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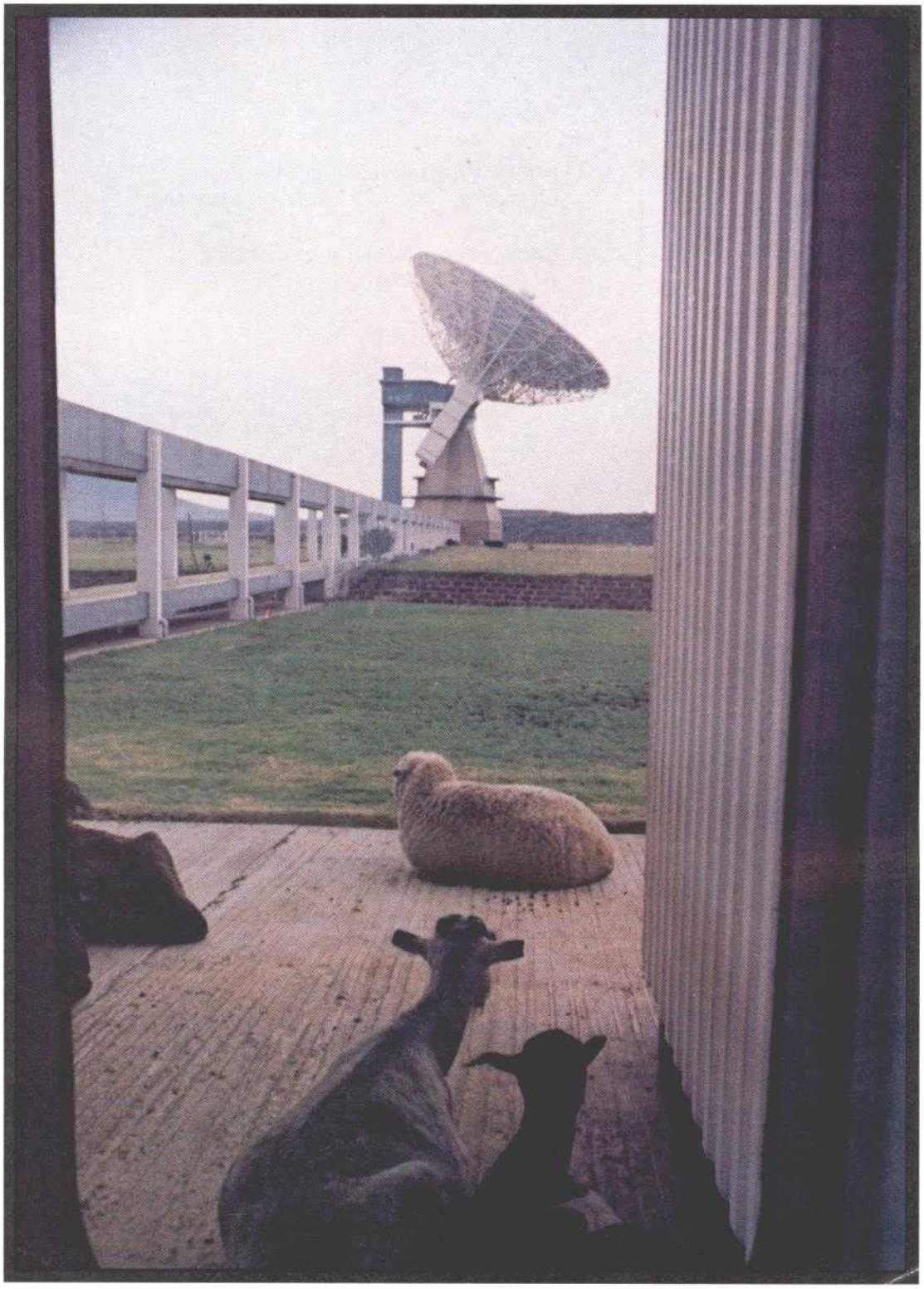
Volume 3 Number 4

SATELLITE Pathways



COMSAT COMMUNICATIONS SATELLITE CORPORATION
COMSAT GENERAL CORPORATION

SATELLITE Pathways

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Cover. *A view from the Control Room of the Kenya Earth Station in the Rift valley links the old with the new, the past with the present.*
Photo by J. T. McKenna

"Can you bring the games to Iquitos?"

By Dr. P. L. Bargellini and J. Kaiser

A COMSAT Labs portable antenna and an INTELSAT satellite brought the World Cup Soccer Games to the people of Iquitos on the Amazon River in Peru.

WHAT HAD BEEN A well-planned, orderly and interesting symposium in Peru to discuss the Andean region nations' plan to use satellites for domestic and regional communications concluded in a flurry of activity for COMSAT and INTELSAT attendees, the result of which, once again, clearly demonstrated the versatility and capability of the INTELSAT global satellite system.

The activity was the direct result of a query by the Director General of ENTEL Peru on the final day of the symposium. Was it possible to bring live telecasts of the World Cup Soccer Games to Iquitos, a city with a a population of 150,000 on the Amazon River.

As far as symposia were concerned, the one we were attending in Lima had followed its general schedule. More than 150 participants were in attendance at the gathering organized by INICTEL, ENTEL Peru, the Geophysical Institute of Peru, ASETA and EUROSPACE. Papers presented were meant to demonstrate the availability of satellite technology from possible sources in the United States, Canada and various European countries.

Dr. Bargellini is Senior Scientist, COMSAT Laboratories.

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

A priest blesses the antenna as ENTEL Peru representatives and technicians and government officials look on.

The Europeans emphasized their current experimental satellite programs such as SYMPHONIE, OTS, SIRIO and the forthcoming ARIANE launch vehicle, as well as future programs such as ECS, H-SAT and MARECS. The Canadians conducted demonstrations of TV reception via the HERMES (CTS) satellite using very small (0.5- and 1.0-meter) antennas. U.S. representatives emphasized NASA's Shuttle Program, the capabilities of several aerospace and communications industries and the activities and operational successes of COMSAT and COMSAT GENERAL.

Among the papers presented were "The Role of the INTELSAT System in meeting International and National Telecommunication Needs," by Dr. Santiago Astrain, Director General of INTELSAT, "COMSAT General Corporation Algerian and ARABSAT Consultancy Programs," by COMSAT GENERAL's Dr. R. C. Barthle, and "A Review of U.S. Satellite Communications Systems Technology," by Dr. P. L. Bargellini of COMSAT Labs. Also attending the symposium was Mr. John A. Johnson, Chairman and Chief Executive of COMSAT GENERAL.

Although conclusions cannot be drawn at this time because of the difficult institutional, economical and technical problems, it appears that Peru, Colombia, Ecuador, Venezuela and other South American countries will at first install earth stations for domestic and regional traffic, leasing transponders from INTELSAT. At a later stage, one or perhaps two regional satellite systems (Projects CONDOR and SATCOL) may materialize.

But, back to our request from ENTEL Peru's Director General Ing. Jorge Menacho Ramos: Would it be possible to install a TV receive-only station in Iquitos to permit the rebroadcasting by a local TV station of the World Cup Soccer Games to be played in Buenos Aires, Argentina, starting June 1?

Situated on the Amazon River, in the northeast region of Peru, bordering Colombia and Brazil, Iquitos is connected to Lima only by HF radio; consequently, the existing system could not carry TV. A few hours and a couple of telephone calls from Lima to COMSAT Labs later we were able to assure the Peruvians that suitable equipment was available at the Labs to make it possible.

It was tentatively agreed that a five-meter antenna and a receiver, equipped with a good parametric amplifier operating at room temperature would be adequate, provided an appropriate amount of ra-

1978 World Soccer Games sets satellite record

The 1978 World Soccer Championship recently won by Argentina was the world's biggest satellite television event, according to INTELSAT, with indications that it surpassed even the 1976 Montreal Olympics in popularity, as measured in numbers and hours of international telecasts via satellite.

The number of transmissions and receptions of the 1978 World Cup games totalled 1,364 with each game transmission averaging two hours, accounting for a total of 2,728 hours of transmissions and receptions worldwide.

Additionally, the INTELSAT Operations Center in Washington estimates that there were about 400 transmissions on the system of World Cup material, other than the actual games themselves. These additional transmission orders account for another 700 transmission and reception hours, bringing the total for World Cup to over 3,400 hours. The previous record satellite television event was the 1976 Olympics, which generated a little more than 2,600 transmission/reception hours.

The remarkable growth of interest in world soccer is shown when the figures for this year's tournament are compared with those for the 1974 World Cup which generated less than 500 satellite transmissions totalling

diated power was available from an INTELSAT IV or IV-A. There were, however, other items which had to be taken into consideration: INTELSAT's existing plan for the worldwide TV distribution of the games, for one, then the compatibility of those plans with the special requirements of a small, receive-only terminal in Iquitos.

Fortunately, Dr. Astrain's presence in Lima during these preliminary contacts, and his full support, contributed significantly to the eventual success of the experiment.

Drs. Barthle and Bargellini flew to Iquitos (one-and-a-half hours from Lima by jet) for an on-site inspection. Enthusiastic assistance by ENTEL Peru personnel and the use of a borrowed surveyor's compass allowed us to determine that the courtyard adjacent to the TV station transmitter would be a suitable location for the antenna. There seemed to be no obstacle in the direction of the Atlantic Ocean satellites and it appeared there would be no interference from urban sources.

Returning to the Labs we spent the next week on the telephone with ENTEL Peru people and perfecting arrangements with INTELSAT while our Labs' technicians and engineers assembled and checked out the necessary equipment. I also had the opportunity to discuss with Kim Kaiser some of the problems he had inherited back at the Labs, beginning with the assignment of the request from Labs Director B. I. Edelson.

"It started with the inquiry from Dr. Edelson as to whether or not we could get a small terminal into Iquitos to receive the soccer games," Kaiser recalled. "We had a 4.7-meter antenna here at the Labs but no low noise paramp to go with it. We had to make sure that whatever we sent there could be put up in such a way as to 'see' the satellite. Then there were other questions to be answered such as was there an adequate electrical supply.

