To promote the understanding and use of communications satellites, and to contribute to a broader application of their benefits to meet expanding communications requirements around the world.

In a preface to the first issue, Dr. Joseph V. Charyk, COMSAT President, stated:

"COMSAT is privileged to have played a pioneering role in establishing the global commercial communications satellite system, and in the advancement of a satellite technology which is steadily growing in complexity and magnitude. The technical achievements so far have been impressive indeed. But achievement of the full potential of satellite communications depends in large measure on research and technical work yet to be done.

"It is appropriate, therefore, that this Corporation, with extensive research and technical capabilities of its own, undertake publication of the first technical periodical devoted exclusively to satellite communications."

Dr. Charyk concluded by saying, "It is our high hope that the COMSAT

See Review, Page 5

Review

Technical Review will contribute to greater technical understanding and achievement in satellite communications."

General guidance for the CTR will be furnished by an Advisory Board consisting of Dr. Charyk; Sidney Metzger, Assistant Vice President and Chief Engineer; Wilbur L. Pritchard, Assistant Vice President and Director, COMSAT Labs, and Dr. William W. Hagerty, President of Drexel University and a Director of COMSAT.

Papers for publication will be selected by an Editorial Board, composed of COMSAT professionals.

The Chairman of the Editorial Board is Dr. Pier L. Bargellini, Senior Staff Scientist in the Office of the Director, COMSAT Labs, and formerly Professor of Electrical Engineering at the University of Pennsylvania.

Other members of the Editorial Board are:

Dr. Robert C. Barthle, Operations; Dr. N. K. M. Chitre, Dr. Leonard Golding, Dr. Gary D. Gordon, Dr. Geoffrey Hyde, Joachim Kaiser, all of COMSAT Labs; Edward J. Martin, Aeronautical and Domestic Systems Project Office; Emeric Podraczky and Dr. Edmund S. Rittner, both of COMSAT Labs, and Reinhard Stamminger, Systems Engineering.

Overall management responsibility for the CTR was assigned by Dr. Charyk to Lucius D. Battle, Vice President-Corporate Relations, and to Matthew Gordon, Assistant Vice President for Public Information.

The editors are Larry Weekley and Gerald H. Bidlack, Information; and Leonard F. Smith, Labs Publications. Publication responsibility rests with the Information Office.

A style manual for CTR authors has been prepared by Judy Coffey, COMSAT Labs librarian, with the assistance of several other persons.

An introductory mailing list, compiled by Mrs. Shirley Taylor, Labs, from inputs from various persons in the Corporation, has been computerized under the direction of John C. Hill, II, Corporate Relations.

Authors of papers in the first issue include Ernesto R. Martin, A. E. Atia and A. E. Williams, J. C. Fuenzalida and N. K. M. Chitre, E. E. Steinbrecher and L. F. Gray, R. A. Arndt and L. M. Westerlund, Marvin Wachs, Eugene R. Cacciamani, Jr., W. W. Wu, and H. D. Craft, Jr.



Sand barriers at Umm Al-Aish.

Barriers Erected

Sandstorms Cause Unique Problems At Umm Al-Aish Earth Station Site

One of the many interesting papers submitted during the recent Earth Station Performance Seminar was the Kuwait contribution which dealt with the operation and maintenance of the Umm Al-Aish earth station.

Located in the desert about 71 kilometers from Kuwait City, the capital of this small but oil-rich Arab state, Umm Al-Aish has been in service since October 1969.

Because of extremes in temperatures and heavy sandstorm activity, some unusual steps have been taken by the Ministry of Posts, Telegraphs and Telephones to insure a high level of station reliability.

During the summer season, heavy sandstorms occur on the average of five days per week. Average wind velocity often reaches 40 miles an hour with sand swirling as high as 75 feet.

To minimize the effect of these storms, sand barriers have been erected on the northwest side of the station as the prevailing winds are from that direction.

Crude oil has also been sprayed around the area as another means of cutting down the amount and force of wind-driven sand.

Even with these efforts to lessen the damage of the storms, the report

states that personnel and equipment have been affected. But it proudly concludes that "communications have not been affected directly by the sandstorms and neither have the storms damaged the antenna nor accumulated on its surface".

Seminars Stimulate Employee Awareness

The COMSAT Laboratories and the Technical Staff have initiated a series of in-house seminars.

These seminars are designed to help employees increase their awareness of the various activities within the Corporation and to provide cross-fertilization of ideas. They will present the technical aspects of research and development and will be geared for the layman. The seminars are intended to be informative and instructive.

To be presented on a monthly basis, they are open to all employees of the Corporation. Employee interest and participation will determine the future of the program. Any questions concerning the seminars or suggestions for future topics may be directed to J.P. Giafaglione, U.S. Systems Management, Room 7157, Extension 6238.

Actions of the Interim Committee

The Interim Communications Satellite Committee held its 55th meeting in Buenos Aires, Argentina, from September 29 to October 6. All 18 members of the Committee were present:

Among its actions, the Committee:

- Agreed to establish a satellite utilization charge during 1972 not to exceed \$13,000 per unit per year. The Committee also asked the Advisory Subcommittee on Finance to convene in November to study additional information that might result in a charge lower than \$13,000 and to report the results of this study to the Committee at its next meeting in December.

- Adopted the Manager's recommendation that the charge for a 1.544 Mb/s PCM/PSK half circuit (to be used for digital or voice communication) be equivalent to the charge for

24 units of satellite utilization on a full-time basis. Charges might, however, be modified after experience with this form of transmission.

- Adopted the concept that long-term allotments of space segment capacity for television would be on the basis of fully allocated costs. As a guideline to Signatories, the charge for use of a full INTELSAT IV transponder allotted on a full-time basis for television use, including audio services, was set at 360 units; and the charge for use of one-half of an INTELSAT IV transponder allotted on a full-time basis for television use was set at 180 units. This general subject, however, will be under further consideration at the next ICSC meeting.

- Adopted the recommendation of the Manager that the rate adjustment

(penalty) factors of 2.5 and 10 for 31.7 and 25.7 G/T nonstandard stations, respectively, be applied on a system-wide basis.

- Approved the Manager's recommendation that a rate adjustment factor of four be applied for operation of Iran's nonstandard (transportable) earth station for access to INTELSAT III or IV satellites in connection with its celebration of the 2500th anniversary of the Persian Empire.

- After having agreed at its 54th meeting that the second INTELSAT IV satellite would be emplaced over the Atlantic at 19.5 degrees west Longitude, agreed for planning purposes that the third INTELSAT IV would be emplaced over the Pacific Ocean at 174 degrees east Longitude, with the Pacific INTELSAT III, F-4 being moved to 179 degrees east Longitude.

- Authorized the Manager to request the Federal Communications Commission to file frequency assignment notices with the International Frequency Registration Board for an Indian Ocean INTELSAT IV satellite at a nominal location of 61.4 degrees east Longitude, and a second Pacific INTELSAT IV satellite at 179 degrees east Longitude.

- Approved INTELSAT joint sponsorship with Societe Francaise Electriciens et Radioelectriciens (SFER) of a Second Digital Satellite Communications Conference in Paris during late 1972 with a contribution not to exceed \$5,000.

- Approved COMSAT's application for operation of a non-standard (ship terminal) station to access without charge an Atlantic INTELSAT IV satellite for experiments and demonstrations in COMSAT's digital communications R&D program.

- Noted the conclusion of the ICSC/T that the interference produced by the Canadian System into the INTELSAT System will always be considerably less than the unacceptable level of interference, thus eliminating the need for special precautions aimed at reducing the interference effects further.

- Granted formal approval to Japan for the Ibaraki 3 station to operate with INTELSAT III and IV satellites, and to the Hong Kong 2 (U.K.) station to operate with INTELSAT III satellites.

- Approved a one-year extension in the term of G.C. Hall, a nominee of the United Kingdom, on the Operations Staff of the Manager.

- Scheduled the next meeting of the Committee for Washington, D.C., beginning December 8, and set opening dates of the first two meetings in 1972 for February 23 and April 26.



The recent Buenos Aires meeting of the ICSC was the sixth to be held away from INTELSAT headquarters in Washington, D.C. The ICSC has met in previous years in Paris, Tokyo, Naples, Rio de Janeiro and Sidney.



COMSAT, as Manager for INTELSAT was represented at the meeting by (left to right) Lewis C. Meyer, H. William Wood, Reginald C. Westlake, William D. English and Edward N. Wright.



His Highness receives a briefing from Neil Benedict as Dan Karasik looks on.

Tours Headquarters

COMSAT Greets Sikkim Royalty

COMSAT played host to its first monarch on November 1. The ruler of the Himalayan kingdom of Sikkim toured Headquarters during his recent non-official visit to the United States.

Sikkim slightly larger than Delaware sits astride the strategic Natu Pass, the principal route between Tibet and India. Its neighbor on the east is Nepal and on the west is Bhutan. His Highness, the Chogyal of Sikkim, was in Washington with his American-born Queen, the former Hope Cook, visiting friends and relatives. Her Highness, the Gyalmo, is the niece of the late career Ambassador Selden Chapin whose widow lives here.

Dr. Charyk greeted the king in his office and spoke of the rapid advances of international communications made possible by communications satellites. The King then outlined some of his country's communication problems to Dr. Charyk, General George P. Sampson, Vice President-Operations, and George A. Lawler and Daniel D. Karasik of Marketing. He then visited the Operations Center and the Spacecraft Technical Control Center. During his tour of the Operations Center, the King spoke briefly via the satellite order-wire to the Moree, Australia, earth station and was impressed by the quality of the circuit.

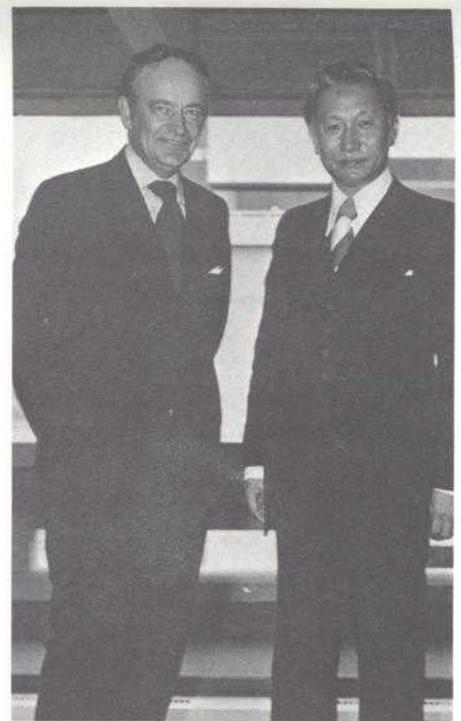
His Highness was escorted on his visit to COMSAT by Mr. Karasik.

Mr. Karasik was befriended by the King in the winter of 1963-1964 when he spent more than seven weeks in Sikkim producing a documentary film, "Sikkim and its Yankee Queen", which was first shown on the NBC television network in 1964. Since then, the telecast has been repeated in the United States, and also viewed in a number of countries abroad. The king said that, as recently as last year, he received mail from Scandinavia after the film had been seen on television there.

His Highness the Chogyal, whose given name is Thondup, and Mr. Karasik have stayed in contact over the years, exchanging letters and Christmas cards and spending time together when the king has been in America. The king last visited the U.S. in 1965. During that trip, as during this one, Mr. Karasik received a surprise phone call which began, "Dan this is Thondup. . ."

Before he left COMSAT, the king visited the 16-foot antenna outside the Headquarters building, and said that it would be useful in his country. Now communications are primarily handled by 30 high frequency radio stations scattered about the mountain kingdom.

Mr. Karasik and his wife, Lois, attended a formal buffet reception, hosted by the royal pair before their return to Sikkim.



Dr. Charyk greets the Chogyal.

From Page 3

Rate Hearings

crease the allowable interest during construction from 7 percent to 12 percent and to approve 2 innovative approaches for determining a rate of return for the Corporation. The two are:

1. Capitalization of deferred Profits. This would recognize that COMSAT offered low rates in its formative stages in order to attract business and not to burden the initial users of the satellite system with the development costs.

2. Inclusion of sustaining capital in the rate base. Dr. Charyk said sustaining capital is needed for two purposes: to provide funds to establish the initial global system, and to provide a contingency reserve. COMSAT included in the rate base in each year through 1969 the amount of additional funds needed for these purposes beyond the funds generated internally by operating revenues and investment income.

Beginning in 1970, he said, internally generated funds were sufficient to meet all current expenditures. However, "the inclusion for sustaining capital in any year through 1973 never falls below \$25 million in order to reflect the need for a minimum contingency reserve. . ."

COMSAT also advised the FCC that rate-making by the traditional method of determining revenue requirements for a "test year" is inappropriate for the Corporation.



Novice singles winner Troutman.

5-Year Awards

The following personnel received five-year service awards during October and November:

Andover: Donald E. Auger and Daniel O. Grenier.

Finance and Administration: Audree J. Coutry, J. Harry Evans, Melvin P. Harley, John C. Lawrence, John J. Lehan, Jr., and George L. Skinner.

General Counsel: Jerome W. Breslow.

International: Hiram A. Bingham.

Jamesburg: James J. Harding.

Laboratories: Robert W. Cool, and Randall W. Kreutal, Jr.

Operations: Edward L. Courville, Daniel D. Karasik and Ella M. Sittler.

Paumalu: Howard J. Bunch.



Bill Lowe and Tony Clarke admire Henry Williams' trophy.

In Annual Tennis Match

Williams Wins Advanced Singles As Clark and Lowe Take Doubles

Henry Williams, Labs, swept to his second advanced singles title in four years as he defeated Bob Brown, International, in straight sets, 6-4 and 6-1 during the recent COMSAT annual singles and double tennis tournament. Williams, winner of the title in 1968, never lost a set on the way to his victory.

The doubles team of Tony Clarke and Bill Lowe, both of the Labs, succeeded in defeating Bob Brown, International, and Alan Kasper, Legal, in three sets (3-6, 6-4, and 6-3) to take the doubles crown.

In the newly-added novice class, Paul Troutman, Operations, won his first title by default when Kim Kaiser, Labs, was sidelined by illness.

A total of 20 players took part in the advanced singles competition, while 18 played in the novice class. In the doubles play, 14 teams saw action, as the CEA-sponsored tournament marked its fourth successful year.

Results of all matches:

Advanced Singles

First Round

Tony Clark, Labs, drew a bye.
 Jim Dunlop, Labs, drew a bye.
 Henry Meyerhoff, Labs, defeated Jeff Rubin, Labs, 6-1, 6-4.
 Jay Levatich, Labs, drew a bye.
 Bill Lowe, Labs, drew a bye.
 Tony Buige, Labs, drew a bye.
 Bob Strauss, Labs, defeated Tom Patterson, Labs, 6-2, 6-3.
 Henry Williams, Labs, drew a bye.
 Ed Jordan, Technical, drew a bye.
 Tom Tuttle, Legal, won by default over Nat Tonelson, Technical.

Marty Fliesler, Legal, drew a bye.
 Al Kasper, Legal, drew a bye.
 Bob Brown, International, drew a bye.
 Dick McBride, Technical, defeated Stan Schachne, Technical, 6-2, 6-1.
 Dan Flynn, Personnel, drew a bye.
 Tony Bingham, International, drew a bye.

Second Round

Clark defeated Dunlop, 6-3, 6-1.
 Levatich defeated Meyerhoff, 6-1, 6-0.
 Lowe defeated Buige, 6-1, 6-0.
 Williams defeated Strauss, 6-2, 6-2.
 Jordan defeated Tuttle, 6-0, 6-2.
 Kasper defeated Fliesler, 6-3, 6-1.
 Brown defeated McBride, 8-6, 3-6, 6-1.
 Flynn defeated Bingham, 5-7, 6-0, 6-0.

Quarterfinals

Clark defeated Levatich, 6-1, 6-0.
 Williams defeated Lowe, 6-2, 6-3.
 Jordan defeated Kasper, 6-1, 3-6, 6-4.
 Brown defeated Flynn, 4-6, 6-4, 6-3.

Semifinals

Williams defeated Clark, 6-3, 7-6.
 Brown defeated Jordan, 6-4, 7-5.

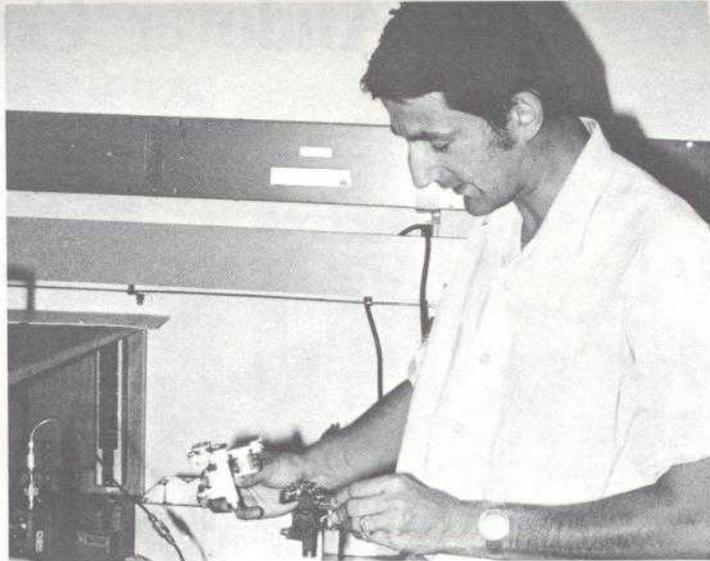
Finals

Williams defeated Brown, 6-4, 6-1.

Novice Singles

First Round

J. Ayoub, Labs, drew a bye.
 Hugh Hutchens, Labs, drew a bye.
 Bud Kennedy, Labs, drew a bye.
 Tom Dobyns, Labs, drew a bye.
 George Huson, Labs, drew a bye.
 Jeff Rubin, Labs, defeated Al Ramos, Labs, 6-2, 6-3.
 Kim Kaiser, Labs, drew a bye.
 Kishore Chitre, Labs, drew a bye.
 John DeCaro, Technical, drew a bye.
 Hale Montgomery, Information, drew a bye.
 Paul Troutman, Operations, defeated Ray Sicotte, Labs, 6-2, 6-4.



ATIS-F Transponder Accepted

The transponder section of the RF Transmission Laboratory recently completed a ATIS-F transponder for NASA. In the picture at the left, Jay Levatich, Labs project manager, and Larry King, NASA technical officer, examine the unit. In the picture at the right Chris Mahle, Labs task manager, assembles a section of the unit.

Washington CEA News and Notes

1972 Board of Directors Elections to Be Held Soon

By Bert Runfola

Preparations for the election of the 1972 Board of Directors are underway. The division candidates to be chosen this year include two from the Labs, two at-large and one from Operations. Be sure and vote!

Table Tennis

Table tennis is going strong everyday from 12 noon to 2 p.m. on the 4th floor. Everyone is invited to come and play.

Photography Club

Continuing exhibits can be seen outside the Credit Union on the 4th floor at the Plaza. Stop by and take a look.

The club meets bi-weekly. If you are interested in teaming up with the camera bugs, contact Bob Kotell, president, on Ext. 6810.

Chess Club

Anyone interested in joining the club is invited to see Jim Shreve, president. Nomination of new officers for 1972 were discussed at a meeting on November 15. Jim Shreve hopes to have a year-end tournament.

Bowling Club

John Maddox is organizing a bowling team. If you are interested, phone him on Ext. 6851.

Social Calendar

It's that time of year again and social chairman Kitty Harbin and Bob Cool have plans well under way for the annual Christmas Dinner Dance which will be held at the Shoreham Hotel in the Ambassador Ballroom, Saturday, December 18. A reception prior to the dance will take place in the Regency Room Lounge. This year the dance will take place in the Regency Room Lounge. This year the CEA will provide two bands to enhance the enjoyment. Watch for flyers soon to be released.

Also on the agenda for December is the Children's Christmas Party which will take place this year at the Feather and Three Dance Studio, 2433 North Harrison Street, Arlington, Va., on Saturday, December 11. The fun will start at 1 p.m. All members' children under 10 years of age are welcome. Christmas goodies and fun will be plentiful, and of course, Santa Claus will be present.

Satellite Jewelry

Need a little something to fill the stockings to hang over the fireplace? Beat the holiday rush and get your satellite jewelry now from Pat Lamphear at the Plaza or Delores Hess at the Labs.

Girls Basketball

The girl's basketball team, called the "Long Shots," is currently practicing every Thursday at 7:00 p.m. at Jefferson Junior High School. Anyone interested in joining the team will be welcomed at practices. For further information, phone Coach Tyrone Ricks, Ext. 6676 or 6677.

Returning for another season are the captain, Kitty Harbin; co-captain, Ruth Peed; Bert Runfola, Harriett Biddle, Diana Pontti and Lucina Pete. The team's new members are Roz DeClue, Maryann Swann, Lois Sundermann and Pearl Coleman.

Radio Club

At a recent meeting, the radio club elected new officers. Cal Cotner was elected president; Lyn Heiges, vice president; and Jeff Steinhorn was re-elected secretary/treasurer. The station at the Labs is now operating on two-meter FM via the Baltimore repeater on 146.34-146.76 MHz. A new 1000-watt amplifier has been acquired for the station at the Labs to replace the one loaned by Laurie Gray.

Plans are in progress to operate in the ARRL Sweepstakes contest during November.

Andover Comes of Age



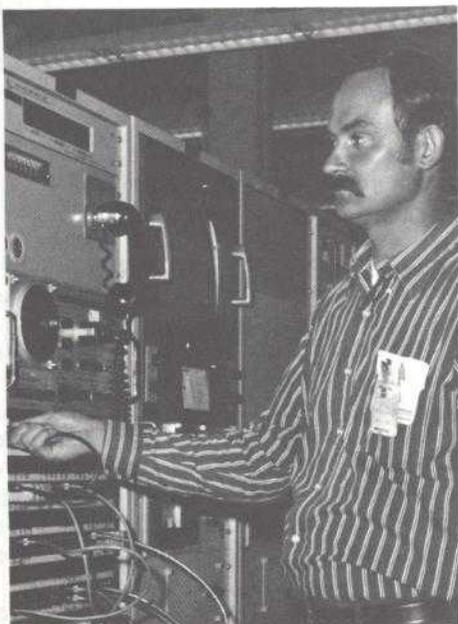
Judy Hodgkins is the secretary who sees that all paper work is completed.