"But then the real problem: my calculations showed that we could not receive television from a global beam with a five-meter antenna. Getting together with some of the other engineers we determined it might work with a spare satellite maneuvered into a position so that its spot beam would point toward Peru. After much study it was decided that we could use the INTELSAT IV (F-3) satellite over the Atlantic. Etam would receive the TV from Argentina via another satellite, and retransmit it via the IV (F-3) to our antenna in Iquitos.

(Continued on next page)

The antenna, mounted in a backyard in Iquitos, brought the soccer games into this city of 150,000 people.

about 1,500 transmission/reception hours of coverage.

The 1978 World Cup also established a record for the simultaneous coverage of a single event when the final game between Argentina and Holland was telecast or relayed live through eight different earth stations around the world and was received by 63 earth stations.

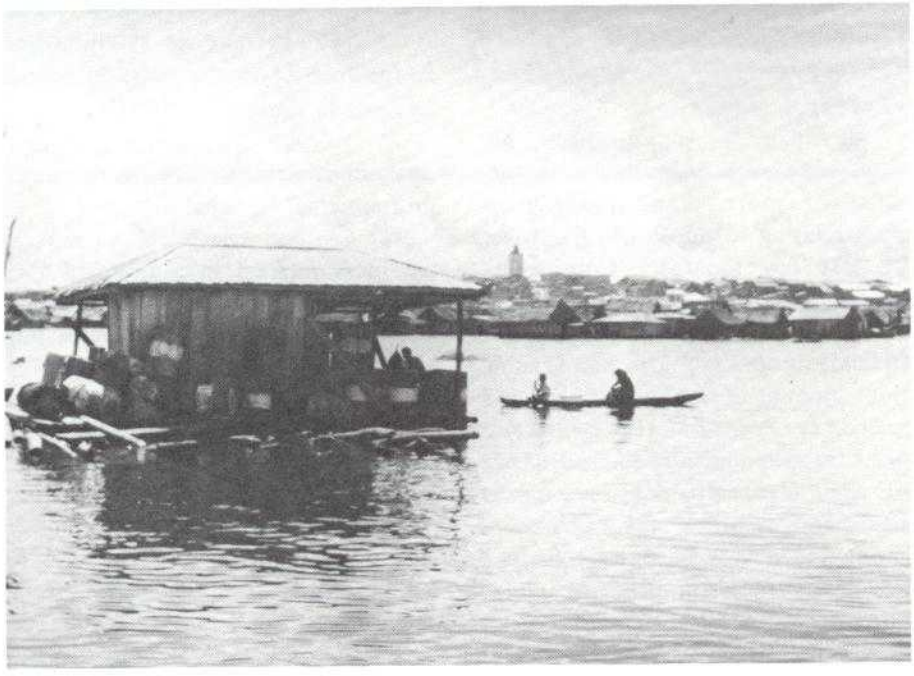
The Manager of the INTELSAT Operations Center, Mr. Larry Covert, said that his center and the international communications authority in Argentina, ENTEL Argentina, had processed more than 10,000 messages relating to the World Cup over the last few months. "Considering its magnitude and complexity, the whole World Cup operation went surprisingly smooth. It took an enormous amount of work by us here and by ENTEL Argentina to coordinate all of the demands and to ensure that the right material was always fed to the right satellite at the right time. The whole operation was further complicated by last-minute changes in orders from countries, depending on the results of matches during the tournament," he said.

"Those countries which showed the most interest in the World Cup were Brazil, Colombia, Ecuador, Europe (European Broadcasting Union via Spain or West Germany), Iran, Iraq, Israel, Kuwait, Mexico, Nicaragua, Peru, Qatar, Saudi Arabia, United Arab Emirates, United Arab Republic, the United States and Venezuela. One surprise satellite viewer for the last two matches was the People's Republic of China," said Covert.

Visiting with Peruvian Indians along the Amazon.

"Then there remained but a few more problems. We had to find down converters and TV modulators and demodulators complete with audio subcarriers. Fortunately, we had some equipment we had used previously in the CTS experiments that just fit the bill. We, in short order, assembled a transmit system for Etam and a receive system for Iquitos with spare subunits for all systems. The TV would be transmitted in a half-transponder mode with 18 MHz peak-to-peak deviation with two audio subcarriers at 5.14 and 5.79 MHz, respectively. The systems were adjusted and tested back-to-back at the Labs. We then borrowed two FET low noise receivers, searched our stores for crystals for the down converters, then packed everything for shipping to Iquitos."

A floating gas station on the Amazon with the skyline of Iquitos in the background.



While all of this was going on at the Labs there was also a flurry of activity elsewhere: Bill Ferguson arranged for Bob Smith to be the lead engineer in Iquitos; Ed Wright obtained antenna certification data; INTELSAT's Dr. R. Parthasarathy obtained the necessary approvals and made determinations of costs of tranmissions; and John Hannon received FCC permission for the transmission from Etam in record time.

Finally, the last phase of the operation was underway. A truck was rented and driven to Miami by Peter Ackerman and Bob Smith. John Castorina took the equipment to Etam. Kim Kaiser spent most of his time chewing his fingernails between trips to the hospital (his wife had undergone an operation) and handling telephone calls, each with the news that something had not gone right: the spot beam only had 31 dBW e.i.r.p., not enough for TV; the frequencies were not correct; Etam might not get the sound from Argentina; and on, and on, and on. However, each problem was dealt with and overcome.

Now the equipment was in Peru. Bob Smith and Fred Seidel were in Iquitos (supposedly) but we had not received word from them that Etam was ready. Then some good news! Although Etam had erratic telex contact, we knew that the antenna was being erected.

In Iquitos there was a great celebration with parades and much ceremony. The Peruvian Minister of Communications had flown from Lima for the occasion. Then came some bad news—they couldn't find the satellite, something had gone wrong with the FET receiver. After some anxious hours we received a

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The Queen Elizabeth 2 enters Denpasar Harbor, Bali, Indonesia.

"Pathways to the World", a new film by COMSAT

By J. T. McKenna

OVER THE PAST DECADE, the technology of satellite communications has advanced to the degree that few parts of the world are unaffected by it. Its methods of application are many and diverse. Our project goal was to incorporate into 28 minutes of film a documentation of some of the applications and effects of this technology.

Our film trip would take us to six countries on four continents—40,000 miles in 30 days. In Bali, Indonesia, we would film on board the *Queen Elizabeth 2;* in Sri Lanka, record a sequence with noted science fiction writer Arthur Clarke; and, in Kenya, the operations of the earth station at Longonot. And all along the way, as a fringe benefit, we would see at first hand the benefits accruing to these societies, the direct result of satellite communications.

The logistical arrangements alone for such a trip would have been difficult at best before satellite communications. Appointments and permissions had to be coordinated with foreign telecommunications and government officials before we left Washington. Teletype operators at COMSAT relayed our requirements and requests by satellite to colleagues in such far-away places as Padukka, Sri Lanka; Bali, Indonesia; and Longonot, Kenya.

Our first stop was Australia, approximately 13,000 miles and 24 hours by jet from the East Coast—a long trip even for the most experienced jetsetters. But once there Australia's international communications system served to minimize the distance between the two countries. (For example, telephone calls from Sydney to the United States can be dialed directly.) In addition, Australia has regular, high-quality communications services to the more than 100 countries which participate in the INTELSAT system.

Our filming schedule called for us to meet the cruise ship *Queen Elizabeth 2* in Bali, Indonesia, a flight lasting some eight hours. Indonesia is one of the few unspoiled tropical places left in the world. There are a few major hotels on Bali and these are set in lush, tropical settings of coconut and palm groves. The Balinese earn their living primarily from growing rice and other agricultural products.

Indonesia is a country that has been able to leap-frog into the twentieth century through the use of satellite communications, both domestically and internationally. Communications with other Indonesian Islands is through a domestic satellite system known as Palapa, and, as the economy of the country expands, the importance of these communications systems is becoming even greater to business and government.

We joined the QE 2 cruise ship, which arrived carrying 1,500 passengers for a short port call as part of its 90-day grand tour of Asia and the South Pacific, to arrange for filming the ship's MARISAT communications system. It was Cunard Lines that installed the Marconi wireless aboard one of its ships at the turn of the century for ship-to-shore communications. And Cunard's QE 2 was one of the first passenger ships to be equipped with a COMSAT GENERAL MARISAT terminal. From its staterooms, telephone calls can be made, via MARISAT, to any part of the world, and telex service is available through the ship's radio room or telephone exchange.

Passengers cited personal experiences to emphasize the advantages in having such a system available: a businessman received New York Stock Exchange reports twice a day;

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COMSAT's filmmakers prepare to "shoot" a scene with Arthur Clarke inside the Padukka, Sri Lanka, earth station.

Mr. McKenna is a COMSAT Information Officer.

"Pathways to the World"

Clockwise beginning at top left: Sinhalese children and their King Cobras perform for visitors in Sri Lanka; fishermen examine and repair nets; the traditional Barong dance depicting the conflict between good and evil is performed in Bali; film crew photographs a Masai tribal dance in Nairobi; thousands gather in St. Peter's Square for Easter services with the Vatican Swiss Guard in the foreground; Pope Paul delivers His Easter Blessing at St. Peter's Basilica in Rome.

(Continued from page 5)

cruise passengers told of their conversations with relatives and friends back home and their amazement at the speed and clarity of their calls. As one passenger said, "It is absolutely amazing to be able to talk with such clarity to friends thousands of miles away while cruising at 27 knots in the South Java Sea." Ship's officers felt MARISAT had made their housekeeping work easier and more efficient. The system is used regularly to relay inventory data, payroll information and operational reports back to Cunard's home office in London. Prior to MARISAT, such reports would wait for days to be transmitted to London.

In the radio room entering Singapore Harbor, high frequency radios from tens of ships could be heard trying to contact Singapore radio as they approached the harbor. QE 2 Radio Officer Butterworth explained that such calls, like those being heard in Singapore Harbor, were regularly delayed. MARISAT, however, can be used to make immediate contact with a port, eliminating the long delays experienced in the use of conventional maritime radio systems. It is this immediacy of communications offered by MARISAT which brings on addiction to the system, said Butterworth.

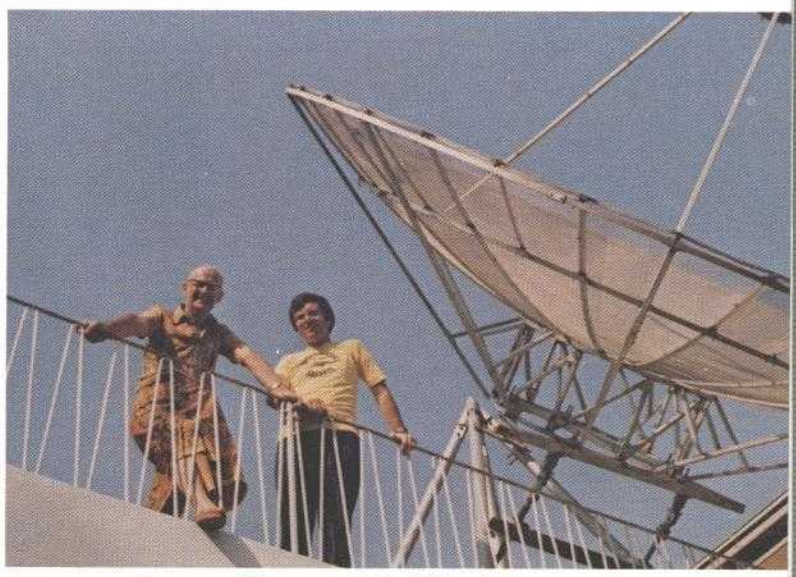
Our next stop was Colombo, Sri Lanka, where we were to meet with the noted science fiction writer, Arthur C. Clarke. Here we found a most interesting country. People usually recognize Ceylon tea, but few realize that it comes from the "Land of Replenishment"—Sri Lanka. The country is a relatively small island located off the southern tip of India in the Indian Ocean. Its exports include its famous tea and large quantities of sapphires and other gems. With banking and agriculture expanding, a more modern communicating capability is needed.

Arthur C. Clarke lives in a comfortable two-story home in Cinnemon Gardens, a residential area near the capital city of Colombo. In a film segment, Clarke, who is generally recognized as the father of the communications satellite concept, discussed his original idea of using a satellite for communications and dwelt on future satellite systems and their possible effects on our lives. He emphasized the opportunities satellites offer societies to expand the educational level of their people. "For developed nations," said Clarke, "individuals may one day use a satellite system to compose their own home or office international newspaper, containing only those subject areas of interest, printed on a cathode ray tube from information stored at an international information center."

Only a few years ago, according to Clarke, it took days and sometimes weeks to contact his correspondents in London or New York. Today, the earth station for satellite communications in Sri Lanka provides the same service in a matter of seconds. The earth station is located in a small village called Padukka whose people live in a style long past for most of the world; oil for stoves is transported in barrels on ox carts, while men make sarongs and batik shirts with their antiquated manual sewing machines. But behind Padukka's town center is the 30-meter communications antenna which gives Sri Lanka access to the same modern international communications system as in the most developed countries of the world.

After our filming session with Clarke we flew to Nairobi, Kenya. Today, 25 percent of INTELSAT's membership is composed of African nations. Kenya, a leading nation in the emerging Third World, was a pioneer among African nations in the establishment of international communications by satellite. News from Africa was often delayed for days before satellites were introduced in the early 1970s. Today, wire service and newspaper reporters use satellite circuits out of Kenya to transmit news to the world.

Kenya's earth station is located at Longonot, about 45 minutes from Nairobi, in the Rift Valley. Sheep, goats and wild giraffe can be seen grazing around the earth station. The control building has a very space-age design. Inside the main entrance is a spiral staircase leading to an observation area. At the top is a foot pedal which opens a set of sliding glass doors to reveal the control room below. The architectural design of the building gives the visitor the feeling of being in a spaceship.



Noted writer Arthur Clarke (left) and COMSAT's Jim Mckenna beside rooftop antenna at Clarke's home in Sri Lanka. The antenna has been used with ATS communications satellite experiments.

After filming a news story about Kenya's economy, which was sent to the U.S. via satellite, we flew to our final foreign location—Rome. Here we filmed an Easter Sunday service at the Vatican. On Easter Sunday the Pope delivers a brief talk and gives his blessing, known as the "Urbi et Orbi," from Saint Peter's Basilica.

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Recollections of Edinburgh

By Betty Poulsen

Edinburgh can have sunny, pleasant weather. As we flew into the airport, over the Firth of Forth, the day was a gorgeous one with blue sky interspersed with fluffy cumuli. Little did we think that it would be the only sunny day for the duration of our stay in this pleasant city. Every day thereafter, or at least a part of each day, held rain, dark clouds and cool temperatures.

However, notwithstanding the weather, the visit to Edinburgh was one of the most pleasant ever. Charming ladies from the British Post Office met all delegates and members of INTELSAT and COMSAT when they disembarked at Edinburgh Airport. Transportation was provided to hotels smack in the middle of the city, just on the edge of old town, but in "new" town, which was built in the 1880's.

The facilities for the thirty-third meeting of the Board were very good, being held in the Adams Room of the George Hotel. The George Hotel was conveniently located within walking distance from all other hotels -- provided one had a raincoat and/or an umbrella.

The opening of the meeting included a short address by Mr. J. Hodgson, Senior Director of External Telecommunications, who made note that the meeting was a "first" for the INTELSAT Board of Governors in the United Kingdom. Mr. K. Grover, Chairman of the Scottish Telecommunications Board, welcomed the Governors to Scotland. The Most Honorable Kenneth Borthwick, Lord Provost of Edinburgh, next welcomed the INTELSAT representatives to the Capital city of Edinburgh. Wearing the ornamental pendant, the symbol of his office, the Lord Provost spoke of Scotland, describing it as an autonomous state with its own banking and legal system.

There was a reception held on the first evening of the meeting at the Assembly, a lovely old building used for concerts and community affairs. The ballroom contains three huge crystal chandeliers that sparkle multicolored reflections. A cold buffet held ham, salmon, shrimp and Chinese rabbit pie (game pie), cheeses and sweets. Scottish cuisine challenges the French! There was also a hot buffet with the traditional roast beef accompanied with very fine wines.

Friday night's reception was given by the Lord Provost and the members of Edinburgh city council at the city chambers in Old Town. During cocktails and after the buffet supper, entertainment was provided by a group of dancers, men in tartain kilts and girls in swirling skirts doing the delightful light steps of the traditional dance.

The weekend was a pleasant change from sitting in the conference room. Saturday was a day to tour, shop, play golf, watch the bagpipe contest in the park, walk the ''Royal Mile''. . . The Edinburgh Castle is a major attraction to visitors. It sits high atop the city, overlooking the new town and the park and, beyond, the Firth of Forth. To reach the castle, one walks the Royal Mile -- up -- up -- up. The Castle is Edinburgh's oldest building still in use. It houses the Scottish National War Memorial. The esplanade is the scene of the famous Military Tattoo held annually at Festival time.

The first recorded fortifications built on the castle site date back to the seventh century, but wars between England and Scotland led to their destruction. The oldest fortification now standing dates to 1076. The Half Moon Battery, from which the one o'clock gun is fired, dates from 1574. The Scots say they can spot a visitor to Edinburgh when the one o'clock gun fires. A resident will check his watch, but a visitor looks around to see who's shooting.

Cable and Wireless, Ltd. hosted a delightful day on Sunday. Buses carried guests to the "Borders", the area between Scotland and England. En route we visited Bowhill Castle with its 17th century hand painted Chinese wallpaper, and Mellerstain Castle with its Italian gardens and priceless Gainsboroughs, Van Dycks and others. We visited Dryburgh Abbey, a twelfth century abbey in ruins as a result of the border wars. Adjacent to the Abbey, in the heart of Sir Walter Scott land on the banks of the Tweed, is the charming Dryburgh Abbey Hotel where Cable and Wireless hosted a roast beef and Yorkshire pudding luncheon. To complete a perfect Sunday, most of us went back to our respective hotels, or some gathered in pubs, to watch the final match of the World Soccer Cup -- via satellite, of course.

The visit of the thirty-third meeting of the Board of Governors culminated with a traditional Scottish dinner at the North British Hotel. The menu consisted of Poacher's Broth, Cream Haddie Auld Reekie, the "Chieftain o' the Puddin' Race wi' a' th' Honours, Black Angus Stirk wi' Itherbye Attours and Fruits o' th' Soil, Scotch Trifle and Tassie o' Bean Bree''. The most interesting course of this dinner was the Chieftain of the Race with honors . . . the Haggis, a mixture of ground sheep heart, liver and lights mixed with oatmeal and stuffed into the sheep's stomach. The ''wi' honours'' ceremony is the Chieftain carrying the haggis on a tray, accompanied by bagpipe music. The Chieftain thrusts his dagger into the stomach and drinks a toast before the dish is served. The haggis is served with a spoonful each of ''neets'' and ''tatties'', translated to be turnips and potatoes, both mashed. Absolutely delicious!!

One leaves Scotland with good memories of friendly people, beautiful countryside, with its oat and barley fields and grazing sheep and of the strange phenomenon of an almost-never-setting sun.

Ms. Poulsen is a Coordination Assistant in the INTELSAT Management, Administration and Budget Department.

INTELSAT Board elects Canada's Perras Chairman; Australia's Payne V-Chairman

The Thirty-third Meeting of the INTELSAT Board of Governors was held in June in Edinburgh, Scotland, at the invitation of the U.K. Signatory. Twenty-seven Governors representing 80 of the 102 Signatories were present for all or part of the meeting. (With the accession of Fiji on May 4, 1978, INTELSAT now has 102 members).