The Andover earth station is located about 70 miles northwest of Portland, Maine, in the foothills of Oxford County. The station has more than 40 employees and is the second largest U.S. earth station working with the global satellite system. As with other earth stations, Andover is operational 24 hours a day, seven days a week, tracking and communicating with INTEL-SAT satellites.

Expanding the capacity of this station is a new 97-foot dish antenna which will operate with the INTEL-SAT IV satellite. This new antenna is capable of transmitting all forms of telecommunications to countries in the Atlantic basin via Atlantic satellites. The new wheel and track antenna, often referred to as the fourth generation in earth terminal development, replaces the pioneering horn which will be placed on "stand-by."



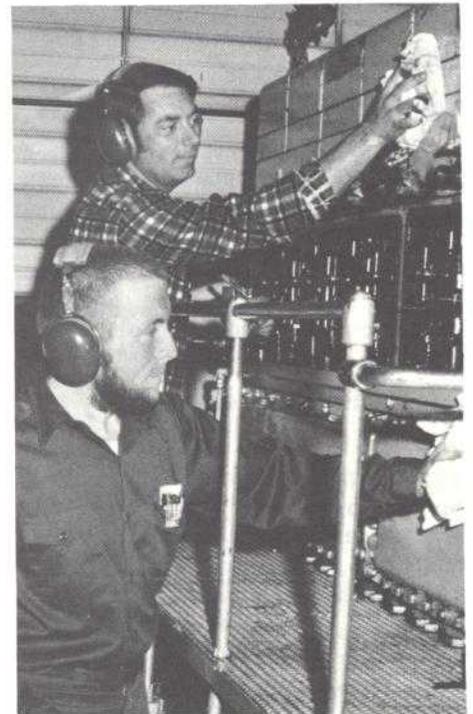
Station manager Don Fifield (left) and Swen Engolm, station administrator, review an incoming system status report.



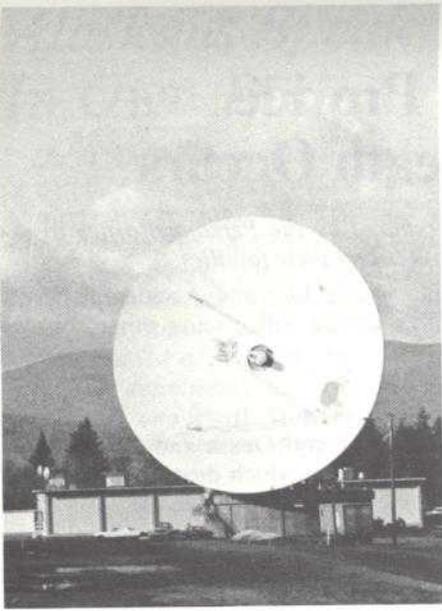
Shaun Arness sets up a TV monitor for a newscast via INTEL-SAT III, F-7.



Merwyn Bartlett and Bill Merrill review a station maintenance manual.



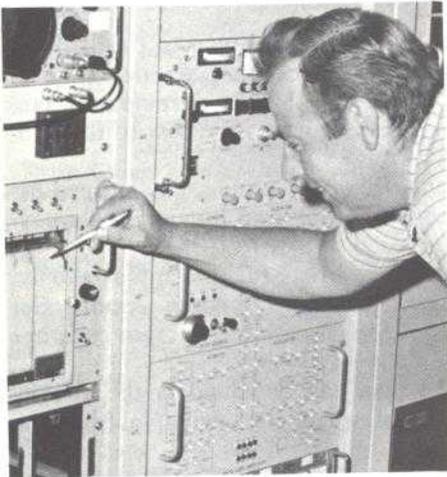
Ron Wells (foreground) and Jim Vienneau clean up after diesel adjustment.



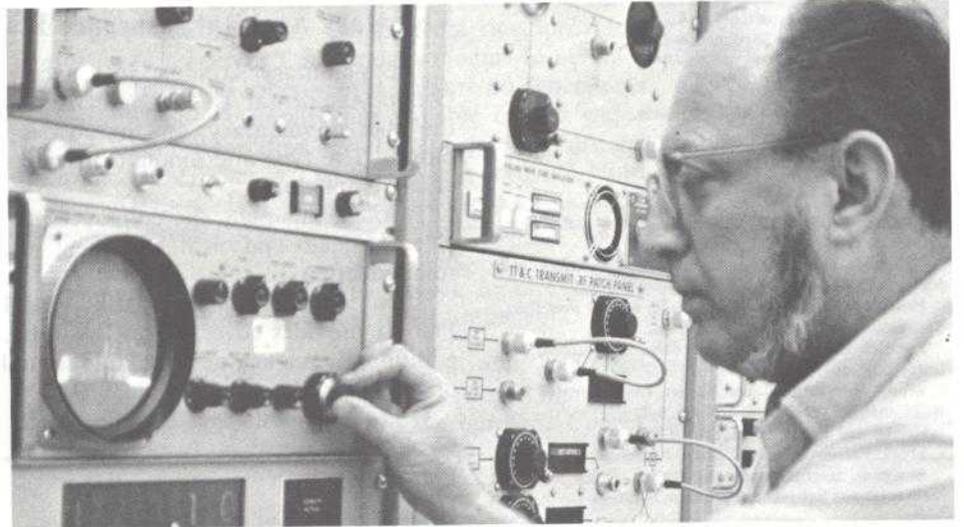
The new antenna will operate with the Atlantic INTELSAT IV.



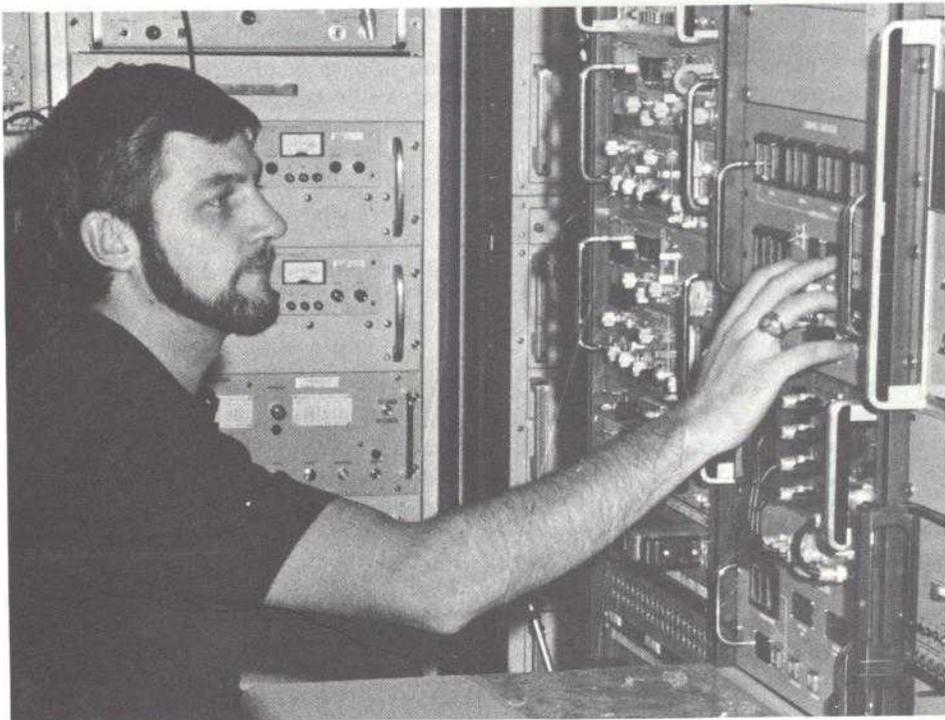
Many who tour the earth station also stop by the Visitors Center.



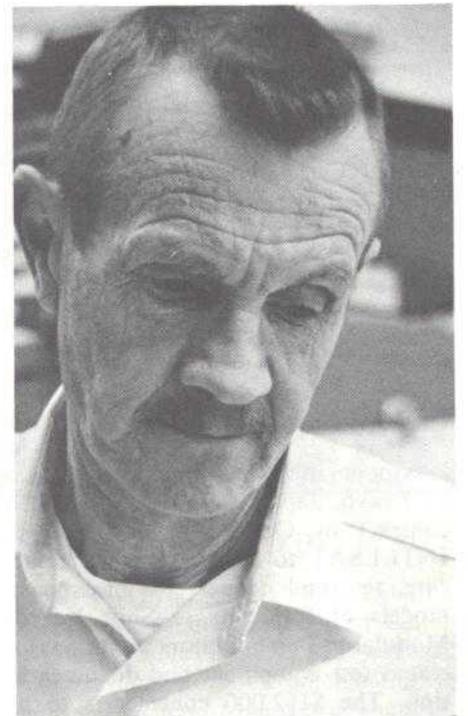
Ken Dixon checks the azimuth and elevation of the horn antenna.



Hal Frazier adjusts a scope for a frequency reading.



Don Auger reviews telemetry data of the INTELSAT IV satellite.



Ray Juhl is the materials specialist.

Tennis Results

Bob Kinzie, International, drew a bye.
 Jim Hall, Technical, drew a bye.
 Renate Pawlik, Finance & Administration, drew a bye.
 Frank Klisch, Technical, drew a bye.
 Stuart Bond, Finance & Administration, drew a bye.

Second Round

Ayoub defeated Hutchens, 1-6, 6-4, 6-1.
 Dobyms defeated Kennedy, 6-0, 6-0.
 Huson defeated Rubin, 7-6, 2-6, 6-3.
 Kaiser defeated Chitre, 6-1, 6-3.
 Montgomery won by default over DeCaro.
 Troutman defeated Kinzie, 6-2, 6-1.
 Pawlik won by default over Hall.

Quarterfinals

Ayoub defeated Dobyms, 5-7, 6-0, 6-1.
 Kaiser defeated Huson, 6-2, 6-3.
 Troutman defeated Montgomery, 6-0, 6-3.
 Bond defeated Pawlik, 7-5, 6-2.

Semifinals

Kaiser defeated Ayoub, 6-3, 6-4.
 Troutman defeated Bond, 6-0, 6-1.

Finals

Troutman won by default over Kaiser.

Doubles

First Round

Clark and Lowe, Labs, defeated Ayoub and Kaiser, Labs, 6-0, 6-0.
 Patterson and Ramos, Labs, defeated Chitre and Meyerhoff, Labs, 6-1, 6-3.
 Huson and Schrantz, Labs, won by default over Baer, Technical, and Troutman, Operations.
 Levatic and Williams, Labs, defeated Hutchens and Rubin, Labs, 6-7, 6-2, 6-0.
 Brown, International, and Kasper, Legal defeated McBride and Ball, Technical, 6-2, 4-6, 6-2.
 Fliesler and Tuttle, Legal, drew a bye.
 Flynn, Personnel, and McBride, Technical, drew a bye.
 Bingham, International, and Jordan, Labs, defeated DeWenter and Schachne, Technical, 6-1, 6-1.

Quarterfinals

Clark and Lowe defeated Patterson and Ramos, 6-1, 6-1.
 Levatic and Williams defeated Huson and Schrantz, 6-2, 6-1.
 Brown and Kasper defeated Fliesler and Tuttle, 6-4, 7-5.
 Bingham and Jordan defeated Flynn and McBride, 9-7, 6-4.

Semifinals

Clark and Lowe defeated Levatic and Williams, 6-4, 6-4.
 Brown and Kasper defeated Bingham and Jordan, 5-7, 6-4, 6-1.

Finals

Clark and Lowe defeated Brown and Kasper, 3-6, 6-4, 6-3.

One Gigabit Modem

Nippon Electric Company, Limited, of Tokyo, Japan, has been awarded a contract by COMSAT on behalf of INTELSAT to design, develop, fabricate, test and deliver two brassboard models of PSK (Phase Shift Keyed) Modulator-Demodulators with associated test equipment and documentation. The \$162,000 contract is to be completed within 15 months.

For Your Benefit

COMSAT Benefits Provide Additional Aid If Death Occurs

This is the fourth in a series of articles prepared by the Personnel office to explain COMSAT's benefits program to employees and their families.

Last month's article reviewed COMSAT's "Group Life and Accidental Death and Dismemberment Insurance." This month's article will discuss other sources of benefits in case of an employee's death.

Benefit Sources

In addition to COMSAT's Group Life and Accidental Death and Dismemberment Insurance plans, there are also other sources from which death benefits may be derived. These include:

- The Voluntary Accident Insurance plan
- The Business Air Travel Insurance plan
- The Thrift and Savings plan
- Social Security
- Workmen's Compensation

Voluntary Accident Insurance Plan

The Voluntary Accident Insurance plan is a supplemental plan to COMSAT's Group Accidental Death and Dismemberment Insurance plan. Participation in the plan is voluntary, and its cost is paid for entirely by the participating employee. The type and amount of coverage purchased governs the cost to the individual employee.

Through this plan, the employee has the opportunity to purchase additional accidental death and dismemberment insurance for himself and his family via payroll deduction.

There are two plans available. Plan I provides coverage for the employee only. Plan II provides coverage for the employee, spouse, and/or children. Amounts of additional coverage are available in multiples of \$5,000 with a minimum coverage of \$10,000 and a maximum of \$100,000.

Other highlights and specific details of the plan can be found in the booklet "Voluntary Accident Insurance Plan", copies of which are available from the Personnel office.

Business Air Travel Insurance

The Business Air Travel Insurance plan provides \$50,000 of accidental death and dismemberment insurance for all employees traveling via air transportation on Corporation business.

It also provides similar insurance protection in case of dismemberment or loss of life in consequence of riding as a passenger, while boarding, alighting from or being struck by:

- any aircraft licensed to carry passengers;
- any military air transport type aircraft;
- any ground conveyance licensed for passengers while traveling to or from the airport.

Participation in this plan is automatic with employment and the cost is paid entirely by COMSAT.

Thrift and Savings Plan

An employee may participate in the Thrift and Savings plan by electing to invest (via payroll deduction) from 1% to 6% of his base, annual salary. COMSAT contributes, on the employee's behalf, an amount equivalent to 50% of the employee's investment, or \$1 for every \$2 invested by the employee.

With an employee's death, the full value of the employee's Thrift and Savings accounts will be paid to the employee's designated beneficiary. If a beneficiary has not been named, the value of the accounts will be paid to the employee's estate.

Social Security (F.I.C.A.)

While the Social Security Act was passed primarily to provide financial assis-

Alaskans Speak In Own Dialect

Up in Alaska the residents frequently sprinkle their speech with a variety of slang expressions which would be unintelligible to non-Alaskans, but which are direct, forceful and economical colloquial expressions for those who know the meanings. Following is a list of some of those words, with the definitions, as prepared by Jim Shaff and Patti McKenna of the Bartlett Earth Station staff.

Sourdough: (1) Yeasty type substance from which bread, biscuits, pancakes, etc. are made.
(2) An oldtimer in Alaska.

Cheechako: Newcomer to Alaska.

Bush: Away from the population centers (i.e. Talkeetna).

Snowpopper: Snowmachine.

Banana Belt: Southeastern part of Alaska.

Interior: Central portion of Alaska.

Outside: Anywhere else except Alaska.

Breakup: When the ice goes out on the rivers.

Roadhouse: Combination hotel and restaurant (usually rustic).

Moose Gooser: Alaska railroad.

Skookum: Strong, able.

Muktuk: Whale meat with white blubber attached—eaten raw.

Mukluks: Footwear made from animal skins.

Parky: Alaskan coat, often made of fur.

Silvers, Dogs, Reds, Kings: Various forms of salmon.

Lower 48: The smaller states to the south.

Musher: One who drives a dog team.

Denali: Indian name for Mt. McKinley.

Evil Alice: Alice Powell, owner and operator of the Talkeetna Motel and a renown culinary artist.

Tundra: Vast, level, treeless plains in the Arctic.

Oomiak: A boat made from seal skins.

Nenana Ice Pool: Alaska's biggest guessing game. A tripod is placed on Nenana River with wire attached to a clock. Everyone tries to guess the exact minute the ice will go out, moving the tripod and breaking the wire. Thousands of dollars are wagered each year—for Alaska residents only.

Cache: A place where goods or supplies are hidden or stored.

Freeze up: When the ice on lakes and rivers will support a man's weight.

Termination dust: First new snow visible on the mountains, signifying the end of the construction season.

Moose Berries: Moose droppings which are used to make jewelry and various other tourist type gifts.

Rack: The set of "horns" sported by a bull moose in the fall of the year.

Potlach: Native feast with dancing and food.

From Page 12

COMSAT Benefits Program

tance upon retirement, death benefits are provided to qualified surviving dependents under certain specified conditions.

Under the terms of the act, both the employee and COMSAT are taxed an equal percentage of the employee's gross pay subject to a maximum specified by law.

Social Security provides a lump sum death benefit (current maximum of \$255) and monthly benefits to the surviving family of a qualified employee.

For example, monthly Social Security benefits will be payable to widows with dependent children regardless of the widow's age; widows without children over a prescribed age; and surviving dependent children. In some cases benefits may also be payable for dependent aged parents.

Detailed information about Social Security benefits may be obtained from your local Social Security office or from the Personnel office.

Workmen's Compensation

The cost of Workmen's Compensation protection is borne entirely by COMSAT.

If an employee's death is attributable to occupational causes, death benefits may be provided under state or local Workmen's Compensation laws.

All state compensation laws, except one, provide for payment of burial expenses up to a specified maximum amount. In several states, however, such benefits are restricted to cases where there are no dependents.

Death benefits generally are payable to the widow until remarriage and to children under a specified age. Benefit amounts are prescribed in accordance with state and local laws. A number of laws provide lump sums payable to a widow upon remarriage. If a maximum amount is not specified in the law, the amount payable is usually a percentage of an employee's wages modified by the number of dependents.

For more information on this subject, contact the Personnel office.

This concludes the discussion on death benefits.

If there are specific questions you would like to have answered on these topics, please direct them to the Manager, Employee Benefits.

The next article in this series will discuss the Corporation's "Medical Insurance Plan Benefits."



COMSAT Visits CATV Facility

Robert E. Button (left), COMSAT Director of Governmental Relations, and John L. Martin (right), Assistant Vice-President for Domestic and Aeronautical Satellite Systems, toured the facilities of Malden CableVision, a Massachusetts CATV system owned by TeleVision Communications Corporation. Hosting the visit was William R. Sinkunas, Vice President and General Manager of the group which operates the system.

SPEC System Developed by Labs Promises to Double Circuit Capacity

By J. A. Sciulli

In normal voice communications, one party is generally speaking while the other is listening. Therefore, each one-way channel is active less than 50 percent of the time. Hesitation and punctuating silence by the active speaker further reduces the average speech activity. In fact, for a large number of channels, the average usage per channel approaches only 25 to 30 percent.

This fact was recognized by the Bell System for years, and in the late 1950s, the Time Assignment Speech Interpolation (TASI) system was introduced. The TASI system exploits the statistical properties of multi-

channel voice communication to effectively double the capacity of submarine cables.

The difficulty with TASI-like systems is that when the call load increases and/or the speech activity is high, listeners begin to experience a degradation of service known as freezeout which is perceived by the subscriber as speech clipping or chopping. Speech clipping refers to the loss of words or parts of words which occurs when the total demand for speech channel time exceeds the channel capacity.

Uses Digital Techniques

A new COMSAT-developed system, employing digital techniques, also

See SPEC System, Page 15

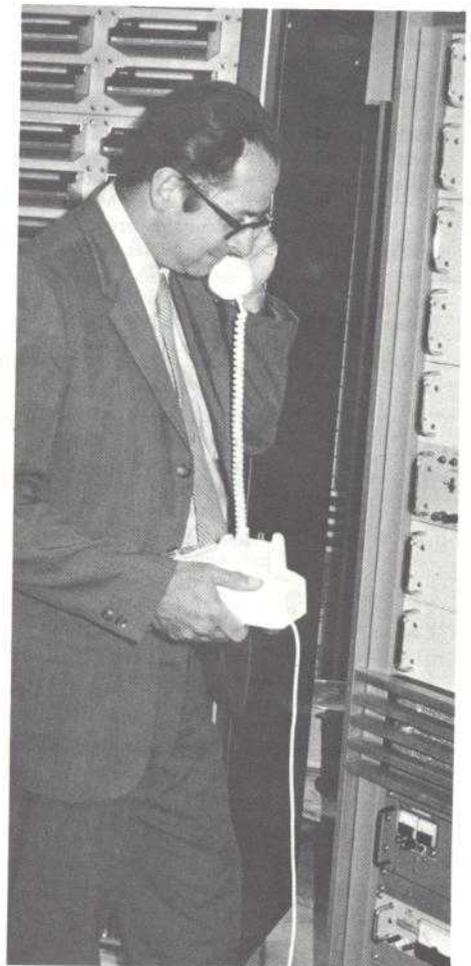
Mr. Sciulli is section head of the baseband processing branch, Communications Processing Lab.



Bob Ridings solders a printed circuit card for use in the SPEC system.



Paul Lutz, Ray Lanier and Joe Sciulli (left to right) check measurements.



Joe Campanella tests SPEC.

SPEC System

exploits the same statistical characteristics but in a different fashion. This system is referred to as Speech Predictive Encoding Compression (SPEC). It operates at the transmitter by removing redundant speech samples during talk bursts, as well as during silence intervals.

The receiver remembers the most recent sample transmitted through each channel. As long as a new sample is not transmitted the receiver simply repeats the sample value stored in its memory. In addition, the SPEC system examines each sample from each incoming trunk every 125 usec and determines those samples which must be transmitted and those that are redundant.

Because the SPEC system operates at this speed, and is able to predict redundant samples at the receiver, it produces none of the speech clipping effects typical of TASI-like systems. The characteristic degradation of the SPEC system due to increased call load and speech activity is manifested simply as an increase in noise power. To the listener, the degradation is similar to the quality of a PCM system as the error rate increases.