The membership of the Board has increased as the United Arab Emirates is now represented separately rather than as a member of Arab Group III. Among its actions the Board:

Organizational and Administrative Matters

- Elected by acclamation Mr. Marcel Perras of Canada and Mr. Randolph Payne of Australia as Chairman and Vice-Chairman respectively of the Board of Governors, for one year terms beginning June 28.
- Reappointed Mr. Otto Schmeller of Germany as Chairman and Dr. Kunishi Nosaka of Japan as Vice-Chairman of the Advisory Committee on Technical Matters, and Mr. Charles Steffen of Switzerland as Chairman and Mr. Neill Tuckwell of Australia as Vice-Chairman of the Advisory Committee on Planning.
- Approved specific positions and grades, to implement its previous decision on staffing in the Operations and Development Directorate; approved the proposed structure, staffing and grade levels for the INTELSAT operations and communications center; established the posts of Internal Auditor, secretary and Accounting Systems and Procedures Officer.
- Authorized the Director General: to conclude an agreement with COMSAT for use of the COMSAT launch control center, to lease the satellite control center and operations center premises from COMSAT and to purchase such satellite control center and operations center equipment as is applicable to INTELSAT requirements and complete the upgrading program begun by COMSAT.
- Accepted in principle the Arab Group III proposal that INTELSAT on request offer technical and financial advice to developing countries and requested the Director General in collaboration with the Arab Group III Governor to further study and develop the proposal and the way in which it can be implemented.
- Approved extensions to February 12, 1979, of the terms of assignments of Mr. Bartolome Arroyo of Spain and Messrs. Hidetoshi Nishi and Toshitake Noguchi of Japan to work with the staff of the Management Services Contractor.

Technical and Operational Matters

- Approved exercise of options with EMBRATEL, INTELCAM, OTC(A), and Telespazio for the provision of TTC&M services through December 31, 1979; approved award of a contract for CSM services in the 1980-84 period at the Etam earth station; authorized the Director General to solicit proposals from the Signatories of France and Germany for provision of 14/11 GHz CSM services through a Standard C antenna and to negotiate with EMBRATEL and ENTEL for provision of TTC&M services in the SW Atlantic Region for the 1980-84 period;
- Authorized provision of documentation, describing three alternatives under consideration by INTELSAT for the provision of space segment capacity for maritime service, to the July 1978 meetings of the international Joint Venture and the INMARSAT Preparatory Committee and Technical and Economic Panels; and authorized the Director General to conclude with the Ford Aerospace and Communications Corporation an amendment to the INTELSAT V contract to perform a three month study of the incorporation of the maritime communications subsystem on INTELSAT V (F-5) and later satellites.
- Decided not to exercise the INTELSAT IV-A contract option for procurement of additional INTELSAT IV-A satellites.
- Requested the Director General to develop further suggested guidelines for earth station implementation and to provide these to the Atlantic Operations Representatives and the Advisory Committee on Planning for review.
- Approved performance specifications for a single TV-associated Program Audio channel using FM sub-carrier techniques, for introduction into the INTELSAT system by year-end 1979; requested the Director General to inform all users of the need for early implementation of this system; and authorized a study to investigate means for the possible provision in the longer term of more than one TV-associated audio channel.
- Requested the Director to bring to the attention of the Parties, Signatories and INTELSAT Administrations a series of documents on technical considerations relating to ITU CCIR matters which are of concern to INTELSAT and authorized the Director General to submit certain additional documents directly to the Special Preparatory Meeting of the CCIR.
- Requested the Advisory Committee on Technical Matters to keep the Planning Committee informed of the development status and projected availability of advanced modulation/access techniques.
- Decided that the integrated traffic data base form the core for the nominal growth scenario for the future INTELSAT system planning study.

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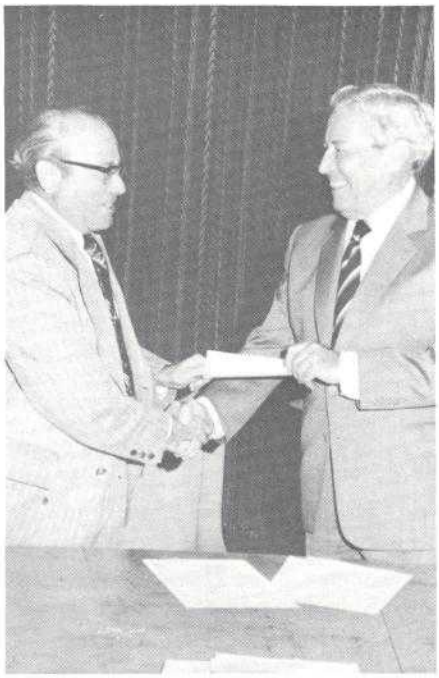
COMSAT assumes mortgage on Plaza headquarters building



A joint working group of COMSAT and L'Enfant Plaza Properties representatives iron out the details of the purchase agreement for the COMSAT Building (photo above). In the photo at right, Lewis C. Meyer, Assistant Vice President, Procurement, (left), hands COMSAT's check to General E. R. Quesada, Chairman of the Board, L'Enfant Plaza Properties.

The Federal Communications Commission (FCC) has approved a COMSAT request to assume an $1,850,000 mortgage on the South Building at L'Enfant Plaza in Washington, D.C., which it is purchasing for $1,807,000 as its headquarters. The Commission said COMSAT's decision to assume the mortgage was consistent with FCC conclusions reached in a 1976 rate case and was in the public interest.

The mortgage is for 14 years at 5.75 percent interest. If the present mortgage is paid in connection with the purchase, COMSAT said, it would have to pay an early payment penalty of $161,000. The Commission said that since the mortgage rate was lower than the current one for new borrowings and failure to assume the mortgage would increase the cost of the property, COMSAT's decision to assume the mortgage was prudent.

Moreover, the FCC said, it had concluded previously that an increase in COMSAT's debt would benefit the ratepayers, and that its allowable rate of return should be computed on the basis of a capital structure that included 45 percent debt financing even though COMSAT then had a 100 percent equity structure.

SBS to build satellite beacon station in Colorado

Satellite Business Systems (SBS) plans to build a satellite beacon station on a 160-acre site 25 miles south of Denver, Colorado, to perform housekeeping functions for its domestic communications satellite system. It will consist of up to four seven-meter antennas and an 8,000-square-foot control building.

SBS has received approval for use of the site, which is in Douglas County near Castle Rock. Construction will start in early 1979, subject to Federal Communications Commission approval, with completion scheduled for one year later.

SBS has been authorized by the FCC to proceed toward establishment of a domestic satellite system. Commencing in early 1981, the system will provide businesses, government agencies and other communications users with private networks for voice, data and image communications. Small earth stations with five- and seven-meter antennas will be sited on rooftops or in parking lots of SBS customers. The system will feature advanced technology and a number of innovations.

(Continued on next page)

American Samoa, COMSAT sign earth station agreement

American Samoa has signed an agreement with COMSAT under which COMSAT will establish an earth station at Tutuila, American Samoa, and provide communications satellite services to the Government of American Samoa (GAS).

The agreement was signed recently at COMSAT's corporate headquarters in Washington by Samoan Governor Peter T. Coleman and COMSAT President Joseph V. Charyk. The new facility, when operational, will provide American Samoa with modern, high quality overseas telephone, telex, data and television services via satellite.

The earth station, to be built, owned and operated by COMSAT, will be located near the Tafuna International Airport at Tutuila and staffed to the maximum extent by Samoans. Construction is scheduled to begin upon receipt of the necessary U.S. Government regulatory documents. The station will communicate initially with Hawaii and the U.S. Mainland, with service to other Pacific points to follow later.

Service to Samoan users will be provided by GAS, which is responsible for providing telecommunications services for American Samoa. GAS will connect the existing ground communications network to the earth station. COMSAT will provide communications services between the earth station and the global satellite system of INTELSAT.

Governor Peter T. Coleman of American Samoa (seated at left) and COMSAT President Joseph V. Charyk (seated at right) sign the agreement under which COMSAT will establish an earth station in Samoa and provide communications satellite services. Attending the signing are (standing left to right) Mrs. Ruth Van Cleve, Mr. Mathew Novick and Mr. George Milner of the Department of Interior; COMSAT's George Lawler; and Mr. Aleki Sene, Director of Communications, Government of American Samoa.

Guests at the signing ceremony in Washington, D.C., included the Honorable A. P. Lutali, Delegate-at-Large from American Samoa, and Aleki Sene, GAS Director of Communications. Also present were the following representatives of the U.S. Department of the Interior, which is responsible for administration of the Territory of American Samoa: Ruth Van Cleve, Director, Office of Territorial Affairs; Matthew Novick, Deputy Director, Finance and Administration; and George Milner, Deputy Director, Programs and Policy.

(Continued from preceding page)

The Castle Rock station will be part of the SBS Tracking, Telemetry and Command network. Among the station's functions will be the transmission of a radio beacon which the SBS satellites will track, permitting their antennas to remain pointed at the United States with great accuracy.

The station will also receive telemetry signals from the satellites, providing data to be used in evaluating satellite performance. Another function will be to monitor the orbits of SBS satellites so that they may be kept in their intended positions within an accuracy of ±.03 of a degree. About 20 persons, most of them electronic technicians, will operate the station around the clock.

The station will consist of a tracking and monitoring antenna for each of the two satellites SBS plans to place in synchronous orbit in the latter half of 1980, plus a third antenna to be used for in-orbit testing of the satellites while they are drifted into position after launch. The third antenna will serve as a backup beacon antenna. Another antenna would be installed for tracking and monitoring when SBS launches a third satellite.

The antennas will be seven meters in diameter and operate in the 12- and 14-gigahertz frequency bands. By operating at these higher frequencies, which are to be used primarily for space communications, the satellite system will avoid interference with existing terrestrial radio frequency communications including microwave, radio, TV, and CB.

SBS will also construct a control station on the East Coast at a site not yet chosen. The two stations, geographically separated, will permit precise ranging for orbit determination. Each station will also serve as a backup for the other.

Worldwide demand for satellite communications expected to double

Worldwide demand for international satellite communications will more than double in the next five years, according to the determination of the recently concluded Fourth Global Telecommunications Traffic Meeting sponsored by INTELSAT.

Figures released at the meeting of 172 international communications experts representing 93 telecommunications entities from around the world, indicate that satellite communications requirements would increase from 14,105 equivalent, full-time, simultaneous telephone circuits at the end of 1978 to 29,282 by the end of 1982, up 108 percent.

The biggest demand is expected to be among those countries surrounding the Atlantic Ocean where communications traffic by satellite is expected to rise by 114 percent over the five years. Traffic in the Indian Ocean Region is projected to increase by 98 percent and in the Pacific Ocean Region by 91 percent.

COMSAT and Massachusetts firm agree on acquisition

COMSAT and Environmental Research & Technology, Inc., (ERT) have announced that their managements have signed a Memorandum of Understanding for the acquisition of ERT by COMSAT.

The purchase price would be a combination of COMSAT stock and cash based on the earnings performance of ERT in Calendar Years 1978 and 1979. COMSAT and ERT noted that the terms are to be embodied in an Agreement and Plan of Merger to be presented to the boards of directors of both companies and the shareholders of ERT.

ERT, a privately held company headquartered in Massachusetts, is engaged in a broad spectrum of environmental services, a major portion of which is the monitoring and analysis of environmental information. For 1977, ERT had revenues of approximately $23 million.

COMSAT stated that to the extent COMSAT stock is offered to ERT shareholders as part of the acquisition, the offering will be made only by means of a prospectus.

Personnel changes announced

The appointment of a Deputy Director led the list of appointments and organizational changes within the Personnel Department announced recently by David S. Nye, Assistant Vice President and Director of Personnel.

Roy A. Greene, newly appointed Deputy Director of Personnel, comes to COMSAT from Honeywell, Inc., where he had been employed for the past 17 years and had most recently served as Director, Employee/Community Relations for Honeywell Information Systems, Federal Systems Operations, McLean, Virginia.

According to Mr. Nye, all elements of the Personnel Department will report through Mr. Greene with the exception that W. B. Lockett, Assistant Director for Equal Employment Opportunity (EEO) and Human Resources Development, will report directly to the Director of Personnel on EEO matters.

Robert A. Dahlgren has been appointed Assistant Director of Personnel for Compensation and Benefits and will assume responsibility for compensation program planning, salary administration, benefits program planning and personnel records.

Donald J. Chontos will assume responsibility for personnel matters at COMSAT Laboratories and will also serve as coordinator for personnel services required by the Communications Products Division and the Communications Systems Monitoring Office of the Research and Engineering Division.

Mosetta W. Blackmon, Manager, Staffing, has acquired the assistance of a Personnel Administrator, Steven J. Parker, whose experience includes employment recruitment, counselling, testing, job development and placement, specializing in the clerical and secretarial areas.

INTELSAT

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- Approved an agreement with Uganda for the preemptible lease of one transponder, and authorized allotment on a preemptible basis of one quarter transponder to France, to meet both countries' domestic telecommunications requirements.
- Approved a request of the U.S. for access, free of charge, by an automatic seismic installation terminal in order to perform experiments for a period of five months commencing July 31, 1978; approved access by two non-standard earth stations, one in Colombia and one in Norway, for operation with domestic transponder leases; approved a non-standard station in Peru for reception of television and associated audio in connection with the World Cup football games; and refused to grant retroactive approval to a non-standard station which had completed a series of television experiments, but which by administrative oversight had not been brought to the Board for approval.

Financial Matters

- By formal vote did not adopt a French proposal that the charge for each of the first twenty-four circuits through a Standard B station be as for one unit of utilization.

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

Third COMSTAR satellite launched successfully

COMSAT GENERAL's third high-capacity COMSTAR satellite was launched successfully from Cape Canaveral at 6:25 p.m. Thursday, June 29.

The 20-foot-tall satellite joined two other COMSTARS in orbit. Like its predecessors, it has the capacity for approximately 18,000 high-quality telephone circuits and the capability of serving the 48 continguous states as well as Hawaii, Alaska and Puerto Rico.

Owned and operated by COMSAT GENERAL, the entire capacity of the COMSTAR satellites is leased to American Telephone and Telegraph Company (AT&T).

AT&T and GTE Satellite Corporation (GSAT), a subsidiary of General Telephone & Electronics Corporation, share use of the satellites and operate the earth stations, integrating the System into the nationwide terrestrial facilities. The System is the first to provide the public with satellite circuits for long distance message telephone calls within the continental U.S. It also is used for communications between Hawaii and the mainland and is capable of serving Alaska and Puerto Rico through earth stations operated by other carriers in those areas.

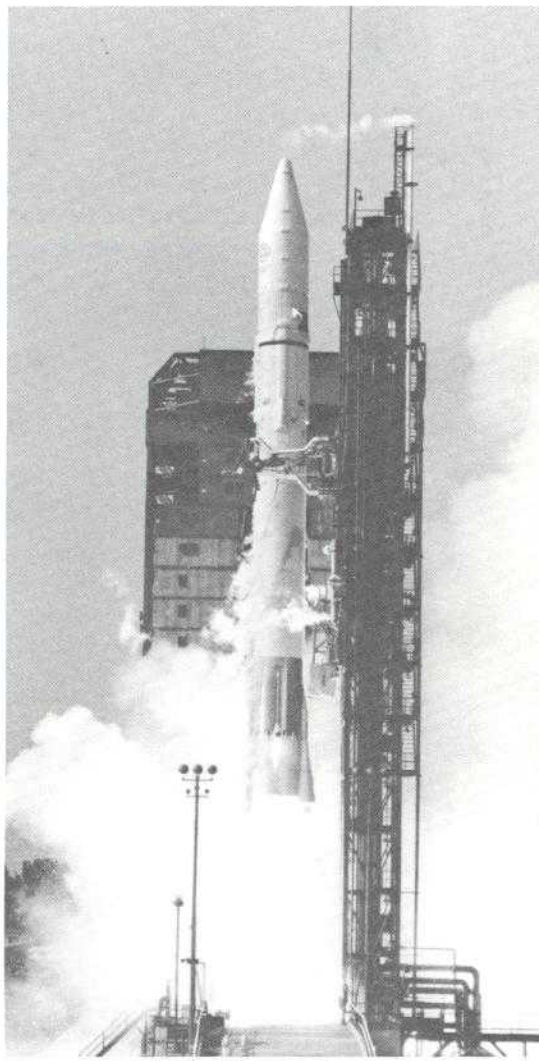
Four COMSTARS were built by Hughes Aircraft Company for COMSAT GENERAL. Three are designated for in-orbit operational use; the fourth COMSTAR is an on-the-ground spare.

The COMSTAR spacecraft has a design life of seven years. Overall height of the spacecraft is 20 feet (610 cm.); diameter, eight feet (244 cm.); weight before lift-off, 3,347 pounds (1,518 kg.); weight in orbit, 1,746 pounds (792 kg.).

Electrical power for the satellite when in orbit is provided by an array of about 14,000 solar cells mounted on the cylindrical body of the spacecraft, providing approximately 610 watts of direct current power. Nickel-cadmium batteries power the satellite during launch and twice-a-year solar eclipse periods.

A special feature in the COMSTAR satellite is the antenna system. Rectangular filter screens cover the reflectors—one with a vertical filter screen and the other with a horizontal screen. This technique permits polarization isolation of the microwave signals so the same frequency can be used twice, in effect doubling the capacity of the satellite by making more efficient use of the radio spectrum.

The satellite's antenna system is configured so that one principal beam covers the entire contiguous 48 states; three smaller spot beams are directed to cover Hawaii, Alaska and Puerto Rico.



COMSTAR D-3

SOCCER

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telex from Seidel: "They sent a priest and during his blessing the satellite came in loud and clear!" Then we got the confirmation from Etam that TV was indeed being received and, with a bit more transmit power, the quality was excellent. From then on the transmissions became routine.

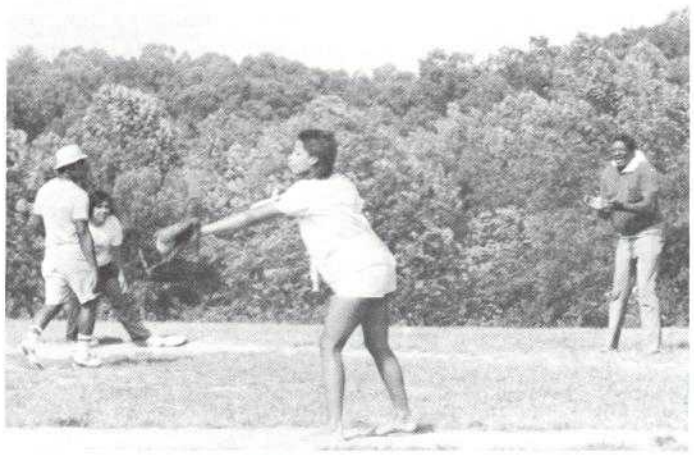
But although the transmissions become routine, the challenge facing the engineers and technicians involved had been other than routine. The three games of June 3, 7 and 11 in which the Peruvian team played were rebroadcast as well as the final game on June 25. Smith and Seidel remember that when Peru won its game the cheers in the City of Iquitos nearly brought down the cables and antenna.

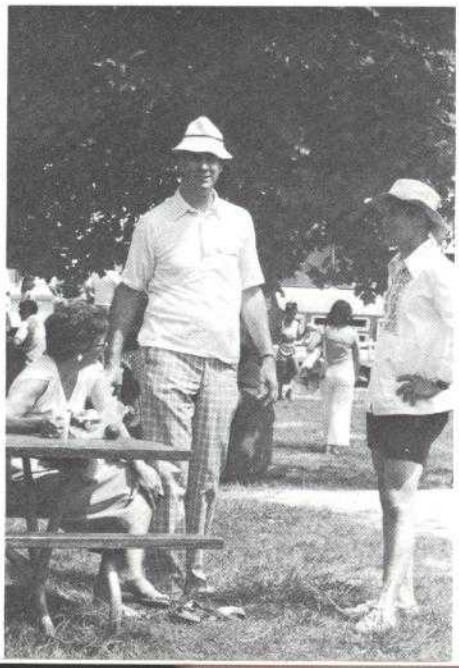
Then there was the feeling of appreciation. Seidel recalls getting into Iquitos eleven hours late because of fog and of difficulties in erecting the antenna. "Frankly," said Fred, the people were all so helpful and friendly I spent a considerable amount of my time doling out jobs to the eager, local folks to make sure they each got a piece of the action."