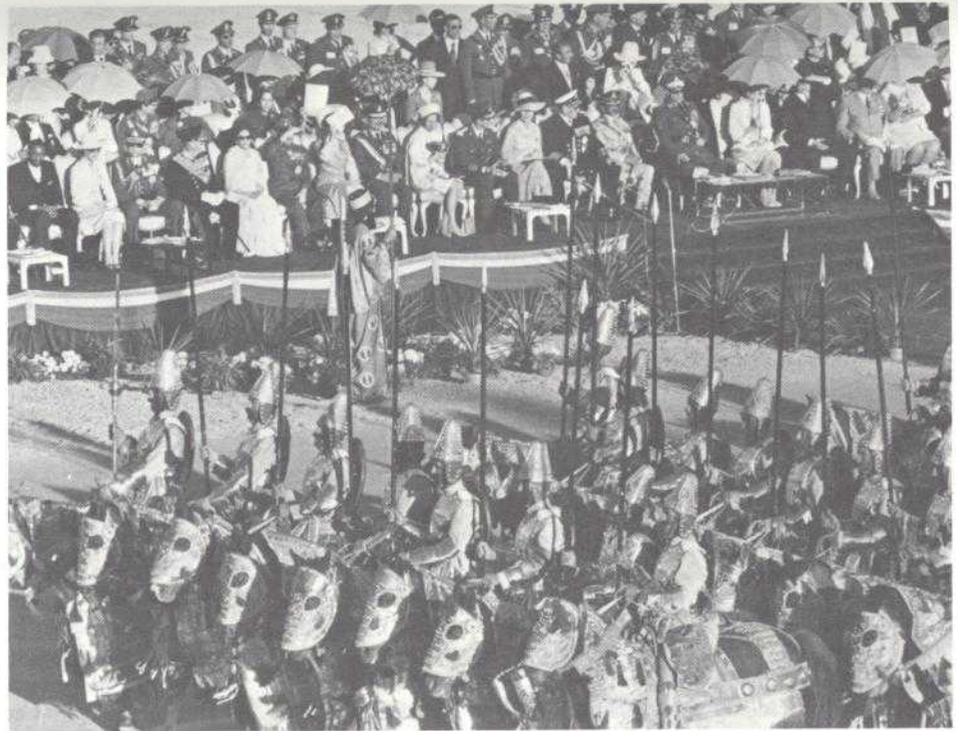
Prototype System

The concept of the SPEC systems was formulated in late 1969. Computer simulation results confirmed theoretical predictions in 1970. During 1971, the system design was completed and the development of a prototype system is now under way. This version of the SPEC concept is designed to accommodate the traffic of 64 PCM telephone trunks in the capacity of 32 PCM telephone channels.

The system should be completed before the end of this year and laboratory tests and evaluation should begin in December. The first public demonstration of SPEC will be at the IEEE Convention in March 1972 with a field test in late 1972.

Doubles Channel Capacity

The SPEC concept is capable of doubling the channel capacity capability of a time division multiple access system. This represents an increase from nominally 1,000 to 2,000 channels per INTELSAT IV transponder. The voice quality delivered by the SPEC system should be superior to that produced by TASI-like systems. It is estimated that the system can be commercially built at a cost of less than \$1,000 per circuit.



Iranian cavalymen in gold and silver armor during ceremonies in Persepolis celebrating the 2500th anniversary of the Persian Empire.

Via Double Hop

Iranian Celebration at Persepolis Viewed in More Than 50 Nations

Television viewers in more than 50 countries around the world witnessed the observance of the 2500th anniversary of Iran live from the huge tent encampment at Persepolis. Three INTELSAT satellites carried the coverage in color.

The ceremonies were seen in the United States during a special 90-minute segment of NBC's "Today" show. The coverage in the United States came via a "double hop" over two satellites. The distance covered by the television signals seen in the U.S. was more than 90,000 miles, which represented the mileage up and down to the two satellites and the necessary links by microwave and coaxial cables to New York.

Three overseas broadcast organizations were involved in the dissemination of the TV signals; National Iran TV; Office de Radiodiffusion Television Francaise, and in Japan, NHK Tokyo.

The coverage came to the United States from Persepolis by microwave to the earth station at Asadabad, Iran, up to the new INTELSAT IV satellite over the Atlantic Ocean, down to the French earth station at Pleumeur Bodou. There, the pictures were converted from the European standard of 625 scan lines to the 525 scan lines

used in the U.S. After conversion, the signals were sent to the U.S. earth station at Andover, Maine, through the INTELSAT III, F-7 satellite over the Atlantic and from there to NBC New York.

Japan received the coverage from the earth station at Asadabad, Iran through the INTELSAT III, F-3 stationed over the Indian Ocean to the Japanese earth station at Yamaguchi.

Both picture and color quality were reported to be excellent.

The worldwide coverage given this event accounted for 22:57 half-channel hours of global television service during October. For the entire month, global television service amounted to 235:42 half-channel hours of transmit time and 311:13 half-channel hours of receive time. This increased the 1971 total through October to 1216:10 half-channel hours of transmit time and 1665:52 half-channel hours of receive time.

Full-time circuit utilization of the satellite system by all users amounted to 5288, equivalent half-circuits at the end of October. COMSAT utilization was 2266 equivalent half-circuits.

Temporary service during October amounted to 1590 half-circuit days, increasing the cumulative total for 1971 to 37,040 half-circuit days.

Antenna Wash is Ready for Duty As Season's First Snowflakes Fall

By Imogene Cook

Winter has arrived! This fact was verified as the season's first snowflakes fell on the afternoon of October 26. The facilities engineer, Jim Erskine, said, however, that the antenna wash was ready to perform properly. This is a great relief to all of the personnel who labored hard and long to keep our antenna free from snow last winter.

Trick or Treat

Brewster CEA sponsored a Halloween party for all the COMSAT kiddies Saturday, October 30. The party was held at the Grange Hall in Brewster. Jim Peasley and Don Allen, senior technicians, assisted by their charming and capable wives, were in charge of this most bewitching event.

Thieves

A bitter blow was struck at Brewster as thieves recently broke into one of the buildings where our bathroom

and kitchen fixtures are stored. The thieves removed only the new fixtures, with many still in their shipping crates.

Bob Sanderson, electronic maintenance supervisor, now has obtained a ferocious animal to stand guard when he cannot be present.

Potpourri

Etam may have its hamburgers, but Brewster is strictly gourmet. All diets were cast to the winds when Dorothy Buckingham, assisted by Imogene Cook, recently prepared a savory Brunswick stew, in the manner of Old Mississippi. We are all looking forward to more expressions of these gourmet talents. Etam is welcome to borrow our recipes!

Dorothy Buckingham, our most efficient secretary, was on vacation for two weeks visiting with her parents in Mississippi. While she was away, Elizabeth Hashberger filled in as her replacement.

Ecós de la Montana

Falmar Victor, In CCEA Race

By Luis R. Rodriguez

Annual elections for the CCEA were held on October 1. The results were as follows: president, Frank J. Falmar; vice-president, Luis R. Rodriguez; secretary, Luis Medina; treasurer, Arsenio Reyes. Luis Maldonado will serve as the fifth member of the board.

To date the board has met twice to plan the year's activities. The first scheduled function will be our Christmas party to be held at Frank Falmar's home on December 10.

At Bartlett

CEA Plans Party On Snow Trails

By Jim Shaff & Patti McKenna

Talkeetna is blanketed with a foot of snow now, and the snowmobiles are out in full force. Much talk is heard about horse power, track size, hot versus cold plugs, and of course endless debate on the merits of the various brands.

Bartlett's CEA is planning a snow-machine party this month with trail riding, chow and hot buttered rums to ward off the chill.

Back Home

Bill Patterson recently returned from the Managers' meeting in Washington and reported the exchange of information was most interesting. After the hustle and bustle of the "big city", Bill enjoyed getting back to our "quiet roar."

Potpourri

Bartlett recently hosted the monthly meeting of the Anchorage and Fairbanks chapters of the IEEE.

The men finally vindicated themselves. Al Sousa and Larry McKenna bagged the biggest "gol-darned" moose you ever saw.

The Dewey Clay's unexpectedly became "pup parents" when their St. Bernard, "Angel", presented them with nine adorable babies. Complete with surgical gown, mask and rubber gloves, Dewey did a magnificent job, with Margaret as the "pupiatrician" in attendance.



Chilean President on 'Meet the Press'

The President of Chile, Sr. Salvador Allende, was featured on the "Meet the Press" television program of October 31, which was a two-way transmission between Washington, D. C., and Santiago, Chile, via the satellite system. The program was distributed nationally in the United States by NBC and was seen nationally in Chile also. "Meet the Press" panelists at the NBC studios in Washington interviewed Sr. Allende in Santiago. The Etam, W. Va., earth station and the Chilean station at Longovilo, as well as the Atlantic IV satellite, were used for the program.

Fall Colors Peak As Autumn Fades

By Betty Mowen

The area around COMSAT Labs has been a picture of reds, browns, and yellows, as the leaves turn and autumn nears its close. These days have been days of picnics on Sugarloaf Mountain or King's Pond, as well as strolls around the grounds at lunchtime. Several employees have been seen pitching horseshoes, playing basketball or jogging during the noon hour. As we prepare for winter here in Maryland, Judy Martin, who recently left the Labs, is trying her new skis on the slopes near Salt Lake City en route to California.

Trips, Trips

Speaking of journeys, Marie Curtis and son had one over our local area during their first plane ride last month. How nice to have a friend with a plane!

Tony and Maxine Buige did some traveling too during their trip to Florida, where they "sunned and funned" for 10 days.

Personnel

Jerry Holmes, cafeteria manager, has transferred to IBM, Bethesda, and has been replaced by Tom Lloyd. Welcome aboard, Tom, and remember, the way to an employee's heart is through his stomach.

Lyn Russell, Personnel, has been elected president of Montgomery County Chapter of the Society for Personnel Administration. Lyn will serve one year. The Montgomery County Chapter was formed four years ago with 12 members, and has grown to over 130 members today.

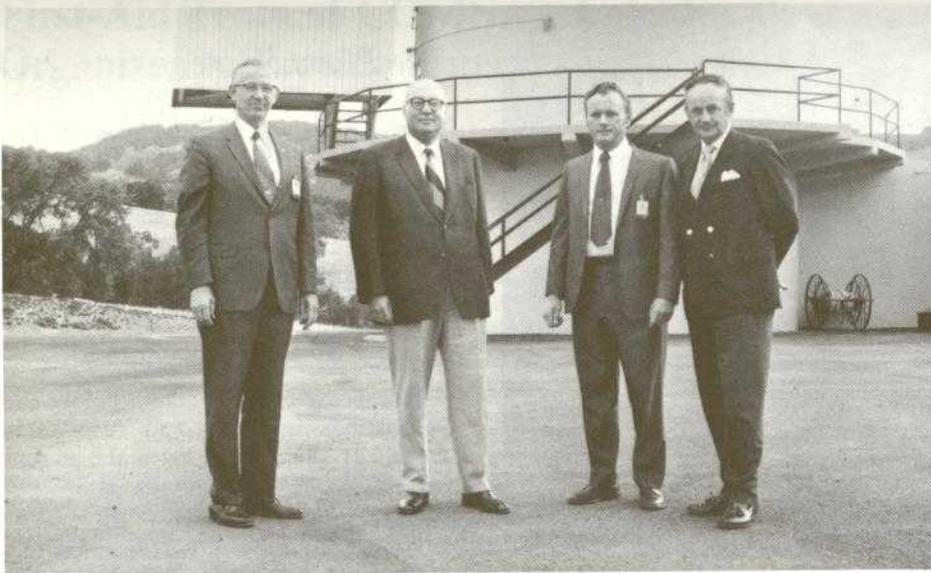
Wedding Bells

Russell Fang, Advanced Studies, will be married to Donna Ting on November 17, 1971, in Rockville, Maryland. After a Florida honeymoon, the couple will make their home in Gaithersburg, Maryland.

The new Mrs. Eli Waschberg was guest of honor at a wedding shower given by Sam Reiser and Tony Friedman on October 10, 1971. The guest enjoyed lunch and Mickie received many practical as well as beautiful gifts.

Potpourri

Our second Red Cross First Aid course was held October 19 though October 22 and was very successful.



John P. Scroggs, station manager, and Michael J. Downey, assistant station manager, welcome Joseph H. McConnell and Dr. Joseph V. Charyk to Jamesburg. Left to right: Mr. Scroggs, Mr. McConnell, Mr. Downey, Dr. Charyk.

News and Notes from Jamesburg

McConnell, Charyk Visit Station, Observe Emergency Power Plan

By M. Lee Dorsey

Joseph H. McConnell, Chairman of COMSAT's Board of Directors, and Dr. Joseph V. Charyk, COMSAT President, honored the Jamesburg station with a visit on October 22. All of the staff enjoyed meeting Mr. McConnell for the first time, and again welcoming Dr. Charyk to Jamesburg.

Usually when we have Dr. Charyk for a visit, the station is running like a Swiss watch. However, this time when Mr. McConnell and Dr. Charyk arrived, we were experiencing a state of power emergency. Both the diesel generator and two UPS modules were out of service.

Earlier in the week, the UPS (Uninterrupted Power System) really gave up. All modules had one or more faults. Our facilities and electronics maintenance personnel worked practically around-the-clock, trouble-shooting the UPS. The station was placed on the diesel generator while the UPS was down. Then the diesel had to be taken out of service as a hydraulic valve lifter failed.

The Waukesha Company sent in a field representative to evaluate the situation and direct repairs. In the interim, while the standby diesel was down, a portable 175 kW diesel generator was rented and set up in case our primary source of power should fail. Fortunately, our crew was able to keep one UPS module running by turning down the beam current on the off-line HPA (high power amplifier). This gave battery backup. During this time, our primary source of power was as steady as a rock and not one traffic outage was experienced.

Civic Affairs

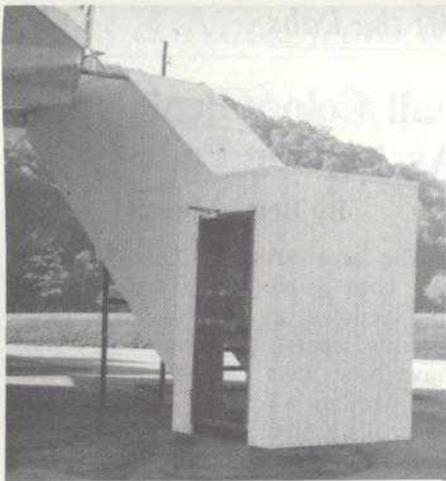
Station manager, John P. Scroggs, was installed as president of the Carmel Valley Kiwanis Club. Mr. Scroggs' term will run from 1971 through 1972.

Blood Bank Grows

One year ago, the Jamesburg earth station started a blood bank for all station employees and their families. To date, 31 units of blood have been donated.

Earth Station Tests

Dr. Michael Olson and Dr. Michael Sites of Stanford University are testing equipment for use in an unmanned geophysical observatory to be located in Antarctica. The unmanned station is a project of the National Science Foundation and, if all proves successful, will greatly reduce the cost and hazard of collecting scientific data by decreasing the need for small manned stations, particularly in polar regions.



Etam's sheltered antenna entrance.



Gus Souris briefs seminar visitors.

The Plaza Scene

Staff at Plaza Catches Breath in Calm Before Yule

By Harriet Biddle

It appears to be the calm before the "Christmas and year-end rush" this month at the Plaza. With the exception of the excitement caused by the Redskin's winning streak, all is relatively quiet around here and "business as usual" seems to pervade the scene.

In our new Domestic and Aeronautical Satellite Systems office, Vivian Trainor was quite busy rehearsing nights for "Bye Bye Birdie", which was presented by the Arlington Players at Thomas Jefferson High School on Friday and Saturday nights the first three weekends in November. Vivian played the piano in a combo which provided the background music for the show.

Departures and Events

Wedding bells will soon be ringing for our Headquarters librarian, Elizabeth Preston, who is planning to be married on January 1 at Christ Episcopal Church in Georgetown. The lucky fellow is Juan Belt, who is presently working on his Ph.D. program at Cornell University in Ithaca, New York. She plans to join Juan in Ithaca following the wedding so we will miss seeing her. Best wishes to you, Elizabeth, from all of us.

Anne Corcoran, Management Review and Coordination will soon be leaving COMSAT to attend law school in New Jersey. Good luck, Anne, in your new career.

Two fortunate "Plazateers" made the international scene recently. Juanita Cellini, Information, spent two glorious weeks vacationing in Rome, and Gay Coletto, International, made an exciting three-week jaunt through five European countries—England, France, Germany, Switzerland, and Italy. This was Gay's second visit to Europe and she is now looking forward to a western U.S. trip.

If you happen to see Walt Kutrip, Personnel, passing out cigars and grinning broadly, it is because he is celebrating the birth of an 8-pound son, Steven October 28.

See Scene, Page 20

News and Notes from Etam

Initial SPADE Training Begins, Zarecor, O'Hara Are Instructors

By Deloris Goodwin

Will Zarecor from Headquarters arrived at Etam late in October to begin making preparations for the first phase of the SPADE training. One man from each of the operating shifts, plus two others from the electronic maintenance shop were assigned to this initial phase, which began on November 1, and continued for several weeks. Mike O'Hara has started the second phase of training and will cover the operation and maintenance of the equipment.

Personnel Notes

Three employees at Etam were presented their five-year awards by William Carroll, Station Manager, during September. They were Bob Leard, Jim Evans, and Mike O'Hara. They all have one thing in common—they began their COMSAT careers at Andover. Both Jim and Bob were hired on September 19, 1966, and Mike started to work one week later on September 26, 1966. Mike was only recently transferred to Etam, although

he has been on our payroll since January 1. Congratulations are extended to all three.

Henry Bulk, material control specialist, and wife, Marge, have just moved into their newly constructed home located in the Sanders addition to Kingwood.

Don Gaston has purchased a new 12-foot-by-65-foot mobile home and is in the process of getting it set up so that he can move into it soon.

Graduation Day

Navy Petty Officer Third Class David N. Bulk, son of Henry and Marge Bulk of Kingwood, has graduated from the Advanced First-Term Aviation Electronics Course, Class B, at the Naval Air Technical Training Center, Millington, Tennessee.

During the 26-week course, he studied mathematics and physics, principles of electronics, computers, principles of transmission and reception, airborne radar and navigation systems, and avionics maintenance.

Dave recently spent a two-week leave with his parents prior to his new duty assignment at Patuxent Naval Air Test Center in Patuxent, Maryland.

Potpourri

Bill Mayes received the September safety award at Etam. He suggested that the NEC power plugs installed on the equipment located at the GCE console area be polarized. However, his glory was short lived, as within two weeks after reception of this award, he received the "Drazah Ytefas" award for leaving a soldering iron unattended on the work bench and not placed in a holder. This resulted in the destruction of one of Paul Helfgott's colorful neckties.

Our facilities crew during the past month fabricated and installed a new security entrance to the stairwell leading to the second level of the antenna. This will allow the station to control access to the upper portions of the antenna, especially when there are tours on station.

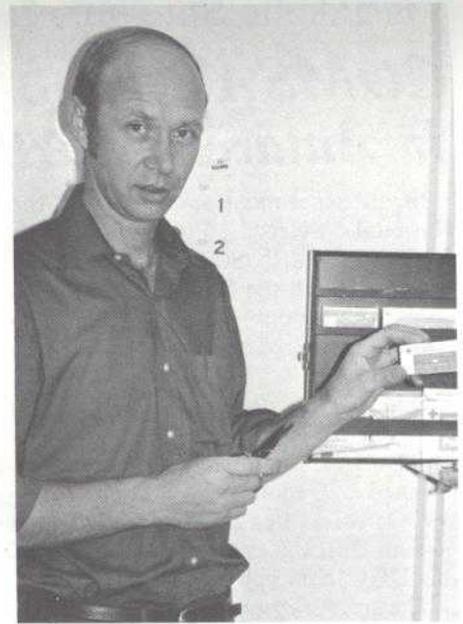
First-Aid Team of COMSAT Labs Employees Organizes to Provide Emergency Assistance

A group of volunteer "first-aiders" is providing valuable back-up assistance these days to the Labs Health Unit Nurse, Betty Mowen.

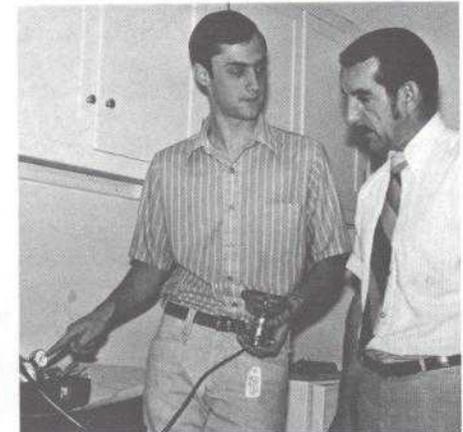
Working with a nucleus of six trained men, Mrs. Mowen has developed a procedure whereby emergency aid can be provided to any COMSAT Labs employee in a matter of minutes.

Should an emergency arise, her team members would report to Mrs. Mowen, upon the first ringing of the fire alarm bell, to provide help as needed.