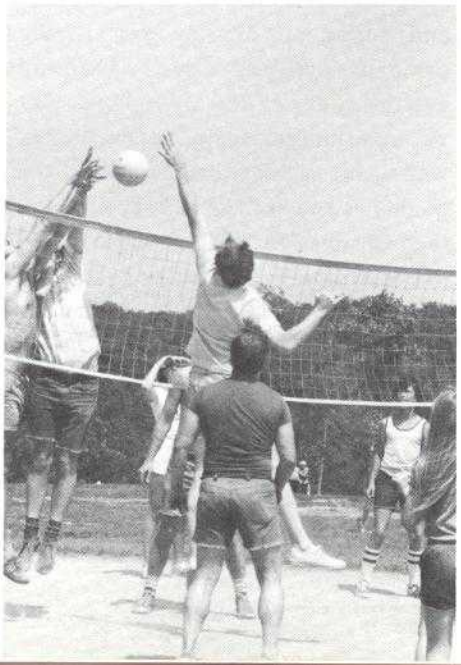
PICNIC '78

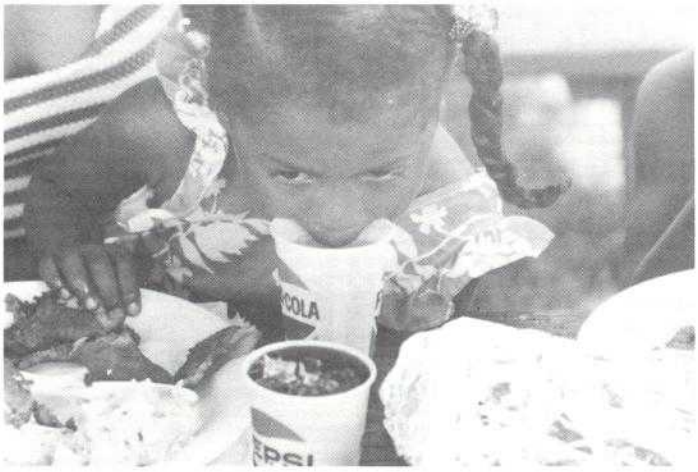
An annual COMSAT Employees Association event

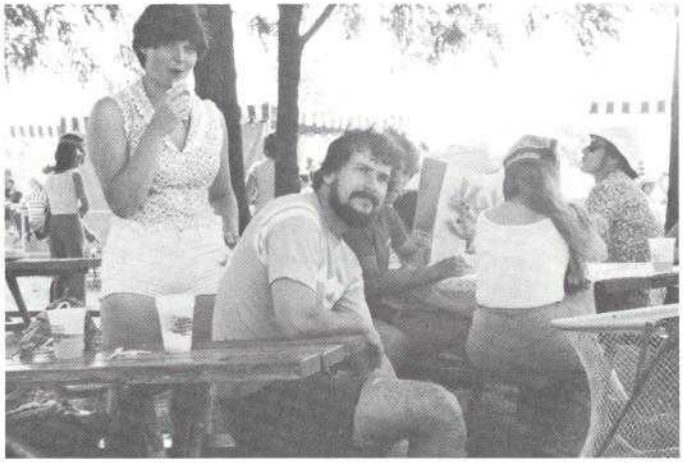
PHOTOS BY M. GLASBY



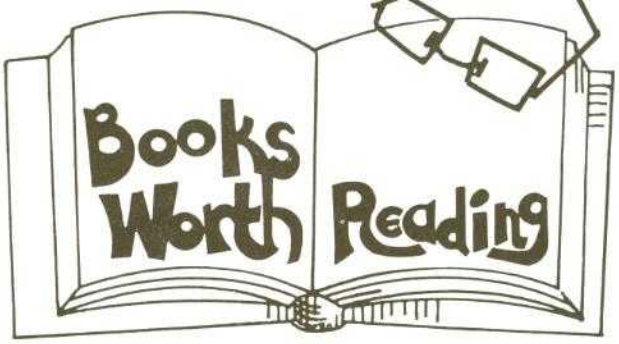









PETE



The Observer's Spaceflight Directory, Reginald Turnhill, Frederick Warne Ltd., London, 1978.

Editor's note. *The following "Author's Introduction" is reprinted from Mr. Turnhill's book now available in the COMSAT Library.*

The Observer's Spaceflight Directory can claim to be the first comprehensive directory covering worldwide space activities to be published. As George Low of NASA generously acknowledges in his Foreword, it is the result of 22 years of first-hand space coverage by the author. The aim has been to expand and update all the information already supplied in the smaller Observer's books of Manned and Unmanned Spaceflight. The larger, more comprehensive format makes it easier to appreciate how, in the pioneering days, unmanned robot spacecraft made it possible for men to reach the Moon; how too, the unmanned planetary explorers are gathering the knowledge and developing the techniques which will soon enable men to move freely around the planets of our Solar System.

Already near-Earth space is humming with man-made activity. Only the most ignorant of the 'What's-in-it-for-me?' sceptics persist with their opposition in the face of the vast contributions to our everyday life already provided by the rival Soviet and U.S. space programmes. Increasingly, fresh contributions are being added by the developing European Space Agency, and by the national programmes of Japan, China and other nations.

Manned flights have yielded astonishing medical benefits. They range from the use of space helmets for saving the lives of premature babies, and spacesuit techniques for treating leukaemia, scalds and burns, to the development of tiny space-developed cardiac 'pacemakers' being fitted to heart-sufferers at the rate of 60,000 a year. Communications satellites, now taken for granted, provide world-wide TV, telephone, telex and data links; nowadays city dwellers, in every country in the world, expect to be able to watch things like the Olympic games as they happen; but in remote places like Alaska and India, village-dwellers are still astonished and delighted when ATS-6 brings them educational TV and medical treatment by a doctor hundreds of miles away who is able to look at an accident case by means of a satellite picture. Meteorological satellites help ships to make faster journeys by telling them where to find favourable currents, and guide them safely through moving ice-packs. Applications satellites, like the U.S. Landsat (formerly known as ERTS), help us to foresee and avoid disasters such as flood, drought and earthquake.

The U.S. Space Shuttle, the world's first spaceplane, will speed up and extend all these simultaneous developments. With a flight a week, we shall see over 300 men and vast quantities of equipment being placed in orbit annually by the combined efforts of America and Europe. Russia's exciting new Space Stations—and other projects not yet revealed—will match and perhaps surpass these efforts. Both East and West will be devoting much time and effort to using zero-gravity conditions for creating new metals and manufacturing techniques, with the long-term creation of space colonies—millions of people living in near-perfect conditions in man-made planets—very much in mind. Such colonies are no more farfetched than were the prospects 20 years ago of landing men on the Moon. And the next generation of "Who's-going-to-pay?" experts can be reassured that such colonies will pay their own economic way by gathering solar energy and selling it to those still on Earth; by exporting their unique high-quality components; and no doubt by providing holiday accommodation and Zero-G hospitals for patients suffering from heart attacks, etc. These prospects are not just the author's private flight of fancy; the detailed plans for them are to be found in NASA's own Outlook for Space, which aims to give back to youth its opportunities for pioneering adventure, and its hopes that man's timeless dreams of Utopia can be fulfilled. At the time of writing, America's search for life on Mars with the Viking spacecraft is still underway; serious long-term studies are also under way about the possibilities of creating—or recreating—a Martian atmosphere by exploding nuclear devices on its frozen Poles. The reverse process of reducing the incredibly dense Venusian atmosphere could be just one step beyond that.

Manned flights to the planets are being brought steadily nearer by Russian work in Salyut space stations. Already cosmonauts have learned to re-cycle the water they drink—even recovering their own perspiration from the atmosphere—so that it can be used over and over again. These are the methods, together with such devices as on-board greenhouses producing food, which in the near future will make possible man's first hazardous expeditions to the planets. Improved propulsion systems, making the round trip less than the 18 months needed at present, will surely follow.

All these exciting achievements and prospects are contained in the facts and figures chronicled in this Space Directory. The second half of the 20th century is undoubtedly the most-exciting, fastest-moving period in the development of mankind.

Amateur radio operators conduct annual Field Day

By Cal Cotner

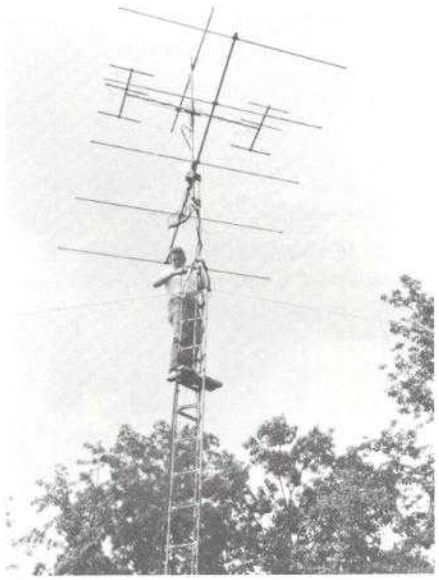
Late June found amateur radio operators from COMSAT, IBM Gaithersburg, and SBS again pooling their resources to enter the annual nationwide Field Day. This event, held annually since the 1930's (except for 1941-1945), combines the aspects of emergency powered communication, a contest, and a campout.

This year, operating under the call W3NN/3, from the grounds of COMSAT Labs, approximately 1,200 contacts were made with other amateur stations during the 24 hour contest period. Three stations were operated simultaneously; one on high frequency voice, one on high frequency CW (code), and one on very high frequency. In addition, a novice station using the call KA3AKV was operated since under the rules this does not change our basic three station entry classification.

As usual, the high frequency CW station, operated primarily by Laurie Gray of COMSAT, Bob Short of IBM, and Ed Bondurant and Gene Mertz of SBS "keyed" their way to an impressive number of contacts. A huge "VEE" beam antenna, 300 feet on a leg and suspended across the empolyee parking lot certainly helped.

The high frequency voice station, set up under the guidance of Chuck Hollister of IBM, also contributed a great number of contacts. Operators there included, among others: Joe Apple and Miles Butcher of COMSAT; Frank Pinkl, Don Wilhelm, and Dave Long of IBM. Antennas for this station consisted of a 3-element "triband" yagi and a 135 foot centerfed "Zepp."

The VHF station did not contribute as many contacts as the other stataions but generated a lot of interest. Rob Whiteley of COMSAT donated his superb, 146-MHz transceiver to the cause. A horizontally stacked pair of 3-element quad antennas built just before Field Day beamed the signal to receptive ears. The 50-MHz amateur band cooperated by "opening" to many parts of the United States thanks to sporadic "E layer" ionization. Among others, operators here were: John Effland, John Rosso, and Dave Weinreich of COMSAT.



Decisions. Decisions. Decisions. Cal Cotner asks himself the question, "Which feedline for which antenna"?

Contacts were also made through the amateur OSCAR satellite. Joe Apple and Andy Lopatin of COMSAT prepared the necessary equipment. The 432-MHz up-link transmitter was loaned by Joe Kasser of COMSAT.

Arch and Charlotte Griffin of SBS, newly licensed novice operators, added a nice bonus to our score. The rules provide that the novice station must be set up and operated by novices without assistance from more experienced amateurs. The equipment used was from the COMSAT Labs station WA3LOS and the antenna was a multi-band "trap" dipole.

Special thanks go to Dave Weinreich of COMSAT for the delicious meals he prepared for the group. Try shopping for five meals for 20 people! Also, Kim Kaiser of COMSAT let us "field test" one of his gasoline powered generators and Miles Butcher arranged a "bottomless" fuel tank to keep us on the air. Clarence Crane and F. X. Coffey loaned rope, power cables, and a 40-foot extension ladder to the cause and many others within COMSAT helped with bits and pieces for the weekend. Cal Cotner of COMSAT was the Field Day chairman.

Mr. Cotner is Assistant Manager, Microwave Systems Department, COMSAT Labs.

COMSAT FILM

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The event is viewed widely around the world via satellite. We completed our filming on Easter Monday with a visit to the Fucino Space Center about 75 miles east of Rome where we documented the processing of a television program through an earth station for worldwide distribution.

The four-week trip had been exacting. The experiences, however, were well worth the inconveniences we encountered: long night flights, early morning arrivals in strange places and negotiations with customs officials over equipment value. And although each country had its cultural differences, the common denominator prevailing in each was the cooperation and friendliness of its people.

Network Bits

Field Correspondents

Andover
Joanne Witas

Brewster
Dorothy Buckingham

Cayey
John Gonzalez

Etam
Bev Conner

Jamesburg
C.B. Marshall

Labs
Norma Broughman
Joan Prince
Blaine Shatzer

M & S Center
Darleen Jones

New York
Stephen Keller

Paumalu
Bob Kumasaka

Plaza
Mary Lane

Santa Paula
Pat Hogan

Southbury
Eileen Jacobsen

ANDOVER. **Jim Warren** is out of the hospital and recuperating at home. **Nancy Dougherty,** Manager, Safety and Health Services, came up with some sound advice during her recent station visit. When asked what precautionary steps we should take when visited by our local, friendly bull moose she replied, "Stay indoors!"

Vacationing is in season: **Bruce Simmons** and family camped in 35 states, visited relatives and friends, and, **Bruce** being an antique car buff, stopped in Reno for a visit to Harrers Antique Car Museum; **Barbara Hayden** and family camped at Prince Edward Island in Canada then toured the coast of Maine; and the **Larry Wood** and **Jerry Bragdon** families got in some camping right here in Maine.

Our congratulations to **Shaun Arness** and **Nancy Haseltine** on their July wedding. —**Joanne Witas**

CAYEY. It seems like only yesterday that our station began operations—June 23, 1968. In Puerto Rican history, it can be considered a milestone. On June 23, 1978, the majority of our personnel participated in a celebration evoking memories of the past 10 years as members of the Cayey family and enjoying the delicious luncheon sponsored by the CCEA.

CCEA meets

P. J. McGranahan (right) congratulates incoming CCEA President Elfrem Castro.

CCEA Luncheon

CCEA held its annual meeting in June and elected **Elfrem Castro** its new President replacing **P. J. McGranahan.**

Station Manager **L. R. Rodriguez** took the opportunity to present ten-year awards to Station Engineer **John Gonzalez,** Facilities Supervisor **Paul McGranahan,** Operations Supervisors

Station Manager Rodriquez (right) presents ten-year awards to Don Emilio . . .

Jose M. Carriles . . .

and Luis Medina.

Efraim Flores, Otto Irizarry and **Elfrem Castro,** and Senior Technicians **Juan Sierra** and **Jose Carriles.**

Cayey's "Ten-Year Club"

So far, 14 of our 18 permanent employees have been able to attain the ten-year milestone while still a part of the COMSAT family.

—**John Gonzalez**

ETAM. **Mike Britner** and **Paul Mauzy** have received their five-year service awards. Vacationers include the **John Formella** family in Canada, the **Spencer Everly** family at Myrtle Beach, South Carolina, and **Paul Helfgott** on a camping trip with the Kingwood 4-H Club.

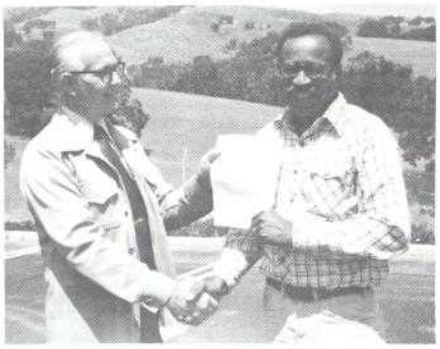
Our station "farmers," **Bill Adams** and **Rich Dean,** are reporting a good crop of hay. **Bill Adams** is back at work following knee surgery. **Donald Riffle** of Shinnston, West Virginia, has joined our staff as a Junior Technician. **Michael Phares** is a temporary hire in the Facilities Department.

It's story swapping time for our garden enthusiasts. With summer upon us and lots of rain the gardens are really blossoming as are the stories of vegetable sizes.

—Bev Conner

JAMESBURG. International Division VP **Richard Colino** visited our station recently and had a discussion session with employees present. Paumalu's Station Manager **Glenn Vinquist** and wife visited our station while vacationing on the Mainland.

Vacationing took on many forms this year for many of the members of



Station Manager Scroggs (left) presents ten-year award to Stan Nubin, Station Administrator.

our staff: **Patricia Blatnik** and family spent their time along California's Klamath River fishing, boating, swimming and touring; **Peter Roberts** spent three weeks "house sitting" for his sister in Hidden Hills while she and her family visited England; **Roy Scheiter** and wife **Betty** entertained relatives from Quincy, Illinois; **Walter Robinson** spent a week catching up on work on his farm; the **Pete Oliver** family entertained Pete's relatives from South Carolina; and the **Jack Inman** family vacationed in Tennessee. **—C. B. Marshall**

LABS. **Dirk VanDerLoo** completed a one-week Instrumentation Course for Mechanical Analysis at the University of Michigan. **Gary Gordon** also spent a week at the University of Michigan learning new ways to use the computer. **Brij Agrawal, Bill Sandrin** and **George Huson** were part of a team sent to Bangalore, India, to support the Indian Department of Space in negotiations for INSAT.

Paul Schrautz celebrated the return of his luggage 12 days after his return from Toulouse, France, where he witnessed the INTELSAT V Static Test. The Assembly Department's **Chuck Yost** has been granted a patent for a control system to prevent vehicles from driving away from fuel service areas without paying their bill. Chuck had filed for the patent prior to coming to work at the Labs.

Peter Poggi has a new house in Brunswick. **Pete Suthard,** now working at the Smithsonian, returned to attend our "Second Annual Basement Picnic." Former Labs employee **Marie Allnut** came by for a visit with her new son. **Chuck Harp** has departed COMSAT for Idaho where he is going into the trucking business. The **Pam Backelman** family has a new addition, a son **Ryan Douglas. Shirley Taylor** and her husband are building a solar house in West Virginia. A farewell party was held for **George Dill** who is leaving COMSAT after 14 years service. This was followed by a chicken picnic held later at the pond picnic area for those unable to attend the farewell party.

Recent vacationers were: **Gloria Moore** to Williamsburg and Pennsylvania; **Mary Duvall** to the shore; **Betsy Christie** at Ocean City; **Skip Stanton** in Los Angeles; and **Charlotte Scott** to Reading and Lancaster, Pennsylvania, then to Busch Gardens.

To receive service awards in October are: (10 years) **Don Rivera, Jeff Hyde, Forrest Bolinger, Helmo Raag, Paul Fleming, George Hewlin, Bill Windell, Bob Funkhouser, Paul Schrantz, Joe Jerome, John Reynolds** and **Shirley Taylor;** (five years) **Gundars Osvalds, John Bleisweis, Cris Inman, Vicke Harner, Ashok Kaul, Irwin Feigenbaum, David Weinreich, Bud Bell, Jay Cox, Annie Garza, Clarence Dorsey** and **Charlotte Scott.**

New Labs employees are **Keith Blickenstaff, Alan Stansbury, Olivia Pionteck** and **Richard Thorne.** Terminating employment with COMSAT were **Louis Mead, Leonard Booth** and **John Brandeo.** Summer Co-ops include **John Lyons** and **David McClelland.** Summer hires are **Mohammed Abutaleb, John Effland, David Ellner, Edith Fang, Gabor Lutor, Debbie Moore, Jeffrey Werth, Monica McRorie, Linda Chamblee, Nancy Rine, N. "Butch" Keel, William Harris, James McConeky, Kevin Axelson** and **John McCoskey.**

In sports, the Labs softball team ended its league play with a 10-8 record for third place in the upper Montgomery County Men's League. Playoffs were to begin in late July. **Joe Orzo, George Meadows** and **John Reisenweber** were the big hitters.