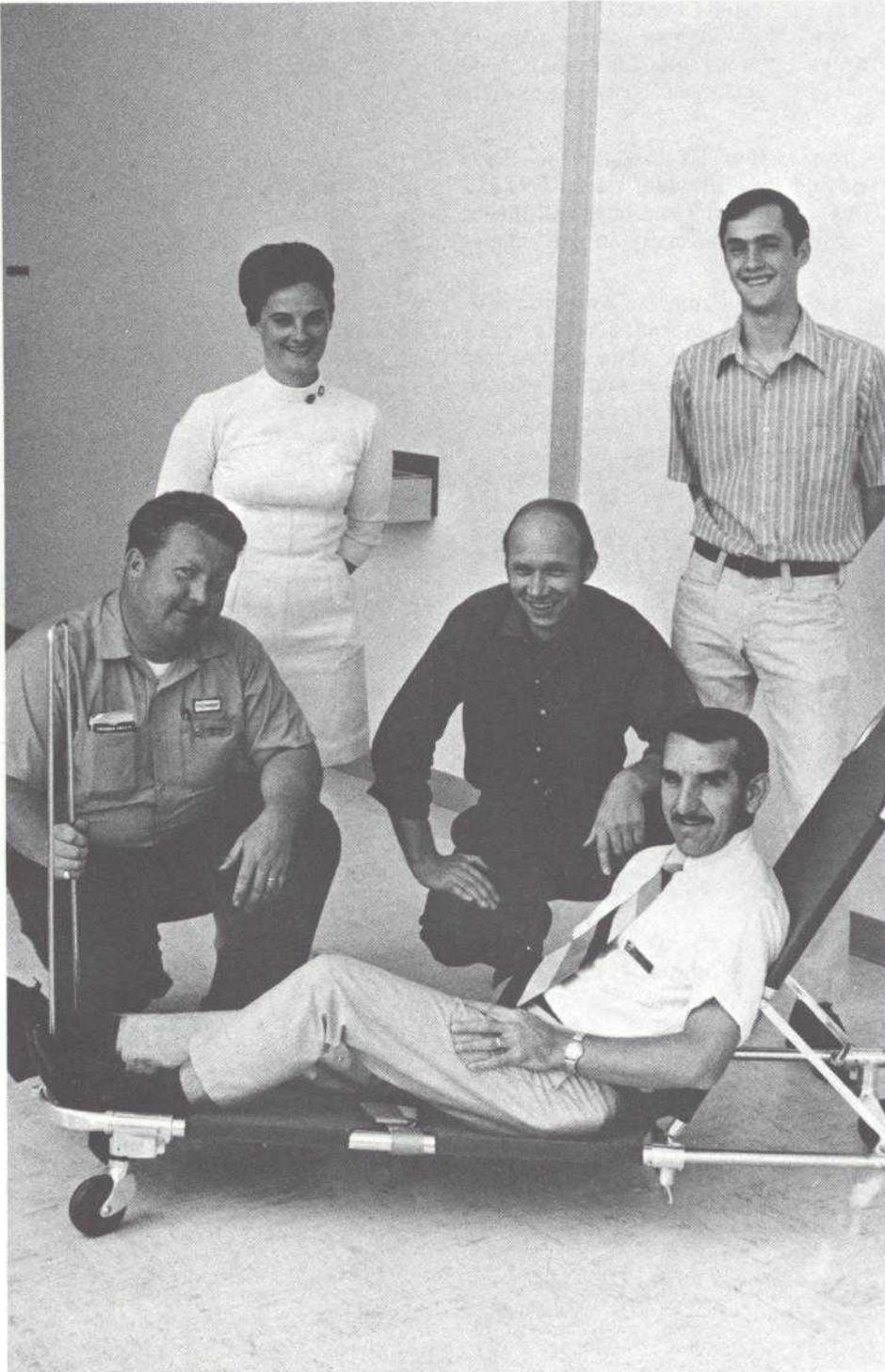
Mrs. Mowen said she felt very much alone before her team was functioning. Today, however, with their support she is in a far better position to provide quick and efficient emergency aid when needed.



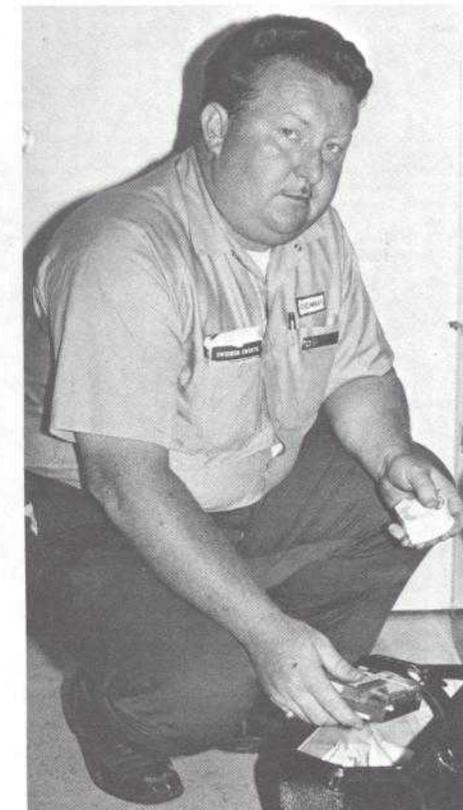
Howard Hobbs checks after-hours kit.



Bill Magers (left) and Blaine Shatzer test the portable resuscitator.



The first-aid team, made up of (left to right) Larry Pearce, Blaine Shatzer, Howard Hobbs, and Bill Magers with Labs Nurse Betty Mowen.



Larry Pearce restocks emergency bag.

Via Pacific Satellite

COMSAT and Stanford Cooperate In Antarctic Earth Station Tests

In an experiment sponsored by the National Science Foundation, the Jamesburg Earth Station has been cooperating with the Stanford Center for Radar Astronomy in testing an unattended meteorological station in the Antarctic.

One of the conditions set by the ICSC in its approval of the use of the INTELSAT network by the Unmanned Geophysical Observatory (UGO) was a demonstration using the 16-foot antenna at L'Enfant Plaza of the UGO communications equipment.

The primary purpose of this demonstration was to ensure that operation of the Antarctic station will not interfere with normal INTELSAT operation. A secondary goal was to verify that error rates on the data link were sufficiently low for satisfactory reception of scientific data collected by the Antarctic station.

Both of these goals were met during the tests, which were conducted at the Plaza by engineers from COM-

SAT's Special Projects office and Stanford.

The initial prototype antenna is now at Jamesburg undergoing tests with the Pacific INTELSAT III satellite prior to its shipment to the Antarctic.

The antenna was shipped on November 5, aboard a C-141 Star-Lifter. The Military Air Lift Command delivered the antenna to the test site in the Antarctic about a week later.

Much of December will be spent in readying the antenna for operation by Stanford personnel at the Antarctic site.

The station is scheduled to begin relaying scientific data via an INTELSAT satellite to Jamesburg and thence to Stanford University in early January.

The channel from the Antarctic is to be used for the transmission of a variety of scientific data while the channel back to the unmanned station will be used for station control purposes.



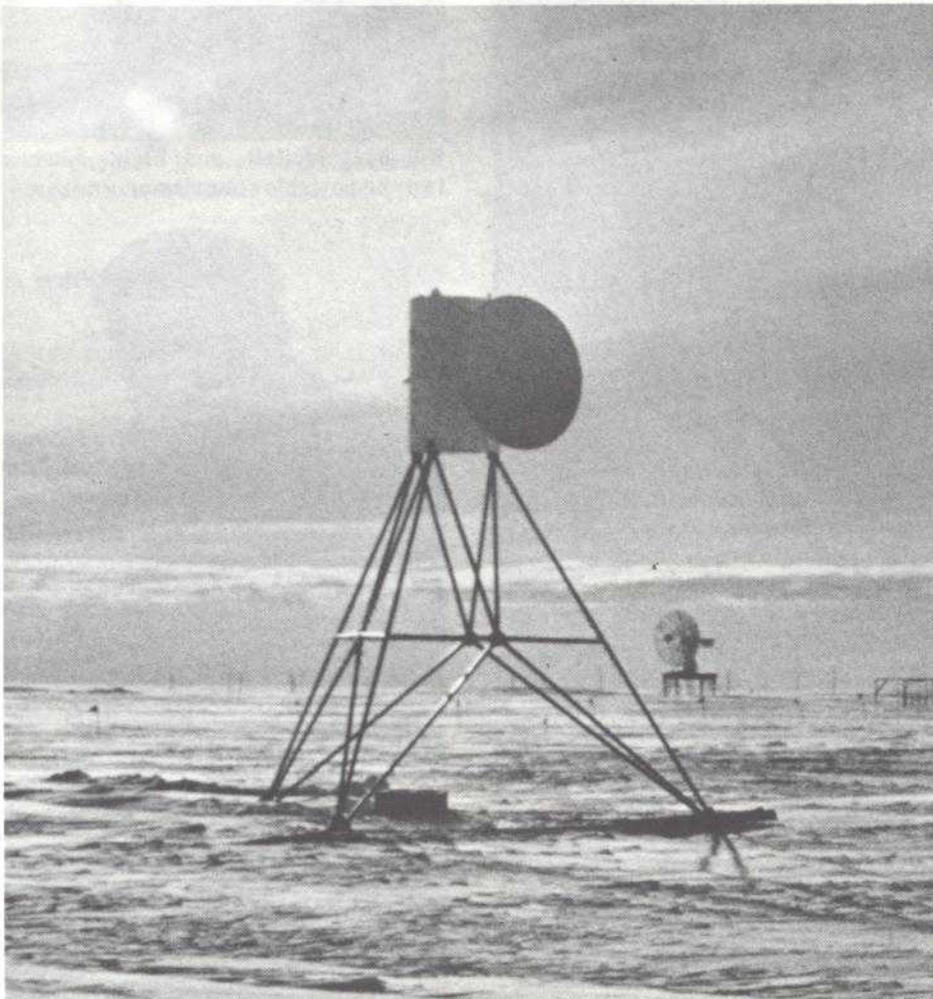
The antenna receives a final check.

From Page 18 Scene

Jackie McGill, Personnel, is excited about her husband's new venture. He has opened a novelty store on Pitt Street in Tavern Square, Alexandria, Virginia. All goods are handmade, from arts and crafts, to paintings, to furniture—you name it. You might want to stop by for some unique Christmas gifts or just to browse. Also, if you know anyone who makes things to sell, John may well be interested in hearing about it. Sounds like an interesting endeavor, Jackie and John. We hope the store will be a booming success.

Basketball Team

The inside news on COMSAT's girl's basketball team, known as the Long Shots (although Short Shots might be more appropriate, judging from last year's performance) is that Coach Tyrone Ricks plans to use a double-team strategy this year—the "Go" team and the "Went" team. The "Went" team has been practicing hard for the new season which begins in mid-December, but members for the "Go" team are still needed. So if you are female, know how to dribble a basketball, and can hoop a few baskets, join up.



The antenna, on site in the Antarctic, is prepared for service.

72 8600

COMSAT NEWS

February 1972



**Jamesburg: focus
for news flow out
of China on Nixon
visit — page 8**

COMSAT NEWS

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On the cover

Hello, Peking: The Jamesburg earth station will be the U.S. terminal for TV, telephone, press messages and photos via satellite during President Nixon's trip to the Peoples Republic of China, starting February 21. The station, about 30 miles up the Carmel Valley from Monterey in central California, also is heavily booked to handle more than 50 hours of TV coverage from Japan of the Winter Olympics during the first half of February.

February 1972—7th Year, No. 1

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Matthew Gordon, Assistant Vice President for Public Information

James H. Kilcoyne, Jr., Editor

Manned workshop in orbit: new role for communications

By JOHN J. PETERSON

With the concluding flights of Apollos 16 and 17 in 1972, America's manned exploratory flights to the moon will reach their climactic end, and the global satellite system will have played a major role in bringing to worldwide audiences some of the most widely shared events in history.

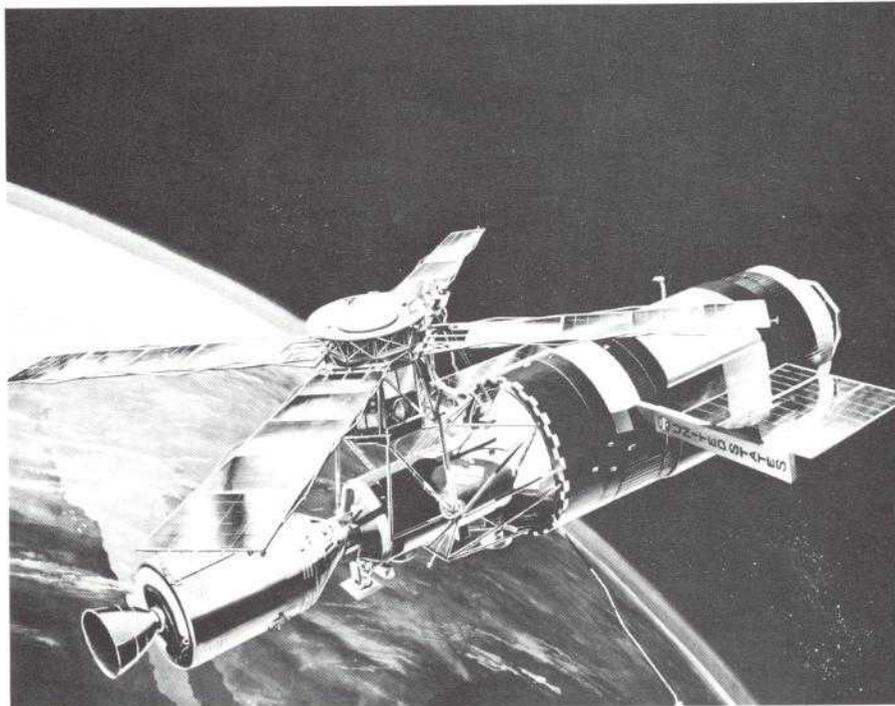
But the completion of the Apollo missions does not mean the end of COMSAT communications support for NASA programs.

The year 1973 will be the year of Skylab. Although the drama of televised space exploration will be absent, at least as compared to Apollo, COMSAT and the global satellite system will continue to play a key supporting role in NASA's Manned Space Flight Network. The global system will assist in relaying from Skylab earth-orbiting spacecraft to the Manned Spacecraft Center in Houston, Texas, a flow of scientific data in quantities staggering to the minds of laymen. The volume will keep scientists busy for years to come.

William C. Schneider, NASA Skylab Program Director, describes Skylab, America's first earth-orbiting space laboratory, as a program "designed to conduct scientific, technological, and biomedical investigations from the vantage point of space. The program will test earth resources remote sensing equipment and techniques to gather information on earth's ecology, oceanography, water management, agriculture, forestry and geography. Skylab astronomy experiments will substantially increase knowledge of the sun and its effects on man's existence on earth. Experiments scheduled for Skylab will also further evaluate man's capabilities in space flight."

Astronaut-Scientist Dr. Joseph P. Kerwin (Cdr., Navy Medical Corps)

Mr. Peterson is a COMSAT information officer.



The Skylab cluster will be the largest space vehicle ever placed in orbit.

of the Houston Manned Spacecraft Center (MSC) notes the uncertainty over man's ability to live and operate efficiently while on extended space flights, especially his ability to adjust or adapt to the new environment and to maintain adequate performance there.

Upon the completion of the Apollo missions in 1972, will the satellite system no longer provide vital communications support services to NASA? The answer seems to be a vigorous No, as NASA moves toward one of its most exciting and productive programs—Skylab.

"Answers to this concern about man," states Dr. Kerwin, "can be obtained only through a careful quantitative assessment of the crew and their performance while working. The study of the flight events must develop data on the trends or rates of adjustments as they are occurring as well as an overall assessment of the crew-

men's status and performance at any one point during the flight. Interpretation of data depends on comparing flight results with a data base obtained in ground laboratories. Such a combination of ground and in-flight experimentation forms the basic plan for the Skylab biomedical program."

Of the 14 stations of the Manned Space Flight Network supporting the Skylab missions, 50 percent will utilize the satellite capability: Ascension Island, Carnarvon, Grand Canary, Guam, Hawaii, Honeysuckle Creek and Madrid.

MSC communication officials say more than half of the data returned to Houston will be carried over the Atlantic and Pacific Ocean satellites to the COMSAT-operated earth stations at Etam, West Virginia, and Jamesburg, California, for routing through the Goddard Space Center at Greenbelt, Maryland, to Houston, Texas.

Ernest L. Randall of the MSC Flight Support Division's Operations Integration Branch, and formerly Chief Network Controller for Projects Gemini and Apollo, who spearheads operational planning for Skylab, states concisely, "In Skylab, emphasis will be placed on data."

Randall, and NASA communications specialists such as Charles

Busch, Chuck Ritchie and their co-workers, measure manned flights in terms of "Apollo years" and the "Skylab Year" for comparison purposes.

The Apollo Year, says Randall, consists of two Apollo flights with a total of approximately 6,000 voice and data communications hours. The Skylab Year will encompass the nine-month period of 1973 during which the three manned flights will take place and will yield an estimated 25,000 hours of voice and data communications.

Although the Skylab spacecraft will carry both color and black and white television cameras, TV coverage of the flights will not be of the glamour type the public has become familiar with during Apollo.

Present planning calls for reception of black and white TV at the different sites in the Manned Flight Network, to be put on tapes and returned to Houston. Color TV will be carried to earth only while the spacecraft is in communication with NASA tracking stations at Goldstone, California, and Cape Kennedy, Florida, for return to Houston. Although color conversion of such photography is available only through Houston facilities, Goldstone and the Cape will have the capacity to monitor in black and white. And it is only from Houston that color television of flight sequences can be made available to the news media.

Actual TV coverage of mission sequences, although presently planned only while over the continental United States, is an unknown factor at this early stage. Events during actual missions could create needs not presently foreseen.

Actually, according to the space scientists, 95 percent of the filming returned to the ground will seem a "blurry glob" to most viewers.

The emphasis in Skylab will be on the return of data—huge quantities of it.

As pointed out by Randall, however, whereas during Apollo, even though satellite circuits carried voice and telemetry data, emphasis was on television coverage, emphasis during

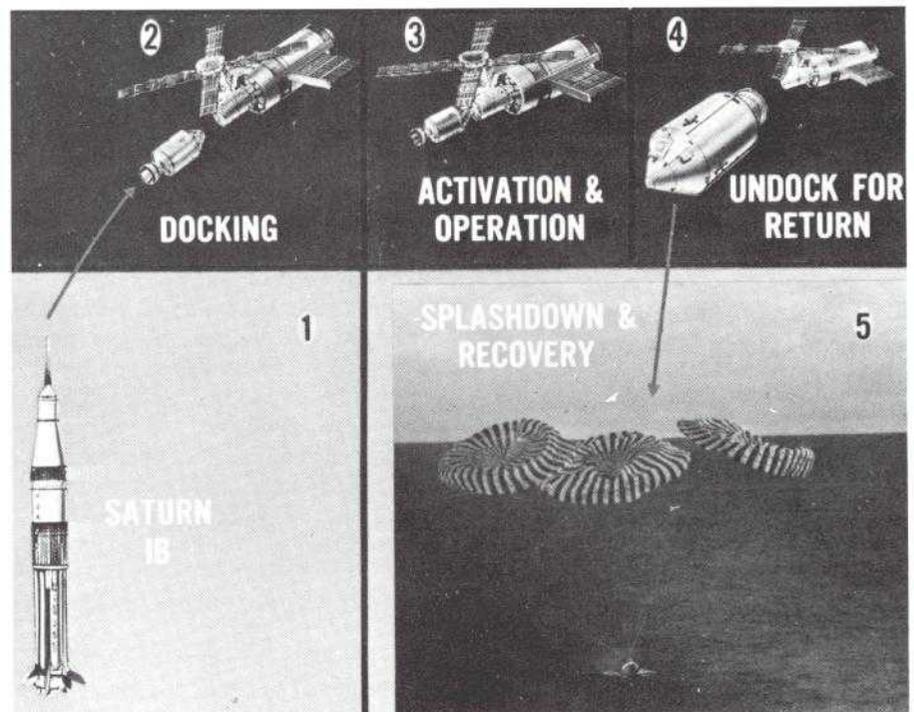
Skylab will be on the return of data.

During the 90-minute, 270-mile-high, circular orbits, the spacecraft will constantly generate data to be recorded at tracking stations or stored in the spacecraft and transmitted during periods of acquisition by ground stations.

The spacecraft will utilize eight down links to ground stations in the Manned Space Flight Network: two data links from the Apollo telescope mount, two data links and one voice link from the command module and three data links from the air lock module.

the sun, particularly during periods of solar flare activity. Films for the ATM record of solar behavior will be periodically installed and retrieved by an astronaut from outside the spacecraft during extravehicular activity.

A pressurized passageway is provided between the multiple docking adapter (MDA) and the orbital workshop (OWS). The airlock module, in addition to enabling an astronaut to exit from and return into the spacecraft, is also the supply, distribution and control center for cluster atmosphere and thermal control. In ad-



About 24 hours after launch, a Saturn 1B will lift the crew into earth orbit for docking.

Ground stations will have available a total of four up links to the spacecraft: three command links, one each to the Apollo telescope mount, the air lock and the command module, and one voice link to the command module.

NASA officials agree that because of the reliability factor continued emphasis will be placed on the use of communications satellites to relay voice and data between the NASA tracking stations and Houston.

The Apollo telescope mount (ATM) is a solar observatory with the capability to observe, monitor and record the structure and behavior of

dition, it contains the equipment for electric power control and distribution to the orbital workshop, multiple docking adapter and airlock module.

The airlock module is also a key communications junction since it provides support for cluster communications and data handling including delayed-time voice communications with the ground.

The command and service module is almost identical to that used for Apollo with modifications to accommodate the long-duration Skylab missions. The CSM, although semi-dormant while docked with the orbital workshop, serves as the nerve center

Some views from 'Sky Chief' Conrad

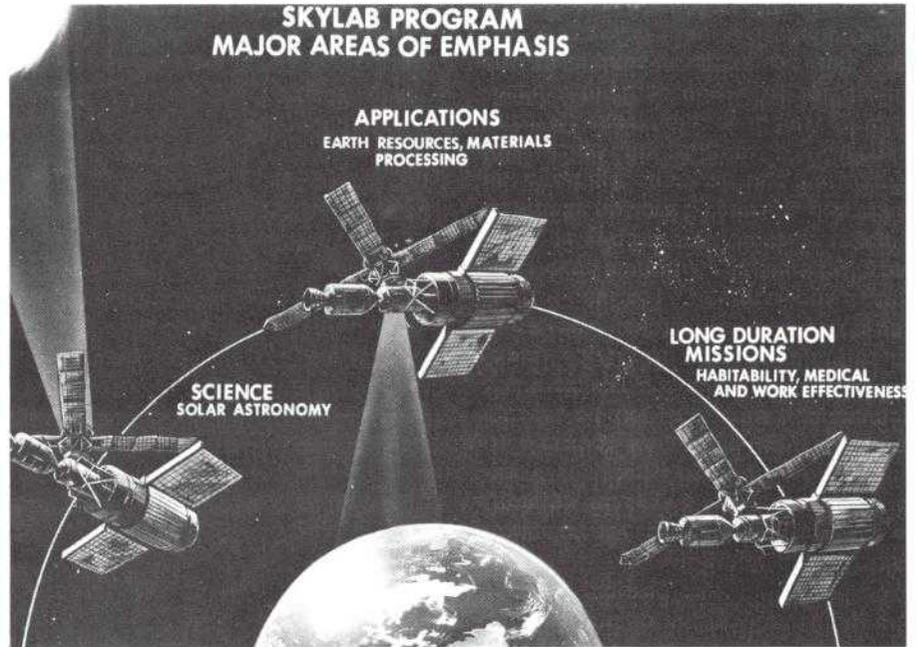
Astronaut Charles "Pete" Conrad, Jr., veteran of the Gemini 5 and 11 flights and Apollo 12, heads up the Skylab Program for the Astronauts and is good-naturedly referred to as "Sky Chief."

He recently made these observations to Mr. Peterson:

"First, I think that we must define the term 'astronaut.' When Project Mercury was conceived, only test pilots were required as man was extending the flight envelope. It later became apparent that operating in space was going to generate a new requirement for man, and that he would be required to test and operate the vehicle for other purposes. Therefore, besides test pilots, we selected pilots and scientists to work as astronauts. These people then cross-trained in such a manner as to lose their individual background and become astronauts. In Gemini we studied scientific phenomena about our atmosphere so that we could operate weather, astronomical and earth-resource oriented experiments. In the Apollo program, we trained to test the feasibility to land on the moon and at the same time trained in lunar geology and other sciences.

"In Skylab, we are training to learn to operate a space station and use it to gain knowledge of our sun, earth resources, and other scientific data from space.

"When the space shuttle becomes operational, I think the term "astronaut" will become obsolete. Test pilots will test it and turn it over to operational pilots who will take the payload up and down from orbit. These payloads will be manned, unmanned and mixed. The manned payloads and mixed will be the pure scientist and his experiments or technical-type people who will service, repair or install in space functional satellites."



The astronaut crews will carry out many experiments in earth orbit with much of the data being returned to earth via satellite.

for the transmission of monitoring and experimental data relayed from the workshop by means of an intercom system. The workshop houses most of the experiments, provides two solar array wings for power generation, and has complete crew quarters and accommodations for sleeping, eating and housekeeping during mission operations.

Skylab launches will be in two phases. Initially, the Saturn workshop (SWS) configuration consisting of a S-IV stage modified into an orbital workshop, an airlock module, a multiple docking adapter (MDA), a Saturn V instrument unit (IU), an Apollo telescope mount and an ATM deployment assembly, will be launched unmanned from the Cape Kennedy Complex 39A by a two-stage Saturn V. The command and service module will be launched almost 24 hours later from Complex 39B on a Saturn 1B carrying its three-man crew into an elliptical orbit for positioning and rendezvous with the Saturn workshop.

A very demanding requirement being placed on the Manned Space Flight Network is that all non-redundant data received from the orbiting spacecraft clear receiving ground stations and be returned to the Manned Spacecraft Center in Houston through the Goddard Space

Flight Center within 90 minutes. This allows each new orbit to begin with a "clean slate" ground station capability. According to MSC's Randall, "It is imperative that a buildup of data not develop."

"... NASA officials agree that because of the reliability factor continued emphasis will be placed on the use of communications satellites..."

The Saturn workshop configuration will have the capability to transmit at a maximum rate of 176,000 bits of information per second during ground station acquisition of signal. Since the workshop will be in real-time communication with the ground network only an estimated 25 percent of the time, real-time and stored data transmitting must take place during ground station acquisitions.

Although the Manned Space Flight Network supporting the missions includes 14 stations, the workshop will be in direct communication with each station for an average of only eight minutes per orbit.

Receiving ground stations have a four-circuit transmit capability to

Houston MSC through Goddard. Three of the circuits will carry telemetry with the "back sides" of the circuits used for command links to the workshops. One circuit will be used one-way for biomedical data. Each circuit will have a transmit capability of 7.2 kilobits per second for a total maximum capability of 28.8 kilobits.

Data received at Goddard will be transmitted to the Manned Spacecraft Center on two 50-kilobit links with a 50-kilobit link as a backup to the MSC computers for data readout.

Tentative scheduling of the Skylab Year includes one 28-day mission in April 1973 and two 56-day missions the following July and October. Each crew will consist of three astronauts.

Mass carried live via IV satellite

The Christmas celebration by Pope Paul VI in the Vatican was carried live via satellite to TV stations throughout the world.

The religious observance was relayed from Rome via the INTELSAT IV satellite to Puerto Rico, Brazil, Venezuela, Mexico, Zaire Republic (formerly the Congo), Panama and Colombia.

In the United States, the Midnight Mass from St. Peter's was received by the Etam, West Virginia, earth station. From Etam, it was transmitted by terrestrial facilities to television station WXTV in Paterson, New Jersey, for distribution in the greater New York City area.

The worldwide coverage given this event accounted for 24:22 half-channel hours of global television service during December.

For the entire month of December global television service amounted to 158:59 half-channel hours of transmit time and 187:54 half-channel hours of receive time. This increased the 1971 total through December to 1,519:55 half-channel hours of transmit time and 2,043:07 half-channel hours of receive time.

Full-time circuit utilization of the satellite system by all users amounted to 5,836 equivalent half-circuits.



William B. Lockett, program coordinator, briefs SOC instructors at COMSAT.

Minority training provided by SOC

By WILLIAM B. LOCKETT

COMSAT, in cooperation with the Secretarial Opportunities Consortium (more commonly known as SOC), a delegate agency of the Department of Labor, will again provide on-the-job secretarial training for a group of minority young women from the Washington metropolitan area in the coming months.

The program, which began on January 17, is designed to afford these young women the opportunity to utilize previously acquired classroom training through exposure to an actual work environment under the guidance of an experienced secretary.

Training is being conducted at 15 worksites throughout the Corporation, using a "buddy system" with regular Corporation secretaries serving as instructors or buddies.

Since its inception three years ago, 37 of the 42 students completing the program have gone on to full-time employment in the secretarial and

Mr. Lockett is a personnel representative in the Personnel office.

clerical field. The program is considered by many to be the most effective and successful training program of its kind in the Washington area.

Miss Mary Wolf, the originator of this training concept, is now directing a sister project which recently began in New York City.

The Washington program is now operated under the auspices of the District of Columbia Board of Education and the Department of Labor and is directed by Mrs. Laura Welton, a former COMSAT employee.

Antenna study to RCA

COMSAT on behalf of INTELSAT proposes to award a \$97,891 contract to RCA Limited of Quebec, Canada, for a multibeam antenna isolation study. The study is to be completed in eleven months.

About this issue: As a step toward providing a more interesting and authoritative chronicle of COMSAT activities, the format of the COMSAT News is being changed beginning with this issue. We hope readers will like the improvement.

—The Editor.



PHOTOS BY ALLAN GOLFUND

Hungarian Diplomats Visit Headquarters

Three diplomatic representatives of the Hungarian People's Republic recently visited Headquarters.

Shown in the picture at the left are (left to right) Dr. Imre Komives, Ambassador to the United Nations; Mr. Karoly Csatorday, Deputy Foreign Minister, being greeted by Dr. J. V. Charyk, COMSAT President; and Dr. Karoly Szabo, Ambassador to the United States.

In the picture at the right, Matthew Gordon, Assistant Vice President for Public Information, makes a point as he explains the global system to the visitors.

No rate cut seen for early 1972

COMSAT, in response to an inquiry from the Federal Communications Commission, said recently that the Corporation does not plan a second stage rate reduction in the beginning of 1972. Such a reduction was conditionally proposed last May when COMSAT announced a first stage cut in its Atlantic basin rates.

In a letter to FCC Common Carrier Bureau Chief Bernard Strassburg, dated December 29, COMSAT President Joseph V. Charyk pointed to the failure of last May's premises to be realized.

The letter said that year-end communications satellite traffic levels fell

substantially short of the carrier-customers' forecasts of last summer. It also pointed to continuing uncertainties with regard to plans for traffic sharing between undersea cables and satellites, and to the need for protecting Atlantic area satellite capability by the successful launch of another of the INTELSAT IV series of satellites in the new year.

Dr. Charyk said that until the "uncertainties about the future utilization of satellite service are clarified, COMSAT cannot in good conscience reach a firm position relative to a rate reduction action."

Dr. Charyk concluded by expressing the hope that "these grave problems (could be) resolved quickly so that the stage can be set at the earliest possible time for a rate reduction similar to that previously contemplated."

Solar cell study

COMSAT on behalf of INTEL-SAT proposes to award a contract to Ion Physics Corporation, Burlington, Massachusetts, for a solar cell rear incidence damage study for application to future communication satellites utilizing deployed arrays. The \$48,000 contract is to be completed within nine months.

COMSAT Dividend

The Board of Directors at its meeting on January 21 declared the regular quarterly dividend (COMSAT's sixth) of 12½ cents a share, payable March 13, 1972, to all shareholders of record as of February 11, 1972.

Nixon in China: biggest TV event since Apollo 11?

The satellite system will be the primary mode to handle the anticipated heavy flow of communications—press messages, voice and television—for President Nixon's visit in February to the Peoples Republic of China.

Preliminary arrangements were made for the Presidential trip by an advance-party of U.S. communications officials and White House representatives who visited China in January.

COMSAT Vice President-Operations George P. Sampson was a member of the advance party which visited Peking, Hangchow and Shanghai, the

same three cities the President is to tour.

COMSAT will serve as system manager for the satellite communications from China.

Although some details of the Presidential party's visit are still to come, the COMSAT-operated Jamesburg earth station in California and the INTELSAT IV satellite over the Pacific will serve as the links for direct U.S.-to-Peoples Republic communications.

A small transportable earth station with a 24-foot diameter antenna, the same facility used in Iran at Persepolis for the 2500th Persian anniversary extravaganza, is being erected near Peking to transmit and receive the communications from the Peoples Republic.

The White House said the Peoples Republic is arranging for installation and operation of the small station. It

will be the first time that country, which has the world's largest population, has accessed the global satellite system for international communications.

George Lawler, COMSAT Marketing Director, along with representatives of the other international U.S. carriers, will be part of another advance group of operational and technical U.S. personnel who will leave for China on February 1 to make further preparations for the President's visit.

The advance party of Americans was received "with great hospitality" by the Chinese, who showed great professional skill as well as understanding of the unprecedented interest in the President's visit.

—Ron Zeigler.

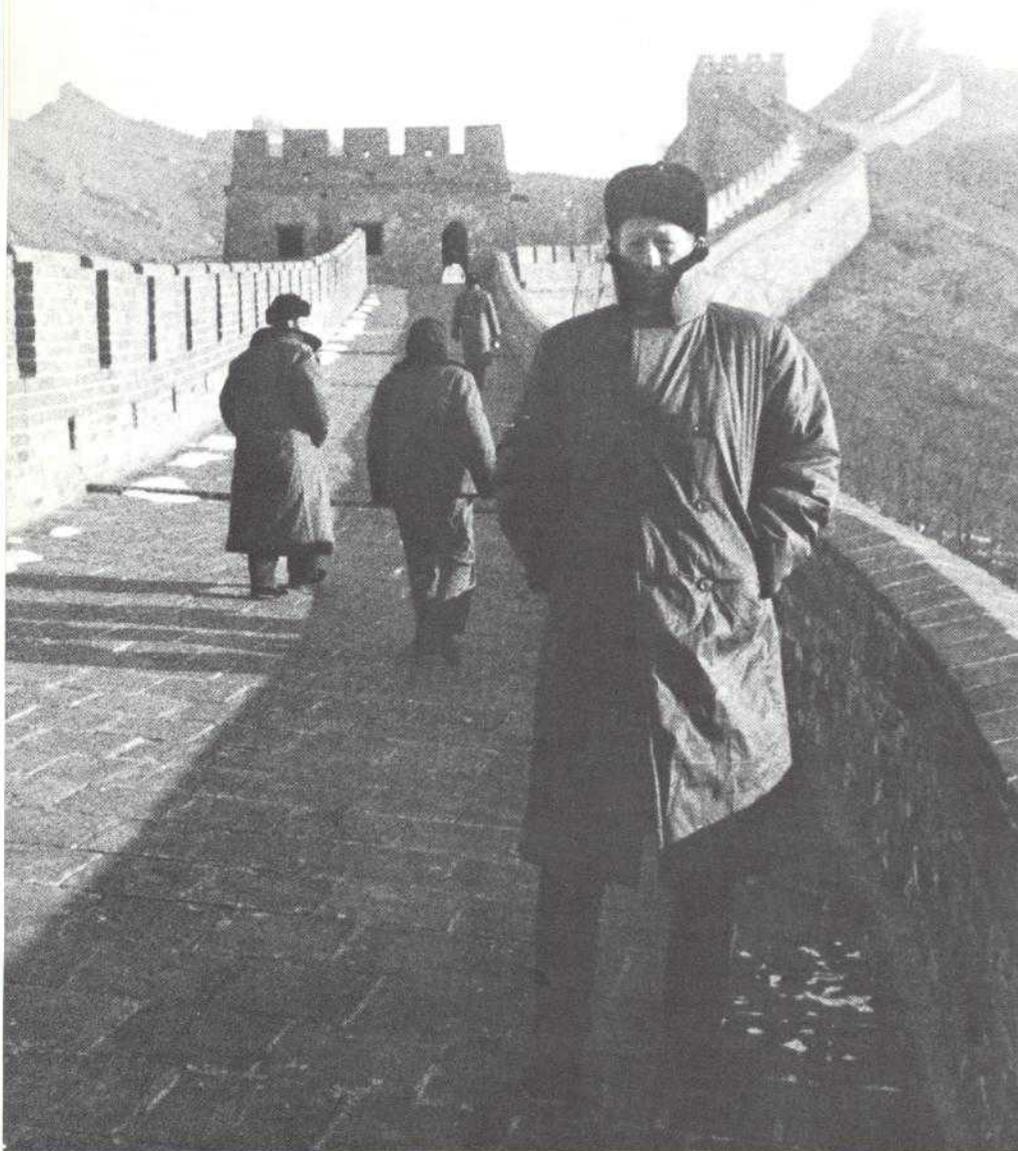
The President's trip to China may be the biggest television event since astronauts first stepped onto the moon (Apollo 11) in July 1969. Americans and Chinese are cooperating in extensive TV arrangements so that much of Mr. Nixon's activities while in Peking may be televised live via satellite to the United States and the world.

In addition, press dispatches and wire service photos will be beamed to this country via satellite.

The press party, not including the communications specialists who departed on February 1, will number about 80. President Nixon's press secretary, Ron Zeigler, said this will be only a quarter of the newsmen, photographers and technicians who normally accompany the President on international journeys.

However, he said, "We are pleased with the number." He added that 80 is far more than the Chinese had in mind earlier and would be at least seven times as many as have ever gone to Peking with other heads of state.

Gen. Sampson walks on the Great Wall during his recent visit to China.





Gen. Sampson, a member of the White House advance party, stands with Premier Chou En-lai in the Great Hall of the People during discussions for the Nixon visit.

Third IV launched for Pacific station

The third satellite in the INTEL-SAT IV series was successfully launched on Saturday, January 22, for an intended station over the Pacific Ocean.

Two days later the apogee motor was fired at the fifth apogee to thrust the satellite into near-synchronous orbit. COMSAT chose to fire the motor at the fifth apogee rather than the third in order to achieve an orbital position nearer the satellite's intended station before final orbital refinements are attempted.

Preliminary checkouts indicated that the satellite subsystems, including communications equipment, is functioning satisfactorily.

The satellite will be ready for commercial service in time to handle the large news flow out the Peoples Republic of China when President Nixon arrives there on February 21. However, the present full-time Pacific satellite of the INTEL-SAT III series may handle the Japanese Olympics traffic earlier in February.

When the new satellite is on station over the Pacific and fully checked out, the second satellite in the IV series

will be drifted to its Atlantic station where it will join the first IV in Atlantic region service.

The second satellite, launched successfully on December 19, was held in synchronous orbit over the eastern Pacific pending the results of the third launch. Had the third launch mission failed, the second satellite would have been positioned over the Pacific.

Additional Series IV launches are planned for 1972 and beyond to achieve five IVs in orbit initially—two over the Atlantic, two over the Pacific and one over the Indian Ocean.

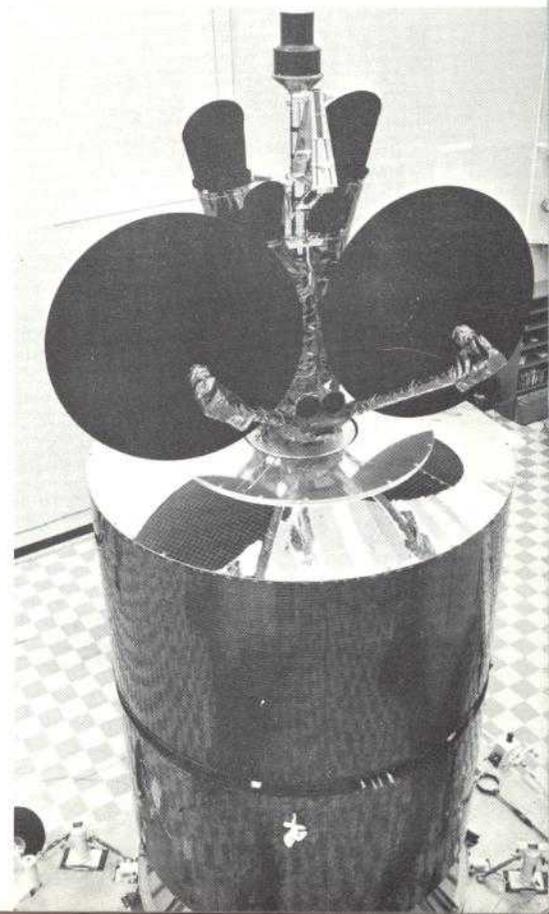
Each INTEL-SAT IV is capable of handling a varying number of telephone circuits simultaneously, depending on whether the power is radiated to earth by wide or spotbeam antenna configuration. The average antenna configuration provides telephone capacity of 5,000 to 6,000 circuits. Each IV can carry 12 color television channels or a combination of telephone, TV data and other forms of communications traffic.

NASA launches the satellites for COMSAT, on behalf of INTEL-SAT,

The third INTEL-SAT IV before launch.

the 82-nation consortium which owns the satellites of the global system.

The INTEL-SAT IV satellites are built by the Hughes Aircraft Company as prime contractor and with international participation. The satellites are launched by Atlas-Centaur vehicles built by the Convair Aerospace Division of General Dynamics.



The long wait

BY LARRY G. HASTINGS

"Genius is nothing but a great aptitude for patience."

Georges Louis DeBuffon
1707-1788

"If we don't launch soon, it will begin to take root," quipped a launch vehicle technician about the AC-26.

"AC-26"—for Atlas-Centaur number 26—had been standing on pad A of launch Complex 36 for months. The original launch date had been planned as early as July, but AC-26, with its 13.5 million dollar INTEL-SAT communications satellite, had remained earth-bound through no fault of its own.

On May 8, 1971, an identical Atlas Centaur, carrying NASA's Mariner 8 spacecraft had lifted off from Cape Kennedy on a planned flight to Mars. Shortly after launch, the rocket went out of control due to an autopilot failure in the Centaur stage and the Mariner spacecraft plunged into the Atlantic. In spite of that failure, a second Mariner spacecraft (No. 9) had to be launched on May 30, 1971 since the Earth and Mars would not be in celestial position again to permit another Mars mission to be flown for two years. Mariner 9 was a success, and subsequently televised exciting scientific data back to Earth.

But that success did not erase the nagging uncertainty. Lengthy failure investigations were held. Paralleling the hearings and failure review board meetings, the INTEL-SAT AC-26 was being erected on pad 36A. On June 15, the Atlas stage was placed on the pad and on June 28, the Centaur stage was mated to it.

The probing of the Mariner 8 failure continued. Engineers and technicians from both NASA and the rocket's builder, General Dynamics, felt that they had enough data and telemetry input to redesign a key component in the Centaur autopilot which would insure, as far as is pos-

sible in any launch, a successful flight for AC-26. All that remained to be done was to build, test and qualify as flight-ready the new component. Easier said than done.

COMSAT, Hughes and NASA engineers began to set tentative launch dates in anticipation of receiving the redesigned component. September 1 was targeted, but before the month of August was over September 17 became the new launch date.

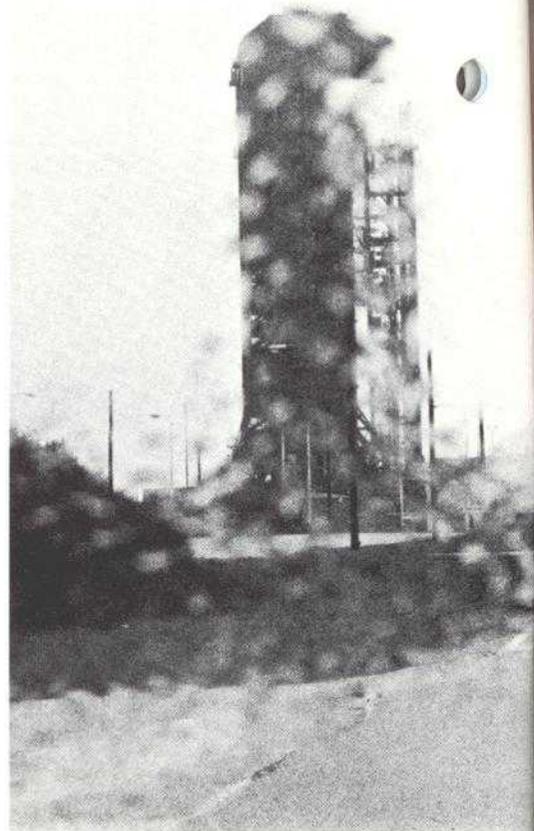
On pad 36B, AC-28 was being erected. On September 8, the Atlas and Centaur stages were mated. In the meantime, difficulty in successfully testing the critical component for the autopilot had again slipped the tentative launch date. This time, it was October 14, but that date, too, was to fall away with the month.

Despite all the painstaking methodicalness of launch preparations, uncertainty remains a harsh and troubling reality. Here is one experienced observer's view of how even the best-laid plans can be upset by the unpredictable.

Another date—December 6—was entered. This date began to look good, for the flight hardware for the autopilot in the Centaur stage successfully finished testing on November 22. With this crucial step past, the new date took on a substantial meaning. As December approached, more COMSAT personnel arrived at the Cape to keep pace with the accelerating schedule.

On December 3, the fine Florida weather collapsed in a blowing rain-storm that dropped two inches of rain on the Cape. Severe weather warnings were issued by the Weather Bureau and work out on the launch complex slowed to a soggy standstill. Saturday, December 4, was to bring a let-up. The wind subsided and the torrents of rain gave way to fog and drizzle.

The Air Force had scheduled the launch of an Atlas Agena with a secret surveillance satellite on board for that Saturday. Although secret



Pad B at Complex 36 as seen through a rainy windshield.

and unannounced in advance by the USAF, the word got around as it always does at the Cape and nearby Cocoa Beach. About dinnertime on the 4th, the Air Force's Atlas could be heard thundering off in the clouds and fog. In response to press queries, the AF confirmed that it had launched an Atlas on a "classified" mission.

Hours later, the word began to pipeline around Cocoa Beach that the Air Force had to "blow it"—destroy the rocket—when it began to veer off course early in the flight. Under pressure from the news wire services, it was admitted the next morning that the bird had been destroyed.

"What impact will this have on the INTEL-SAT launch?", the wire services asked COMSAT. The answer was not readily available since telemetry data had not yet been analyzed. Was the failure in the Agena stage? If so, the possibility of a similar problem in the AC-26 was not likely since AC-26 utilized a Centaur, not an Agena, upper stage. But, if the Atlas stage had failed, the outlook could be threatening. Quick-look data indi-

Mr. Hastings is a COMSAT senior information officer.

cated that the Atlas had suffered a malfunction, but what caused it?

The December 6 INTELSAT launch date was scrubbed pending the outcome of a complete review of telemetry data from the aborted Air Force mission. "INTELSAT IV launch re-scheduled for later this month" reported the local newspapers. Engineers flew to the West Coast to review data. Key COMSAT personnel flew to Washington for meetings. The press flew into a rage over a lack of information about the Air Force mission failure.

... the meeting had an almost clinical approach. The deceased was autopsied and each specialist reported his findings. The condition of the living patient was carefully reviewed...

Due to the short flight period of the Atlas-Agena prior to its destruction, telemetry and flight data were not conclusive. Enough clues were extracted to indicate the area of failure but were not adequate to isolate the cause. "Failure modes" were simulated in computer tests and analyzed. At the same time, COMSAT, NASA and General Dynamics engineers reviewed all pre-flight test data from AC-26, looking for the slightest anomaly which might even suggest the possibility of failure. None was detected. In the meantime, USAF helicopters kept searching the beaches at the Cape and Cocoa Beach for wreckage from the rocket which might provide valuable clues to the cause of the failure.

Through a combination of logic, telemetry data and as a result of exhaustive computer failure simulations over a period of twelve days, a decision was made to propose the installation of a device in a critical area of the vehicle's propulsion system which would indicate the possibility of a failure during the first seconds of the Atlas engines "burn" as thrust is building up for lift-off. The sensing device would make a split-second decision on a "go or no go" status. The engines would immediately and

automatically shut down in a "no-go" condition, thus saving the mission.

A flight re-scheduling meeting was to be held Friday, December 17 at 6 p.m. in the Unmanned Launch Operations Auditorium at the Cape.

Seated around a big conference table were representatives from NASA, the Air Force, General Dynamics, Rocketdyne and COMSAT. In the audience seating area were about 40 additional persons, including specialists who were called upon frequently to support one finding or another.

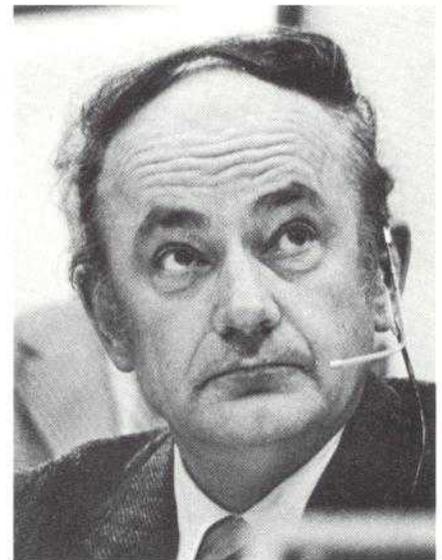
Officially called the "General Dynamics Update of the 5503 Failure Analysis," the meeting had an almost clinical approach. The deceased (the USAF aborted Atlas) was autopsied and each specialist reported his findings. The condition of the living patient—AC-26—was carefully reviewed: blood pressure, electrocardiogram and general health record.

Six hours and 10 minutes after it



Larry G. Hastings, senior information officer, during countdown.

began, the meeting ended. The six principals at the conference table adjourned to a private room to review the proceedings and to make a decision as to whether or not to re-schedule the launch attempt. Forty minutes later, the decision to go for a launch had been made. Since the AC-26 had been held in an "F minus one day" configuration, the launch



COMSAT President Joseph V. Charyk watches as the countdown approaches T—Zero.

could be attempted at 7:01 p.m. EST, the next night.

Saturday, December 18 dawned as a windy day. The count picked up at 9:40 a.m. Again, the Florida weather was beginning to degrade as a cold front from Canada plunged down across the U.S. towards the Southeast. Winds were gusty and remained unacceptable for launch throughout the day but the count continued with the hope that winds would subside at dusk.

At 4:05 p.m., the gantry began its roll-back from around the rocket. After being moved back 10 feet from the rocket, wind gusts measuring up to 30 knots created a "no-go" situation. As a result, the tower was rolled back to its protective position around the launch vehicle and the count went into a "hold." Reports from the meteorologists and data from weather balloons sent aloft from the Cape indicated that there would be no let-up in time to make the launch windows. As a result, the decision to "scrub" the Saturday launch was announced, with another attempt planned for Sunday, December 19.

On Sunday, the winds were still blowing, averaging 16 to 17 knots with gusts to 20 knots. This was not ideal for launch, but at least the winds were within acceptable limits. Cape weather forecasters predicted that wind conditions would steadily im-



Dennis V. Neill, manager, spacecraft technical control (left), and William H. Brauer, manager, control center branch, scan the console as lift-off approaches.

prove, and that prognostication proved correct.

Again, the count was picked up at 9:40 a.m. The weather continued to improve, and this time the gantry was rolled away from the rocket as scheduled.

The count proceeded well. The status board in the Mission Director Center was flashing green as each step was accomplished, with one exception: a range support radar panel on the board was showing red, indicating that it was not in service. This proved to be temporary and the count continued.

At about T minus 2 minutes and 15 seconds, step three flight pressure began to build in the LOX (liquid oxygen) tanks. At T minus one minute and 20 seconds, one of the voices on the "loop" feeding verbal data to the Mission Director Center called out, "Red line, LOX tank pressure!" This called for a re-cycle of the count to T minus 5 minutes to enable the

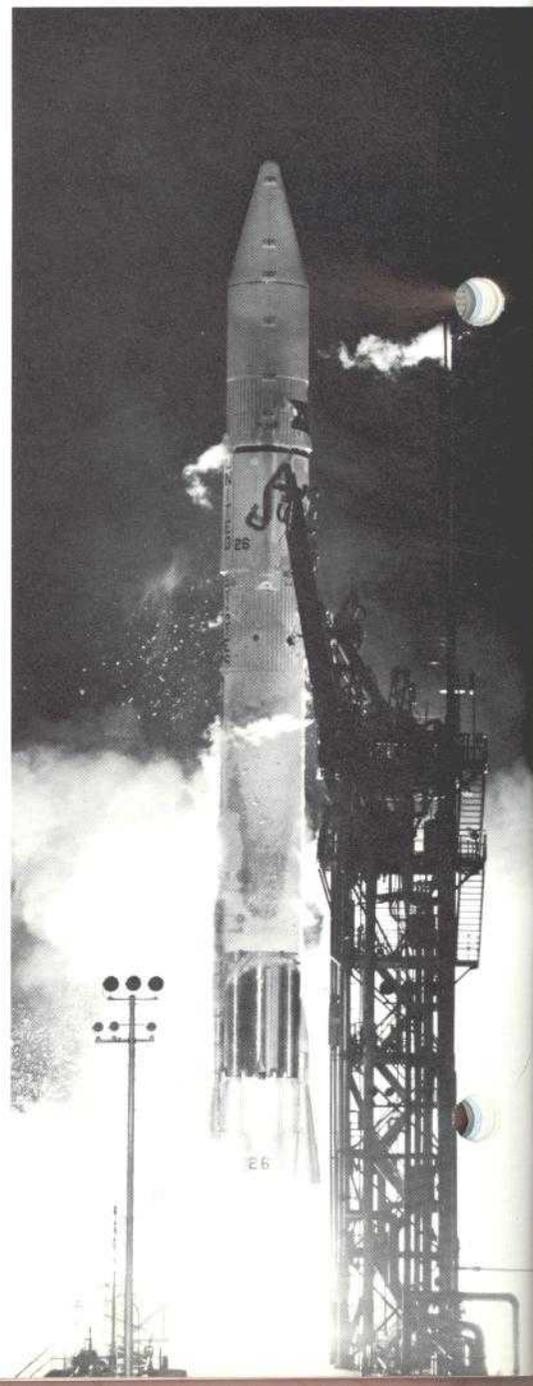
launch director to review the problem. The strip chart recorder print-out indicated LOX pressure slightly over the red line or limit. LOX pressure as shown on the panel meter and by telemetry readout was acceptable, so in view of these indications, it was assumed that the strip chart recorder had merely drifted out of calibration. The countdown was picked up again at T minus 5 minutes and proceeded to T minus 30 seconds when both the strip chart recorder and the panel meter indicated a high reading, causing another hold and recycle to T minus 5 minutes. Telemetry still read steady and verified a safe condition. The decision was made to use only telemetry for this pressure redline.

The count resumed at 8:05 p.m. EST and this time it went all the way—lift-off at 8:10 p.m. at the beginning of the second launch window. (The 25 minutes available in the first launch window were used up in the unplanned holds due to the indicated

LOX pressure problems and the three subsequent recycles.)

AC-26 lifted off from pad 36A with the characteristic thunder of an Atlas and the brilliance of a rapidly ascending sun. The weather was not only good, it was great: temperature 70 degrees, visibility 10 miles, surface winds down to 8 knots. As the Atlas Centaur roared through the few scattered clouds over the Cape, it was clear that its more than six months wait on the pad had not produced any unusual appendages for in the glare it was obvious that there were no roots on AC-26.

AC-26 lifts off at 8:10 p.m. EST on December 19, 1971.



Earth stations bring contrast to ancient sites

By GERALD H. BIDLACK

The earth station at Fucino, Italy, stands on the bed of an ancient lake.

The lake (*Lacus Fucinus*, in Latin), about 60 miles east of Rome, had no natural outlet and rose and fell considerably with the seasons. Many square miles of potential farmland were thus periodically inundated and made useless.

... among the many earth stations in the global system are some at sites with rich historical associations, which are reviewed in this account.

Julius Caesar was the first to make serious plans to drain the lake and reclaim the land. In the first century, the Roman emperor Claudius (stepfather of Nero) employed 30,000 men for eleven years to dig a three-and-a-half mile tunnel through the surrounding mountains, but with only partial success. The ruins of that tunnel are still there.

The later emperors Trajan and Hadrian tried to repair and improve on Claudius' project, but still the drainage was not complete. In 1240 a new beginning was made, but the work was not finished and the land made arable until the mid-19th century.

The Pleumeur-Bodou earth station is set in one of the most picturesque areas of France.

Only a few miles inland from the coast of Brittany, the earth station was built as the twin of the U.S. station at Andover, Maine, and participated in the first experimental transatlantic television relay in 1962.

The Celtic or Gaelic language and customs survive strongly in Brittany,

Mr. Bidlack is a COMSAT information officer.

which derives its name from the Celtic people (Britons) who fled across the English Channel when the Anglo-Saxon tribes began to invade England in the fifth century A.D. Other Celtic people retreated to Scotland, Ireland, and Wales. The Welsh language today is especially closely related to Breton French. The word "Pleumeur" is typical Gaelic Breton, meaning *big parish*.

The nearby beach resort of Perros-Guirec is on the Pink Granite Coast, a unique area of huge and small reddish boulders worn into fantastic shapes by the sea.

The area around Pleumeur-Bodou is dotted with megaliths erected by a prehistoric people as part of their now-forgotten religion. About 3,000 B.C. and long before the Druids, these Iron-Age men laboriously dragged the big boulders from elsewhere, tipped them into previously prepared holes, and stood them upright while the earth was filled in around them. Single rocks of this kind are called "menhirs," from a Breton word meaning *long stone*.

A second type of megalithic structure found throughout Brittany and around Pleumeur-Bodou is called a "dolmen." This is a burial chamber made of giant rocks. Originally they were covered with mounds of smaller stones and earth, but today many of the mounds have eroded or been stripped away, exposing the basic rock structure. One of these dolmens is used by an imaginative Breton farmer as a cow shed.

Darius is celebrated in ancient carvings near Asadabad.

The Iranian earth station at Asadabad stands near the ancient highway from Babylon to Ecbatana, the capital of the Medes and Persians.

The modern city of Hamadan, built on the ruins of Ecbatana, is 20 miles east of Asadabad in the heart of the Zagros Mountains. Ecbatana was the traditional capital of the Medes, and after the destruction of Nineveh in 612 B.C. it became the center of a major empire in the Middle East.

Under Darius, the Persian Empire became the largest the world had yet



Asadabad

seen. To celebrate his accomplishments, Darius ordered the carving of a huge relief on the face of a 2,000-foot cliff along the main road from Babylon at a place called Behistun. Still visible and in amazingly good condition after 2,500 years, the panel, in three languages, measures 100 by 150 feet and begins 300 feet above the ground. Behistun is about 50 miles southwest of Asadabad.

Darius began the construction of a new imperial capital in the south at Persepolis, but Ecbatana, high in the cool mountains, remained the summer royal residence.

Ecbatana appears frequently in historical records. The city is mentioned in the Old Testament book of Ezra as well as in several books of the Apocrypha. In 644 A.D. it was conquered by the Arabs. It was destroyed by Mongol invaders in 1220 and later rebuilt. In 1386 the Turkic emperor Tamerlane again destroyed the city; once again it was rebuilt. Hamadan is also the legendary burial place of the Biblical Queen Esther and her kinsman Mordecai.

Asadabad is nearly 200 miles west-southwest of Tehran, the modern capital. *Asad* is a common Iranian name; *abad* means a settled place in Farsi. *Georgetown* would be a good analogy in English.

Near the earth station at Emek Haela, Israel, is the very spot where David slew Goliath.

The Biblical story (I Samuel xvii) tells how David, the youngest son of Jesse and keeper of his father's sheep, accepted the challenge of Goliath, the nine-foot Philistine giant, to single combat. David felled the Philistine with a stone from his sling and then cut off the giant's head with his own huge sword. The Philistine army fled in panic.

Emek Haela is the valley where David slew Goliath.

The traditional spot where the encounter took place lies 16 miles southwest of Jerusalem and 14 miles west of Bethlehem near the Ha Ela (Hela), an intermittent stream which flows westward into the Mediterranean. *Emek* means valley or plain.

The neighborhood of Thermopylae, site of the Greek earth station, was an important military strongpoint in the ancient world.

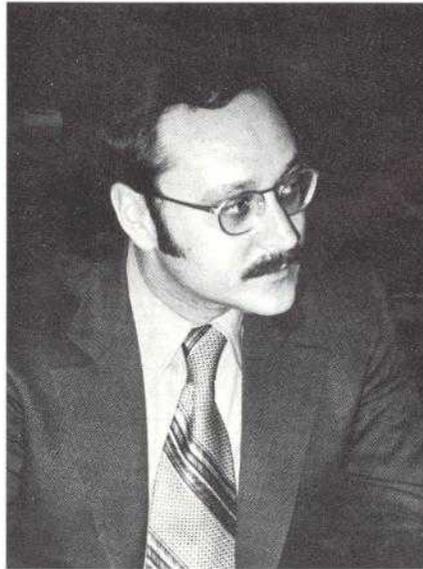
Thermopylae is on the east coast of Greece about 90 miles northwest of Athens. *Thermo* means hot, from the hot springs in the vicinity; *pylae* means gates, from the fact that the narrow four-mile-long pass through the mountains was the only land route along the coast. Now nearly a mile from the sea, the cliffs of Thermopylae at that time towered directly above the breakers. The only alternative route was far inland, where an invading army would be out of contact with its supporting navy and supply ships.

Thermopylae, where Leonidas and his Spartan heroes gave their lives.

In 480 B.C. the Greek city-states joined in a temporary confederation led by Leonidas, king of Sparta, to fight off an invasion by a huge Persian army and fleet under Xerxes. Leonidas and his troops made a stand at Thermopylae and held the Persians at bay for three days. A Greek traitor led the elite Persian infantry over the mountain tops to attack the outnumbered Greeks from behind. Realizing

he could not hold out, Leonidas sent the bulk of his army south to safety and boldly attacked the Persians, inflicting heavy casualties and delaying their advance.

Leonidas and all his Spartan corps were killed. The Persians faltered from a combination of spirited resistance at Thermopylae, approaching winter, and depredations by the Athenian fleet; eventually the Persian army withdrew to the north and Xerxes returned to Asia.



Mr. Goldstein

Goldstein named European director

Irving Goldstein has been appointed as Director, European Office, succeeding Sydney L. W. Mellen, who will retire on March 1, 1972.

Mr. Goldstein joined COMSAT in May 1966 and is presently a general attorney in the regulatory division of the General Counsel's Office. He is a member of the New York and District of Columbia bars and has been admitted to practice before the Supreme Court.

A native of Catskill, New York, Goldstein graduated from Queens College and the New York University School of Law. He is married and the father of two daughters.

Prior to joining COMSAT, he served as attorney on the staff of the International and Satellite Communications Division of the FCC.

Highlights of ICSC actions at 56th meeting

The Interim Communications Satellite Committee, governing body of INTELSAT, held its 56th meeting in Washington, D.C. from December 8 to December 15. All 18 members, representing 48 of the 82 signatories, were present at the meeting.

Among its actions, the Committee:

- Authorized COMSAT as Manager to amend the INTELSAT IV contract with Hughes Aircraft Company to provide for a study program of a derivative extended capacity INTELSAT IV satellite as defined by the ICSC/T at a price not to exceed \$500,000.

- Requested the Manager to study a Lockheed proposal for an "early version" INTELSAT V satellite (1975/76 operation) and submit its evaluation to the ICSC/T before its next meeting. Also instructed COMSAT to request proposals for a study contract which would provide the necessary "state of the art" and other critical information for an "early version" INTELSAT V satellite.

- Endorsed continuation of preliminary discussions between COMSAT and the European Space Research Organization (ESRO) on feasibility of collaboration on an experimental satellite program.

- Adopted an annual charge of \$13,000 per unit of satellite utilization for full-time use beginning January 1, 1972. The Committee also adopted charges for occasional use of the space segment for other than TV transmissions.

- Approved \$5,127,000 in new authorizations for INTELSAT research and development in 1972 with efforts representing \$2,597,000 of this total to be conducted by COMSAT as Manager at its Laboratories, and with efforts representing \$2,530,000 to be performed by outside contractors.

- Authorized the positioning of the second INTELSAT IV satellite (launched December 19) over the Pacific Ocean in the event the third INTELSAT IV satellite is not

launched successfully prior to the February meeting of the Committee. The Committee also authorized COMSAT as Manager to locate the INTELSAT III, F-2 satellite in the Pacific Region at 179 degrees east longitude as an emergency replacement for the INTELSAT III satellite presently operating in that area.

- Approved a proposed agreement with the French and German administrations dealing with locations of INTELSAT IV and Symphonie satellites between 20° west and 5° west

The Interim Communications Satellite Committee, or ICSC, the governing body of INTELSAT, meets periodically to conduct its business. Herewith is a review of actions at the 56th meeting.

in the geostationary orbit and providing that the longitudinal positions of the INTELSAT IV satellites in the Atlantic area, to the maximum extent possible, will not extend further east than 18 degrees west longitude, and the Symphonie satellites will not extend further west than 12 degrees west longitude.

This agreement resolved a conflict over orbital position which was in question because both INTELSAT and Symphonie had previously announced plans to locate satellites at 15° west. In approving this agreement the U.S. placed on record its reservation that endorsement of this agreement did not prejudice the resolution of other matters that might arise with respect to the Symphonie program.

- Taking into account the understanding reached with respect to the INTELSAT and Symphonie satellite locations, operational satellite spacing requirements (at least 5 degrees apart), and the announcement that Mexico intends to construct a second Atlantic antenna, the Committee agreed to deploy the Atlantic major path satellite at a nominal position of 29.5 degrees west longitude with the primary and spare Atlantic region satellites at 24.5 degrees west.

- Expanded its preliminary decision taken at the 55th meeting to establish guidelines for the long term allotment of a television channel. In particular, it adopted a minimum period of one year for full-time TV allotments, with longer periods to be made available on a "best efforts" basis. The Committee also established a charge for cancellation of a reservation of a full-time TV channel equal to three months space segment charges for the reserved capacity, payable in the event that notice of cancellation is given less than three months prior to the scheduled date of service.

- Approved continuation on a commercial basis of the National Science Foundation project in which the Committee in January 1971 approved experimental access of a small diameter unmanned earth station located in the Antarctic near McMurdo Sound to collect scientific data and relay it to the United States via a Pacific INTELSAT satellite.

- Approved access of a COMSAT nonstandard earth station, now at the Plaza, to operate with a spot beam transponder in the Pacific INTELSAT IV satellite for demonstrations in the State of Alaska which will show the feasibility of reception of TV (one video channel with an audio sub-carrier) and two-way voice communications (one two-way circuit) in local climatic conditions.

- Delegated authority to COMSAT as Manager to grant, if requested, access by a nonstandard earth station to the Pacific INTELSAT III or IV satellites during the period February 15 through March 3.

- In addition to approval for a number of new standard earth stations to access INTELSAT satellites, the Committee approved for continued access to the space segment, solely for test and demonstration purposes, the COMSAT-owned nonstandard earth station at Norwood, Massachusetts.

- Authorized COMSAT to enter into a contract with RCA Limited of Canada for a multiple beam antenna isolation study. This contract will include certain significant deviations from the INTELSAT standard contractual terms and conditions which,

when combined with a Committee review of existing patent and data policy, could result in significant changes in that policy.

- Reviewed the activities of each of the three advisory subcommittees and decided to continue them under their present terms of reference. The Committee also reappointed for one year the present officers: Advisory Subcommittee on Finance, Messrs. Nash and Caruso; Advisory Subcommittee on Technical Matters, Messrs. Dietrich and Houssin; Advisory Subcommittee on Contracting Procedures, Messrs. Steiner and Fiorio.

- Approved a one-year term on the Manager's staff of Mr. Philippe Feve, a nominee of the French Signatory, and a one-year extension of the term on the Manager's staff of Mr. Toshio Satoh, a nominee of the Japanese signatory.

- Scheduled the 57th meeting of the Committee to begin in Washington, D.C., on February 23.

Antenna count: 63

Twelve new earth station antennas began operations during 1971, the second largest one-year increase in earth station facilities since the start of commercial satellite service.

The peak of earth station development to date was in 1969, the same year that the INTELSAT system became truly global in scope with the emplacement of an INTELSAT III satellite over the Indian Ocean. That year 20 new earth station antennas, at 17 different station sites, operated by 11 different countries, went into service.

Last year 12 new antennas, at nine sites, operated by nine different countries, began operations. Of the 12 new station antennas added to the system in 1971, six were in the Atlantic region, two in the Pacific and four in the Indian Ocean region, according to data maintained by the Traffic Department of Operations.

The boxscore for the global system, cumulative since the Early Bird era in 1965, now shows: 63 earth station antennas at 52 earth station sites owned by 39 different countries.

The interface between the computer and its users

The Management Applications Department is the link between COMSAT's computer and those corporate elements who use it as a working tool for information retrieval and processing.

In its role, this team of specialists furnishes the capability for daily implementation and maintenance of the computerized management information and data processing systems.

PHOTOS BY J. T. MCKENNA



Pete Reynard, staff member, checks a program in the operations center.



Nathan Tonelson, manager, points to Costa Rica, new member of INTELSAT as he discusses a computer run with Mary Lane, secretary.



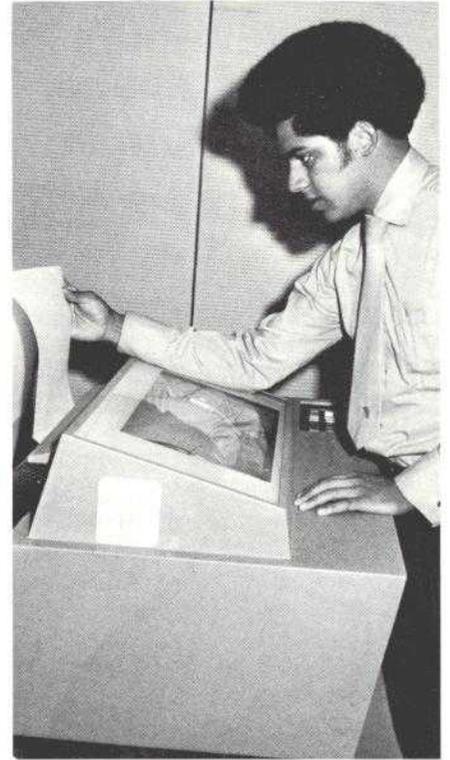
Staff members John DeCaro and Joyce Morton modify the personnel information system.



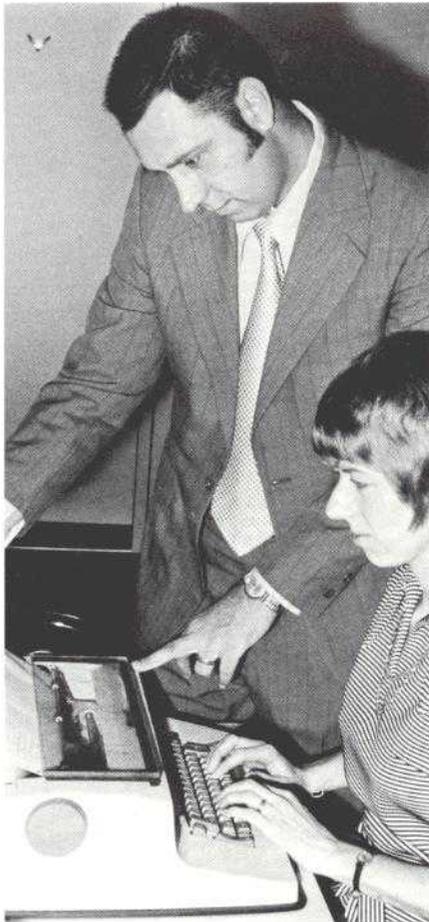
Ethel Saltz, staff member, as she returns from the computer room.



Ken Morimoto, staff member, updates an information retrieval system.



Staff member Bob George watches the best run of all—payroll.



Al Yenyo, manager, implementation branch, reviews an inventory system with staff member Kate Donvito.



Jim Hall and Helen Baxter, staff members, review flow charts.

The expanding volume of global TV via satellite

By DANIEL D. KARASIK

Television via satellite, once considered a luxury to be used on extraordinary occasions by the broadcasting industry, has become a necessity. Use of satellite television has multiplied 25 times in the short period of five years.

Global satellite TV increased in 1971 by almost a half. U. S. (or COMSAT) volume showed a small gain in the face of economic setbacks suffered by the TV networks.

The growth thus far of COMSAT TV volume was greatest in the 1967-69 period when the global capability was being established. The volume in 1967 was triple that in 1966, and it approximately doubled again in 1968 and in 1969. During this era, regular use of satellite television for news, sports, and public affairs became well established.

Despite 1971's partially unfavorable economic conditions for them, including a loss of cigarette advertising revenues, U.S. television networks continued to order satellite TV at a high level. The U.S. networks and European broadcasters continued to use satellite transmissions of news programming almost daily.

The potential market for satellite TV tends to be limited by the existing number of television programs that use such programming. Most news and public affairs programs of U.S. TV networks now use, on a regular basis, material transmitted via satellite. Barring unforeseen international events with enormous interest and given present U.S. network programming requirements, U.S. requirements for satellite TV may be approaching a temporary plateau. Thus, the next major upswing in COMSAT TV volume may depend on major new programming requirements other than in news and sports.

Mr. Karasik is COMSAT manager for television development.

In the not distant future we can look toward increased use of satellites as a mode for distributing, on a regular basis, prepared materials such as syndicated newsfilm and program features.

It is also to be expected that the growing use of closed circuit television for theatrical and sports events, as well as for conferences introducing new products, marketing campaigns and training, will make up a significant part of satellite television traffic in the future.

As might be expected, volume fluctuates according to the frequency and magnitude of important news events around the world. Such events, as judged by the broadcasters in the context of the day's news and their own budgetary and programming requirements, directly affect the volume of satellite TV.

The well-established acceptance of satellite TV by broadcasters here and abroad suggests that it has become a "necessity" in their programming requirements.

Generally, 1971 did not produce quite the number of significant events with strong international interest that 1970 produced. It is expected, however, that 1972 will bring an increase in COMSAT and global volume because of the forthcoming political conventions and Presidential election, the Olympic Games in Munich, Germany, and Sapporo, Japan, and President Nixon's scheduled visits to China and the Soviet Union.

Although global TV volume is also largely determined by international news and sports events, other factors were present in 1971 to contribute to the large increase in INTELSAT traffic. These factors included an increasing use of multideestination TV transmissions, which offer receiving nations strong inducements since the broadcasters' cost of such receptions decreases as the number of recipients increases. Of the average 265 television transmissions per month via the satellite system in the second half

of 1971, about 37 were multideestination. About a third of total television half channel hours are due to multideestination telecasts.

The continuing proliferation of foreign earth stations also contributed to growth of TV transmissions by establishing capability to transmit news events from points that were previously out of reach and, of course, new demand to receive satellite TV is generated as each new station joins the system.

Of importance also was the extent to which Spain used satellite TV transmissions for news and cultural programming to its Canary Islands territory during 1971. This use amounted to almost 100 transmissions per month between earth stations on the Spanish Mainland and Grand Canary Island. The satellite system offers an inviting capability to use such intranational exchange to help maintain and strengthen political and cultural ties among people who are geographically separated.

Again during 1971 the special appeal of international TV transmissions among culturally-related nations was evident. A significant development in this respect was the establishment of the Ibero-american News Service early in the year. TV news exchanges were transmitted five days a week from Spain to several South American nations, and when events warranted from one or more South American nations to the other participants. In this way, the satellite system can serve directly the information

Satellite television can strengthen political and cultural ties among people who are geographically separated.

needs of international audiences with mutual interests.

Specific highlights of global satellite TV during the year included the Frazier-Ali heavyweight championship boxing match in March. It resulted in a record number of earth stations—26—participating (via four satellites) in a single telecast.

Another highlight of the year was the *Children of the World* program in

June, a technical accomplishment in that six TV channels were used in four satellites permitting two-way transmissions and rapid switching to different originating points. The hour-long program, marking the centennial of the International Telecommunication Union, was seen live in 45 countries. Live transmissions for the program originated in Geneva, Switzerland; Toronto, Canada; Tehran, Iran; Bogota, Colombia; Rio de Janeiro, Brazil; Atlanta, Georgia; Sidney, Australia; Tokyo, Japan; Orense, Spain; and the United Nations Headquarters in New York where Danny Kaye performed as master of ceremonies.

Live TV coverage of the 2500th anniversary celebration of the Persian Empire at Persepolis in October was seen in more than 50 nations.

Television via satellite is undoubtedly the most dramatic demonstration of the tremendous potential of satellite communications.

Other notable TV transmissions (COMSAT and global) of the year included:

Apollo 14 mission, the visit to the United States of Premier Colombo of Italy, the Los Angeles earthquake, the Caribbean baseball series, the Hawaiian Open Golf Tournament, the World Figure Skating Championships, the World Curling Match, the NCAA basketball championship game, the Libertadores Cup soccer match, the Papal Easter Mass and Blessings, a speech by President Nixon on Vietnam, the Academy Awards ceremony, Latin American soccer matches, the Emmy Awards ceremony, the Kentucky Derby, the Preakness, U.S. baseball, the All-Star Game and the World Series.

Also, the signing of the U.S.-Japanese Okinawa Agreement, the Belmont Stakes, bull fights from Spain, the Wimbledon Tennis matches, the Miss Universe contest, the Apollo 15 mission, Queen Juliana's visit to Indonesia, the Pan American Games, the Little League Baseball champion-

ship, rugby, soccer, Emperor Hirohito's foreign tour, the Latin American Song Festival, the visit of President Tito of Yugoslavia to the United States and Canada, the Papal Christmas Mass and U.S. professional and college football.

Satellite TV doesn't just happen; it requires much advance planning and expertise.

As the U.S. satellite communications common carrier, and as Manager of the space segment of the satellite system on behalf of INTELSAT, COMSAT continued during 1971 to develop plans and procedures to meet particular TV-user requirements. A specific example of the operational planning that can be necessary is found in the Apollo missions. During these missions, other satellite TV requirements must be met while, simultaneously, NASA's substantial TV requirement is met. Also, in order for broadcasters abroad to see live TV from the moon and from space COMSAT developed and coordinated a plan involving supplementary frequencies and equipment to provide additional television channels in the Atlantic and the Pacific satellites. Thereby, the special NASA signal can be relayed from overseas to NASA Mission Control in Houston where it is converted to a standard television signal and released to the broadcasters who in turn arrange for re-transmission via the same satellites to points around the world. A similar procedure is used to provide Pacific area broadcasters with real time coverage of splashdowns.

COMSAT also continues to look ahead to events such as the 1972 Olympics in Sapporo and Munich and the President's China trip to insure that adequate facilities and procedures will be available for satellite telecasts.

Although television accounts for only a small fraction (about 2 percent) of satellite system revenues, it has become a highly significant service and will remain so. Live transoceanic TV is clearly an unique service: no other communications mode provides it.

The satellite system helps satisfy broadcaster needs for international program material and appeals to viewers' undoubted interest in major foreign events. But satellite TV does more than satisfy such needs. When a person anywhere watches live TV coverage of a news event, and watches with an awareness that millions of people in many countries are watching the same scene at the same moment, his feeling of a globally-shared experience is intensified. In this sense, satellites intangibly amplify the program matter and heighten interest in it. Under such circumstances, an ordinary viewer recognizes that a new dimension has been added to the world's communications resources.

With a record of 6½ years of successful operation to its credit, and boosted by growing appreciation of its capabilities, the satellite system is expected to have greater TV volume during the coming year. Television via satellite is undoubtedly the most dramatic demonstration of the tremendous potential of satellite communications.

Superbowl via satellite seen far and wide

The global system carried the recent Superbowl football game live and in color to Alaska, Hawaii and Puerto Rico, as well as to many U.S. military personnel stationed abroad.

Three and a half hours of time was booked for the transmission of the game via the Atlantic INTELSAT IV satellite to Puerto Rico and armed forces TV networks in West Germany and Panama.

At the same time, the game in New Orleans between the Dallas Cowboys and Miami Dolphins was transmitted live via the Pacific INTELSAT III satellite to Alaska, Hawaii and armed forces TV networks in Korea and the Philippines.

The COMSAT-operated earth stations at Etam, West Virginia, and Jamesburg, California, transmitted the signals for relay by the satellites to their destinations.



Mrs. Audra O. Culver

Funeral service held for Mrs. Culver

A funeral service for Mrs. Audra O. Culver, administrative assistant in the office of the Vice President-International, was held on January 22 in Mayo United Memorial Methodist Church, Mayo, Maryland. Interment was in Hillcrest Gardens Cemetery, Annapolis.

She is survived by her father, Charles Oates, Sr., and brother, Charles Oates, Jr., both of West Virginia; her mother, Mrs. James McNight, of Ft. Lauderdale, Fla.; a sister, Mrs. Eldridge Jenkins, of Severna Park, Md.; her daughter, Mrs. Harry Shafer, of Olney, Md. and a grandson, Ronald Clifford Shafer.

Mrs. Culver was slain in the L'Enfant Plaza parking garage when leaving work at 10:30 p.m. on January 17. The 21-year-old L'Enfant Plaza security guard who escorted Mrs. Culver to her car was arrested and charged with murder.

"Mrs. Culver was a highly valued employee who was as conscientious, dedicated and capable as anyone

could want," said Richard R. Colino, Assistant Vice President-International. "Those of us who worked closely with her will remember her with affection and respect. We shall all miss her and we extend our deepest sympathy to her family."

Mrs. Culver joined COMSAT in March 1966. Previously, she had been administrative assistant to the Director of Operations and Subsidiary President, Airtronics, Inc.; administrative assistant to the President of Washington Technological Associates, Inc., and executive secretary to the Engineering Manager, Engineering Research Corporation.

Mrs. Culver was valedictorian of her class at Pennsboro, W. Va., High School in 1939, and also was a graduate of Mountain State College, Parkersburg, W. Va.

Safety procedures revised at Plaza

Following the death of Mrs. Audra O. Culver, COMSAT began a complete review of the safety arrangements at L'Enfant Plaza and instituted some new interim measures.

Dr. Joseph V. Charyk, COMSAT president, advised employees of the steps in the following memorandum:

"The tragedy that occurred in the L'Enfant Plaza garage has shocked and saddened all of us, and intensified our concern for the personal safety of our employees. Beginning immediately, a thorough review will be undertaken of all procedures and practices now in effect and new ones that might be instituted.

"Toward this end, Mr. Donald E. Greer and Mr. J. Robert Loftis are designated as a focal point for a complete study of the safety measures relative to our building. Full participation is invited in this study by all employees and your suggestions are earnestly solicited. We know that you share the concern of management in this important area.

"Pending a complete examination of physical security and the institution of the most secure procedures practicable, new temporary arrangements will be made.

"Effective immediately, no female

employee who is required to work overtime should enter the garage after 6:00 p.m. (unless in her judgment she is properly escorted). She should call the COMSAT transportation office where arrangements will be made for one of the COMSAT chauffeurs to deliver her car to the main Plaza entrance of the COMSAT Building.

"Arrangements for safe transportation can be made through the COMSAT transportation office for those females who do not drive cars to work.

"We in management will do everything in our power to limit the risk to which our employees are subjected and to contribute where possible to the safety of all of us. Your cooperation toward this end is solicited."

Battelle wins award

COMSAT on behalf of INTEL-SAT proposes to award a contract to Battelle Memorial Institute of Columbus, Ohio, for the selection, developing and testing of materials for use in the fabrication of a microwave filter, and the delivery of a prototype filter device. The \$39,600 contract is to be completed within ten months.

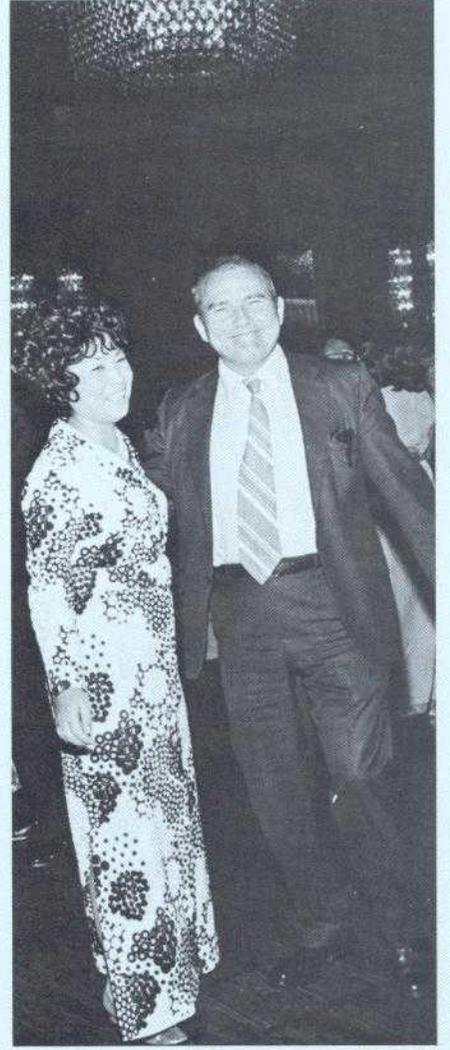
In the conduct of this study the contractor shall select and test a material or combination of materials and improve it as necessary to develop a fully suitable material having the desired characteristics for fabrication of a microwave filter. The contractor shall also develop the fabrication technology to produce a prototype microwave filter from the selected and adequately tested materials.

Wave tube models

COMSAT on behalf of INTEL-SAT proposes to award a contract to Thomson-CSF of Paris, France, for the design, development, fabrication, test and delivery of engineering models of an 11-GHz traveling wave tube amplifier for satellite applications. The \$200,000 contract is to be completed within 14 months.

The traveling wave tube is to employ a dispenser cathode and provide a single carrier saturated output power of 20 watts at an efficiency of at least 32 percent.

COMSAT EMPLOYEE NEWS



Dining and dancing

CEA's annual Christmas dinner-dance was held on December 18 in the Regency Room of the Shoreham Hotel.

Continuous music, cocktails and a delicious meal provided a delightful evening for the 360 persons who attended the holiday event.



COMSAT benefits provide hospital aid

By DONALD J. CHONTOS
AND WALTER J. KUTRIP

This is the sixth in a series of articles prepared by the Personnel Office to explain COMSAT's benefits program.

The last article began the discussion of the Corporation's medical insurance plan.

When you or your dependents require hospitalization, COMSAT's plan will pay the first \$1,500 per confinement of the semi-private room and board and cover special services charges. If intensive care is required, up to an additional \$1,000 is available to help meet these expenses.

Charges in excess of \$1,500 (or up to \$2,500 if intensive care is required) are reimbursable under major medical insurance without need to satisfy the deductible. Major medical insurance pays 80 percent of the covered excess charges and you pay 20 percent.

Benefits for private room and board charges will be limited to the highest semiprivate room rate normally charged by the hospital in which the patient is confined.

Benefits equal to "reasonable and customary" charges made by the hospital where confined will be paid for the following:

- (1) Services or supplies furnished for use during the hospital confinement, including charges for blood and blood plasma and the administration thereof to the extent the charges are not reduced by blood donations. It does not include charges for room and board, special nursing services, or the services of a physician except as indicated under (4) below.
- (2) Anesthetics and the administration thereof.
- (3) Use of local ambulance.
- (4) Treatment by a cardiologist or pathologist, provided he is a legally qualified physician and his services

Mr. Chontos is manager, employee benefits. Mr. Kutrip is manager, employee services.

are rendered at the discretion of the hospital.

A benefit will be paid for "reasonable and customary" charges incurred in connection with confinement in a hospital for intensive care. The plan allocates up to an additional \$1,000 for such charges. However, this benefit is limited to actual days during which intensive care is required. Should the hospital not itemize its intensive care charges, 60 percent of the hospital charges will be applied against the \$1,500 regular hospital benefit and the remaining 40 percent against the additional \$1,000 intensive care benefit.

If a patient no longer requires the extensive care of hospital confinement but needs attention not available at home, reduced benefits for recovery in an extended care facility are available, but only upon direct transfer from a hospital after at least three days confinement.

Successive periods of hospital confinement shall be considered as occurring during one continuous period of disability unless satisfactory evidence is received that:

- (1) The causes of the later period of hospital confinement are unrelated to the causes of the previous period of hospital confinement, or
- (2) The later period of hospital confinement commenced after complete recovery from the causes of the previous period of hospital confinement, or
- (3) In the case of an employee, the later period of hospital confinement commenced after he returned to work and completed at least one full day of active service.

You will also be reimbursed for all charges made by a hospital for services and supplies as a result of emergency outpatient treatment for non-occupational accidents, provided treatment is rendered on the day of accident or the next following day. Charges will be paid in full up to \$1,500.

All of the hospital expenses previously described are reimbursable provided that they are the direct result of a non-occupational injury, disease or illness and the individual becomes confined in a hospital while:

- (1) Insured under this coverage, or
- (2) Within three months after insurance under this coverage is discontinued.

In the latter case, the individual must be wholly disabled when his insurance is discontinued and become hospital confined during the continuance of that disability.

Charges resulting from treatment of occupational injuries, diseases, or illnesses are reimbursable under the applicable Workmen's Compensation Laws and regulations.

The next article in this series will continue the discussion of the Corporation's medical insurance plan.



Technician Victor Molek (left) receives his Christmas turkey from William Carroll, station manager (right) and Chester Randolph, administrator.

News from Etam

By DELORIS GOODWIN

The Etam COMSAT Employees Association held its annual adult Christmas party at "The Barn" near Oakland, Maryland, on December 10.

A Christmas party for the children of Etam employees took place December 18 in the training room at the station. Punch and cookies were served to those attending. At the conclusion of the party, Santa Claus appeared and presented each child with a gift and candy. Bill Surber, Headquarters Technical staff, who is now a semi-permanent employee at Etam, was instrumental in assuring that Santa arrived on time.

Mrs. Goodwin is accounting and personnel clerk at the Etam Earth Station.

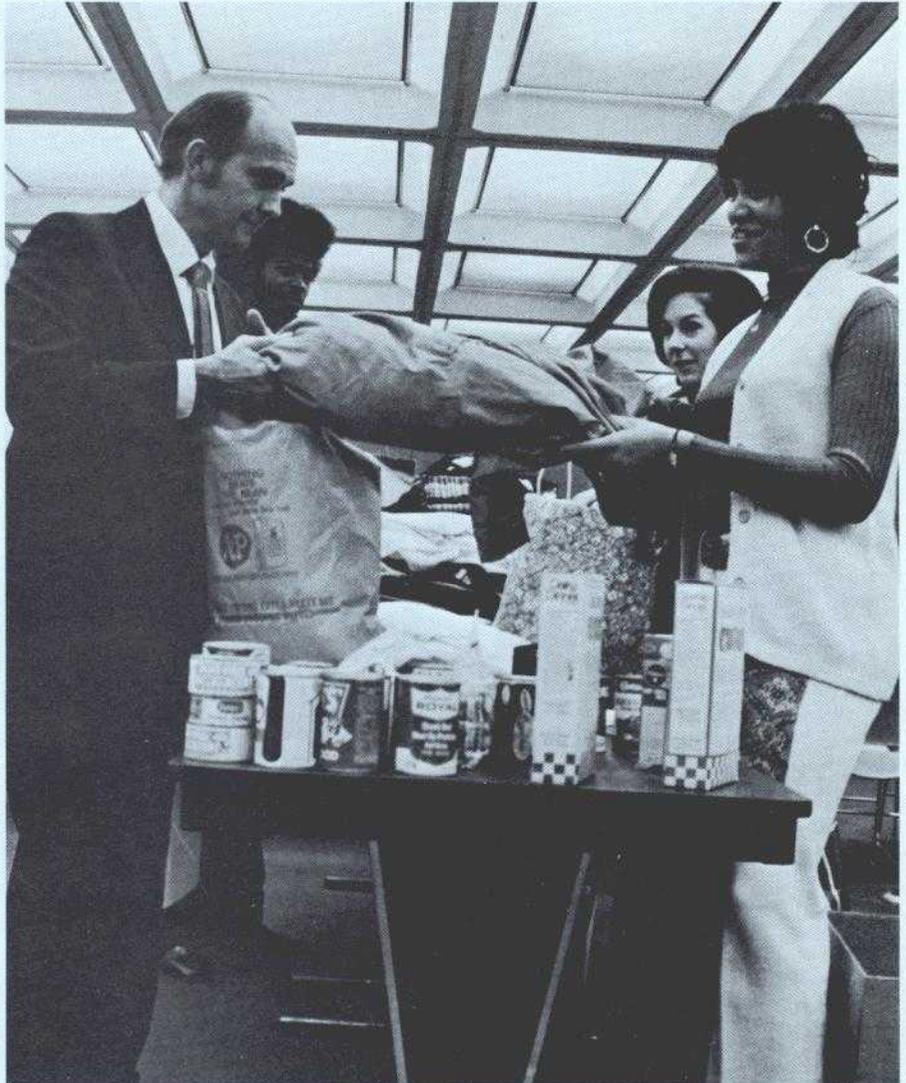
Jamesburg review

By M. LEE DORSEY

It was a busy year in 1971 at the Jamesburg Earth Station. Highlights were:

- Jamesburg shared the role of bringing communications through for Apollo 14 and Apollo 15. The TV coverage was excellent.
- Station personnel assisted in the rescue of Boy Scouts lost in Los Padres Forest.
- The Jamesburg Apollo Cachet was sent to stamp collectors worldwide. Some 900 envelopes were mailed.
- Cachagua Valley residents defeated a proposal to build a water reservoir dam in Cachagua Valley.
- AT&T started installation of a new alternate microwave route to Jamesburg due to be completed in 1972.
- Jamesburg donated surplus electronics equipment to Monterey Peninsula College.
- Jamesburg took part in tests for the unattended Antarctic Station.
- A representative of the Thailand Government visited Jamesburg.
- Jamesburg was selected as the test station for the Hughes antenna used in Iran for the Persian Empire 2500th Centennial celebration.
- Station Manager John P. Scroggs was installed as President of the Carmel Valley Kiwanis Club.
- The Blood Bank grew to 31 units in 1971.
- Safety: only one on-the-job accident for Jamesburg in 1971.
- Transfer: Cecil V. Jeter, Jr., operations supervisor, was promoted to Operations Center controller and transferred to COMSAT Headquarters.
- The Chairman of COMSAT's Board of Directors, Joseph H. McConnell, and the COMSAT President, Joseph V. Charyk, visited Jamesburg.
- New Employee: Peter Roberts joined COMSAT as utilityman.
- Promotions: A. Roy Scheiter, facilities mechanic, promoted to senior

Mrs. Dorsey is finance-personnel clerk at the Jamesburg Earth Station.



Christmas togetherness drive aids needy

Alice Bullie (front) and Bert Runfola, both of Finance and Administration, accept a clothing donation from Joseph Wellington (front), also of Finance and Administration, during the recent holiday drive to help Washington's needy families. William Alford, General Services, prepares to pack the donation.

More than 50 cartons of clothing, toys and food were delivered to the D.C. Department of Human Resources in time for the holidays.

facilities mechanic; Jimmy L. Clark, technician, promoted to senior technician; William M. Hartke, senior technician, promoted to operations supervisor.

• COMSAT-Jamesburg was honored by the Salinas Californian Newspaper in its 1971 Rodeo Progress Edition. The title of the edition was, "Saddles to Satellites."

• Our Christmas stocking this year held a turkey, the gift of COMSAT's President and Chairman.

5-year awards

The following personnel received five-year service awards during January:

Andover: Cornelius J. Merrill.

Finance and Administration: Regino M. Maceyras.

Laboratories: Thomas J. Celi.
Operations: Barbara M. Bracht and Robert J. Rodgers.

Paumalu: Robert M. Kumasaka.



Henry Williams shows his form on the ski slopes of Colorado.

People at the Labs

By BETTY MOWEN

It appears the holidays were enjoyed by all at COMSAT Labs. Many people celebrated by visiting with friends and relatives, while others entertained at home.

Henry Williams, antenna branch, spent his holidays skiing in Vail, Colorado. An expert skier, who enjoys competitive skiing, he won a gold medal at Vail for the standard races. Henry is a member of the Ski Club of Washington, D.C.

Judy Calvo, personnel, visited with her father in Fort Lauderdale, Florida, for the holidays.

Rich Trushel, scientific applications branch, flew home to St. Louis, Missouri, to spend Christmas vacation with his family and friends.

Mrs. Mowen is the COMSAT Labs nurse.

John Bowles, model shop, is recovering in Montgomery General Hospital from a broken leg.

Lee Terry, switching and multiplexing techniques branch, recently left on a one-year leave of absence for a Peace Corps assignment with his wife in Liberia, West Africa.

Darleen Jones, service center, is recuperating in Suburban Hospital, Bethesda, Maryland, following surgery.

Tom Celi, scientific applications, said goodbye to all his friends at a luncheon held in his honor at Michel's in Bethesda on Friday, January 14.

Charles Ray Byrum, service center, and his wife recently spent a week in Florida where they attended the Dolphins-Colts game.

Bill Fallon, administration, and wife, Phyllis, recently returned from a 10-day cruise of the Caribbean. They visited Puerto Rico, St. Thomas, Antigua, Martinique and flew home from Trinidad. What a way to start a new year!

The Plaza scene

By HARRIET BIDDLE

New Year's resolutions have been made and broken as people at the Plaza settle in for the winter months that finally arrived. It had been a mild, mild winter in Washington, with nary a snowflake to be seen and spring-like days in January.

June Burton, executive office, was thinking ahead last year when she took a course in conversational Spanish. Much to her amazement, it came in quite handy when she made a trip to Caracas, Venezuela, over the Christmas holidays. She was actually able to communicate slightly with waiters, cab drivers and such, but found herself running out of words before the conversations progressed very far.

Doris Babcock, Management Review and Coordination, has an interesting story to tell about her "blooming tomato plants." She cut off the tops of her plants after the first frost and brought them in to the office as proof that they were indeed blooming. A good natured argument ensued as to whether the plants would survive indoors. Sure enough, one did, and it produced a bright red, ripe tomato on January 6.

We have another bride-to-be in Legal. Meredith Forinash is planning to be married in February in York, Pennsylvania, to Henry von Kohorn, a real estate analyst. Meredith and Henry will make their home in Milwaukee, Wisconsin.

Lester Cameron, who works in the 6th floor service center by day, has a most interesting avocation by night. He manages and arranges music for three professional vocal groups. One group, the "Belaires," composed mostly of college students has been quite successful in this area and travels on weekends to cities all along the Eastern seaboard. Lester, who received his musical training at Howard University, also plays a number of musical instruments himself.

Miss Biddle is a secretary in Management Review and Coordination.



Bob Makizuru checks parts inventory.

In the shadow of the shelves, a key support service

BY ROBERT N. KUMASAKA

One of the more frequently overlooked and taken-for-granted employees at any earth station is the material control specialist. Because he works alone and often in the shadows of storage shelves, the presence of this valued team member is not always readily apparent. But without his knowledge and expertise in all phases of material control and handling, a key element in station support would be lacking.

At Paumalu, the position of material control specialist is filled by Robert H. Makizuru, a retired Army supply specialist. Under his control are supplies that represent a substantial investment by the Corporation. He keeps track of over 4000 line items of equipment ranging in value from 25-cent diodes and transistors to traveling wave tubes worth several thousands of dollars.

The three antennas and two standby generators at Paumalu, with their multiplicity of equipment, require stocking a larger inventory of spare parts than the standard single antenna station. Bob Makizuru has seen to it

Mr. Kumasaka is administrator of the Paumalu Earth Station.

that every available space in the controlled storage area is judiciously utilized.

The parts are stored according to their uniqueness to the system. For example, spares required for the transportable are separately stored and separate inventories are maintained.

As Bob explained, "the name of the game in supply work is to provide station support to insure adequate and appropriate spare parts and materials are on hand at all times."

Bob Makizuru speaks from experience since he spent his entire military time in and around some of the biggest signal supply depots.

Kaul brothers dominate ping pong tournament

COMSAT Labs held its annual table tennis tournament recently. Pradman Kaul retained his men's singles title as he defeated his younger brother, Pradeep, in the finals in four games.

Earlier, in the semi-finals, Pradman defeated Kim Kaiser in two straight games while Pradeep defeated George Szarvas, also in two games.

The doubles title was won by the Kaul brothers in an exciting match. They beat George Szarvas and Ajit Sabnis in five games.



Sydney L. W. Mellen, Director, and guest, Susi Lei, at dinner.

News from Geneva

BY ERIKA HOFMANN

The European office held a small Christmas party on December 17 at the Hotel du Lac in Coppet, about 10 miles outside the city, overlooking Lake Geneva. After cocktails and welcoming our guests, we sat down to a most elegant dinner: fish paté, barbecued fillet steak "à la provençale," followed by a flambéed dessert, spectacularly presented by two waiters holding the outsize dish.

Later, a three-man orchestra provided music for dancing which continued into the early hours of the morning. We hope that all the other

COMSAT locations enjoyed their Christmas parties as much as we did ours.

A pleasant surprise at our dinner was the presence of our old friend Susi Lei, who had just returned to Switzerland after an exciting year in Washington, where she had been working in International.

Despite all the good memories Susi has from her three years with COMSAT, she has now decided not to come back to us in Geneva. Instead she will soon start an interesting-sounding job with the microbiology department at Basle University.

Mrs. Hofmann is administrative assistant in the European office.

Ecos de la Montana

By LUIS R. RODRIGUEZ

Our Christmas celebration started real early this year at Cayey. The CCEA held its annual party on December 10 at the Falmar's house. An enthusiastic crowd of better than 75 percent of our staff, accompanied by wives and kids, enjoyed the party which started around 8 p.m. and lasted to 3 a.m. the following morning, thus affording personnel getting off at midnight an opportunity to attend.

Jim Shreve, accompanied by his lovely wife and Bill Hanson, both from Headquarters, were our guests.

Music was provided by a "typical island combo" as a courtesy of CCEA president Frank Falmar. There was food to spare and as is customary at Christmas time in Puerto Rico the "pernil asado" was enjoyed by all.

Presents were given to all employee's children under 12 years of age and two other gifts were raffled among the adults.

Ralph Camacho, formerly with the Air National Guard, is a new member of the Cayey family. He joined us as a technician on December 20, 1971.

Ada A. Gonzalez, our former gal Friday, also rejoined us on January 3, 1972. She has worked with us in the past on a contract basis.

Marisol Castanera, daughter of our station manager, was married to David Horovitz on December 15 at the University of Puerto Rico faculty club. The couple left on December 20 to visit his parents in Lucerne, Switzerland. From there they flew to Tokyo via Tel Aviv and Hong Kong. David, formerly with the Hilton Hotels, will be working for the Okura Hotel Corporation in Tokyo and Guam.

R. C. Scott, Vice-President and General Manager, Western Union International, visited the station on December 29, accompanied by his family. They toured the station aided by John Gonzalez, operations supervisor on duty.

Mr. Rodriguez is administrator of the Cayey Earth Station.



Technician Otto Irizarry-Muniz visits with Headquarters staffers Bill Hanson and Jim Shreve and Mrs. Shreve (left to right) at the CCEA Christmas Party.

At Brewster

By ROBERT E. SANDERSON

The BCEA Christmas party was held on December 17. Cocktails were served at the home of Bill and Jean Cook in Okanogan. Later in the evening, everyone went to Carpenter's for dinner and dancing. The "hardier" ones again gathered at the Cook home in the wee hours of morning for ham and eggs. Comment: the best Christmas Party ever.

We did indeed have a white Christmas, along with high winds on December 25. So much snow came down that the access road to the station was closed. Crew shift changes were accomplished only through the use of a Sno-Cat vehicle.

Arrangements for a family snow

Mr. Sanderson is electronic maintenance supervisor at The Brewster Earth Station.

party are proceeding with great enthusiasm. The party will be held February 5 at Echo Valley Ski Lodge near Chelan.

Maddox, Swensen win Plaza chess

John R. Maddox, Technical, and Robert D. Swensen, Domestic Systems Office, have placed first in the Experienced and Novice categories, respectively, at the Plaza in COMSAT's 1971-72 winter chess tournament.

Swensen swept all his matches without a defeat, while Maddox tied against Dennis Beaufort and won the rest.

The parallel contest at COMSAT Labs is still under way. W. L. Pritchard, Director of the Labs, and Tom Throop are in contention in the Experienced category. The Novice title will be decided between J. M. Sandor and Irwin Rowe.

1971: a year of progress, problems and promise

By STEPHEN D. SMOKE

COMSAT opened and closed the year 1971 with highly successful launches of the new INTELSAT IV satellites.

The first of the INTELSAT IVs was launched from Cape Kennedy, Florida, on January 25 and placed in commercial operation over the Atlantic Ocean on March 26. The second satellite in this series was launched on December 19. It was temporarily halted over Colombia, pending a decision on whether to position it over the Pacific Ocean, or the Atlantic as originally planned. After the successful launch of the third IV on January 22, 1972, the second satellite was rescheduled for Atlantic service.

The INTELSAT IV satellites, with a capability of about 5,000 circuits plus TV, are part of the improved global satellite system that will result from replacement of the initial system of 1,200-circuit INTELSAT III satellites established in July 1969.

A new standard antenna was completed at the Andover station to operate with the Atlantic INTELSAT IV satellites. Second antennas are also planned for both the Andover and Etam stations for two-satellite operation in the Atlantic area, and to provide full redundancy. In the Pacific area, the Jamesburg and Brewster stations will operate with only one INTELSAT IV satellite. The necessary redundancy already exists at Jamesburg, and Brewster will be modified to provide full backup capability as well.

In the global system, the addition of 12 new antennas at 9 station sites in 9 different countries raised the worldwide network of terrestrial satellite facilities to 63 antennas at 52 sites in 39 countries.

The growth in the number of

Mr. Smoke is a COMSAT senior information officer.

new earth stations around the world and the expansion of international communications by countries having stations resulted in an increase in satellite system utilization to approximately 5,800 equivalent half circuits, about 40 percent above a year ago.

COMSAT accounted for 43 percent of the total in providing U.S. international communications services, as well as services to Hawaii, Alaska and Puerto Rico.

Total hours of television transmit/receive time in the system as a whole increased by almost 50 percent, but the COMSAT portion of the increase was small.

On March 1, COMSAT followed its earlier filing with a filing at the Federal Communications Commission for authority to provide multipurpose domestic satellite services to meet the needs of users other than AT&T. The latter would be served under the earlier proposal. The multipurpose service would include three high-capacity satellites in orbit, one as a spare, and a spare on the ground, along with more than 130 earth stations on the U.S. Mainland, Hawaii, Alaska and Puerto Rico. Estimated investment is about \$250 million.

This matter is still pending before the Commission.

When the Commission authorized the 720-circuit TAT-5 cable and INTELSAT IV (5,000-circuit per satellite) programs in 1968, it also introduced a proportionate fill concept designed to become effective when the new cable and satellite facilities became operational.

On May 14, 1971, the Commission ruled that unfilled cable and satellite capacity should be activated on the basis of five satellite circuits in the Atlantic basin for every cable circuit between the U.S. and Europe.

On October 19, the Commission revised its May 14 ruling to apply to cable and satellite circuits between only the U.S. and Europe, and established a ratio of one satellite circuit for each AT&T cable circuit between these points. The effect of the new path concept approximates COMSAT experience under the previous basin concept. A separate formula was established for the record carriers.

On May 21, 80 members of INTELSAT succeeded in negotiating Definitive Arrangements after more than two years of deliberation. Like the present interim arrangements, the new arrangements consist of two separate but related documents, an intergovernmental agreement and an operating agreement signed by the governments or telecommunications entities designated by the respective governments. COMSAT is the U.S. signatory to the operating agreement.

The Agreements were opened for signature in Washington on August 20 and will remain open for signature or accession until February 20, 1973, a period of 18 months. The agreements will go into force when two-thirds of the 80 INTELSAT members as of August 20 (54) who also hold two-thirds of the investment quotas, adhere to the agreements.

At year-end, 19 countries representing 60.165 percent of the quotas had become signatories to the agreements; 41 countries had signed subject to ratification, acceptance or approval; Malaysia has signed the intergovernmental agreement, but not the operating agreement; and three countries (Finland, Burundi and Haiti) had signed subject to ratification which would make them members of INTELSAT when the Definitive Arrangements go into force.

COMSAT participated in the U.S. delegation to the World Administrative Conference on Space Communication held in Geneva June 7 to July 14. The purpose of the conference was to review the use being made of the frequency spectrum, and to consider allocation of additional frequencies for satellite communications.

The conference resulted in a continuation of shared use of the 4 and 6 GHz bands by satellites and terrestrial microwave systems. In addition, the conference allocated a 500 MHz uplink between 14.0 and 14.5 GHz exclusively for satellites, but split the downlink into 250 MHz between 10.95 and 11.2 GHz and 250 MHz between 11.45 and 11.7 GHz to be shared by satellites and broadcasting (any receiver other than a satellite earth station).

The conference also allocated an uplink between 27.5 and 31.0 GHz and a downlink between 17.7 and 21.2 GHz exclusively for satellites.

With the approval of the FCC, COMSAT on July 1 reduced its tariffs to the carriers by 25 percent in the Atlantic area, from \$3,800 per month for a leased voice grade half-circuit to \$2,850. The present carrier rate for comparable service is \$4,625.

At that time, COMSAT also said if certain premises were realized it would further reduce tariffs in January 1972 by 12½ percent in the Atlantic area and by 20 percent to Central America, Hawaii and the Western Pacific.

In a letter to the FCC on December 29, Dr. Joseph V. Charyk, COMSAT President, said COMSAT does not plan a second stage reduction in the beginning of 1972 because of the failure of the premises to be realized. Year-end communications satellite traffic levels fell substantially short of carrier customers' forecasts last summer, Dr. Charyk said, and he noted:

"... there remain continuing uncertainties with regard to plans for sharing between undersea cables and satellites; and there also remains the need for protecting Atlantic area satellite capability by the successful launch of another INTELSAT IV series satellite in the new year."

On October 26, COMSAT submitted written testimony to the FCC in the COMSAT rate proceeding which was initiated in June 1965 when Early Bird went into commercial operation. The proceeding was recently activated by the Commission, looking toward the establishment of appropriate rate of return and tariff levels for COMSAT. Hearings will begin the first part of this year.

On August 6, COMSAT and the Government of Nicaragua formed a new company, NICATELSAT, which will provide expanded international communications services for Nicaragua through an earth station under construction near Managua. COMSAT holds 49 percent of the stock in the new corporation, with 51 percent owned by TELCOR, a telecommunications entity chartered by Nicaragua.

Progress was made in COMSAT/INTELSAT research and development during the year. The \$2.88 million COMSAT contract from NASA becomes of more definitive importance in light of the WARC allocation of bands for satellite communications in the 10 to 20 GHz range. This contract calls for a determination of minimum power margins required for advanced communications systems in the 13 and 18 GHz bands, and for a study of weather interference phenomena at these frequencies. Part of the contract calls for COMSAT development of a transponder for use in the NASA ATS-F experimental satellite. An engineering model of the transponder has been completed.

Satellite service on a demand assignment basis will become possible in the Atlantic area for the first time within the next few months. The SPADE equipment, developed by the Laboratories, has already been installed at the Etam station. Similar installations are expected to be completed during 1972 in Germany (first quarter), followed by France, Italy, Canada, Argentina and Greece.

Development of time-division multiple-access techniques and systems continued during 1971. Plans are under consideration for delivery of prototype equipment by early 1974. This is a system for the digital transmission of voice communication which, through more efficient use of satellite power, could significantly increase the capacity of an INTELSAT IV transponder.

E. N. Wright named as ICSC/T delegate

Effective January 1, Edward N. Wright, Assistant to the Vice President-Technical, is the new U.S. delegate to the ICSC Advisory Subcommittee on Technical Matters.

Mr. Wright succeeds Wilbur L. Pritchard, Assistant Vice President and Director of COMSAT Labs, who has served as the delegate for the past three years.

Dr. Burton I. Edelson, Assistant Director, COMSAT Labs, will serve as alternate delegate.



Mr. Peterson

COMSAT director named to UN post

Rudolph A. Peterson, retired President of Bank of America and a member of COMSAT's Board of Directors since February 1969, was recently named head of the United Nations Development Program, replacing Paul G. Hoffman who retired after 13 years.

Secretary General Kurt Waldheim welcomed Mr. Peterson as a man with a "distinguished record in banking and economic development."

Mr. Peterson, 67, was born in Svenljunga, Sweden, and came to the United States at the age of 2. He graduated from the University of California at Berkeley in 1925.

Bargellini leads session

Dr. Pier L. Bargellini, senior staff scientist, was chairman of the communication systems session at the AIAA 10th Aerospace Sciences meeting in San Diego on January 19.