In tournament play the Labs team has played hard and well. In its first tournament of the year, played at Pine Cliff Park in Frederick, it came from behind a five-run deficit in the last inning to win 12-11. **Duane Johnson** drove a hard-liner to send in the winning run with no outs to defeat a strong Frederick Moose Team, The Frederick tournament was postponed because of rain but the Labs' team looks like a strong contender when it resumes.

In the first COMSAT Labs tournament, the Labs' team came in second to a very strong Virginia team. The Labs Eleven played a total of five games on a very hot Sunday afternoon, winning the first of a must-win-two series, but losing the second game against a well-rested super Virginia team.

In the Labs' second tournament, a one-pitch affair, the Labs placed fourth in an eleven-team go-around. **Ben Lewis** won the tournament going away. A special congratulation to **Joe Orzo** who left for California after leading the team in all categories throughout the year with 10 home runs, 40 RBIs and a .700 plus batting average.

Supporting the Labs Eleven during the season were **Andy Brunk, Bill Burch, Frank Cole, Bert Collins, Bob Cook, Jerry Creamer, Larry Fadeley, Josh Hampton, Harry Haigh, Duane Johnson, Buck Jones, Steve Kirsch, George Meadows, Terry Morgan, Jerry Maskel, Hank Mueller, Joe Orzo, John Reisenweber, Frank Scotto** and **Wayne Willie.**

The Labs intramural league was scheduled to start in mid-July with four teams battling for one thing or another through July and August—hot dogs, apple pies, Chevolets. . . .

The co-rec volleyball team in the county recreation league completed its season tied for second place. At the invitational tournament it finished third of five teams after a full day of 12 games. **—B.P.S.**

M&S CENTER. A surprise party was given recently in honor of **George Robertson**'s becoming an American citizen. Originally from Scotland, **George** became a citizen at a ceremony held at the Court House in

M&S staffers help George Robertson (center) celebrate his newly acquired citizenship.

Rockville with his wife **Ellen** and daughters **Kate** and **Jane** in attendance.

An Awards Ceremony was held at M&S with ten-year awards presented to **Charles Andersen** and **Jim Vienneau,** a five-year award to **George Hannah** and a one-year award to **Judy Ahalt.** A luncheon was held for **Ken Remington** prior to his departure for the Plaza where he joins the U.S. Systems Operations Plans and Regulatory Division.

Temporary hires include **Alice Walters,** a graduate of Damascus High School; **Beth Silvius,** a Western Maryland graduate; and **William Harris,** a VoTech student. **Jeff Sedgwick** has moved into his new condominium. The June Safety Award was given to **Bud Kennedy** for his suggestion of the month. Bud Kennedy's Little League team (seven to 11 years old) completed the 1978 season undefeated. It was a sight to behold—14 boys and coaches piled in the back of Bud's truck heading for the Frederick Mall and pizzas and cokes.

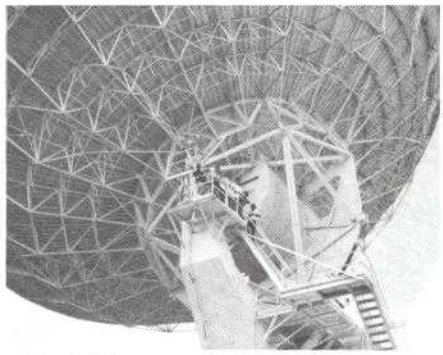
Vacationers so far this summer include: **Judy Ahalt** and her mother to Ocean City; the **Lee Bolingers** and **Charles Jenkins** spent time in Florida and visited Disney World; **Pierce Stine** went fishing and crabbing at Chincoteague, Virginia; **Floyd Thompson** returned from South Carolina complete with fish tales; **Jeff Sedgwick** spent 10 days scuba diving and photographing underwater species of fish and fossils in Bonaire, Netherlands Antilles; and your correspondent with daughter **Dianne** and three granddaughters motored to Iowa, highlighting the trip with the making of a five-generation picture. **—Darleen Jones**

PAUMALU. The annual PCEA Picnic was held in Haleiwa with more than 75 employees and their families attending, making this year's the best turnout ever for this event. Responsible for the successful outing were PCEA President **Tim Kolb,** assisted by **Cenon Usita, Don Stribling, Tom Kaneshira, Jack Vollrath** and **Rick Senones.**

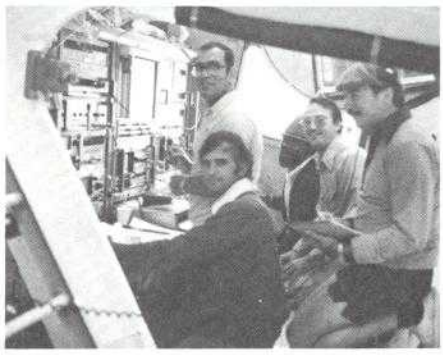
Eddie Clarke and wife **Rose** are celebrating the arrival of their fifth child (and fourth daughter) **Lisa Iwalani.**

At the home base for most of the In-Orbit Acceptance Test Teams since 1966, the Test Team conducted what will probably be the final test from the Paumalu 1 Antenna with the successful checkout of the COMSTAR D-3 spacecraft. The seven-member team led by Test Director **John Melville** exchanged final "Alohas" with our Paumalu staff and voiced regret that no further in-orbit spacecraft testing is expected to be conducted from Hawaii.

Our "Drum Room" has been a point of curiosity for many of the headquarters staff visiting Paumalu for the first time. Climbing the antenna to an area above the yoke they find a half-cylindrical room, eight feet in diameter and 16 feet long, with a rolling floor, accommodating three racks of test equipment, which remains level throughout the elevation travel from zero to 90 degrees.



Technicians are barely visible near the entrance to the Paumalu 1 Antenna "Drum Room."



Members of the In-Orbit Test Team shown inside the Drum Room, from left to right, Palo Alto's Harry Waight, the Labs' Ali Atia and Ignace Atohoun, the Plaza's Pat Rivalan and Test Director John Melville of Palo Alto.

However, free working space is rather limited as several test team members will attest remembering bruises sustained by failing to dodge the many antenna support braces in the room. —**Bob Kumasaka**

SOUTHBURY. MARISAT Operator **Cindy Bachyrycz** and Shift Team Leader **Roger Miner** have terminated their employment and are moving to the warmer climate of the Houston, Texas, area. **Larry Cohen,** Senior Technician, and **Sondra Borden,** MARISAT Operator, are new additions to our staff. **Hale Montgomery** and a camera crew visited the station to film a segment for the COMSAT corporate film and for a COMSAT GENERAL Marketing film on the Data Collection Platform Program. The modes of transportation for some of our employees have taken a turn toward the glamorous and sporty: **Dolores Raneri** in her new British (racing green) MGB convertible, **Bruno Sadys** in his new mahogany-red Corvette Sting-ray, and **Denis Bouchard** surprising everyone with his new (fire engine red) International Harvester Scout with diesel engine.

Jim Nelson's wife **Carol** is recuperating following her recent operation. Our vacationers included: **Alan** and **Barbara Coburn** touring New England; your correspondent visited the Bronx Zoo with some fourth-graders of Southbury Middle School; **Mike** and **Mona Masse** got in some camping and hiking in the White Mountains of New Hampshire and visited the Boston area; and **Rose** and **Rich Eureka** also visited Boston and hiked the Freedom Trail. **Dolores Raneri** has been doing very little for the "weight watchers" by keeping the station supplied with homemade preserves. —**Eileen Jacobsen**

PLAZA. We are pleased to announce that Mary Lane, Office of Satellite Orbital Control and Monitoring, will be the correspondent for the Plaza column in the NETWORK BITS. Mary has a Master's Degree in English from the University of Maryland. She is located in Room 4013, telephone extension 6329.

ADDENDA

Worth Noting

Charles Dorian of COMSAT GENERAL was elected a Vice Chairman of the Radio Technical Commission for Marine Services, RTCM, at its annual Assembly Meeting in Detroit.

Dr. Samuel J. Campanella, COMSAT Labs, was among the newly elected Fellows of the IEEE honored recently at its Awards Reception in Boston. Dr. Campanella was recognized "for contributions to signal processing and satellite communications."

Gert van Ommering of the Applied Sciences Laboratory received the COMSAT Labs Research Award for his contribution "in the research and engineering work . . . which led to the invention and development of the nickel-hydrogen battery."

Electroplaters tour Labs

Nearly 60 members of the American Electroplaters Society toured the Labs facilities recently during the Society's 65th Annual Technical Conference and Exhibit of Industrial Finishing in Washington.

Labs' Kreutel awarded PhD

Dr. Randall W. Kreutel, Jr., a Senior Scientist on the staff of the Assistant Director-Technical, COMSAT Labs, has been awarded the degree of Doctor of Science from the George Washington University in the field of electrophysics.

Prior to joining COMSAT in 1966, Dr. Kreutel had earned the BSEE and MSEE degrees from Northeastern University in Boston, Massachusetts. From 1968 to 1977 he was Antenna Department Manager at the Labs. He holds four U.S. patents and has authored some 30 technical papers.

COMSAT General's Linda Flack accident victim

Linda E. Flack, a secretary in the COMSAT GENERAL Switching Center, died on Sunday, July 2. Ms. Flack joined COMSAT GENERAL in January 1977. Services were held at the Calvary Protestant Episcopal Church with interment at Harmony Memorial Park in Landover, Maryland.

Carol Hyde wins COMSAT scholarship

Carol D. Hyde, daughter of Dr. Geoffrey Hyde, COMSAT Labs, was the winner of COMSAT's 1978 National Merit Scholarship Award. The award was presented to Miss Hyde by COMSAT President Joseph V. Charyk.

Miss Hyde, who graduated thirty-third in a class of 508 students from the Col. Zadok Magruder High School in Rockville, Maryland, accumulated a grade-point average of 3.65. She plans to enter the University of Pennsylvania and major in architecture.

Carol Hyde holds Scholarship Award presented by COMSAT President Joseph V. Charyk (left). Attending the presentation ceremony with her were her parents Dr. and Mrs. Geoffrey Hyde.

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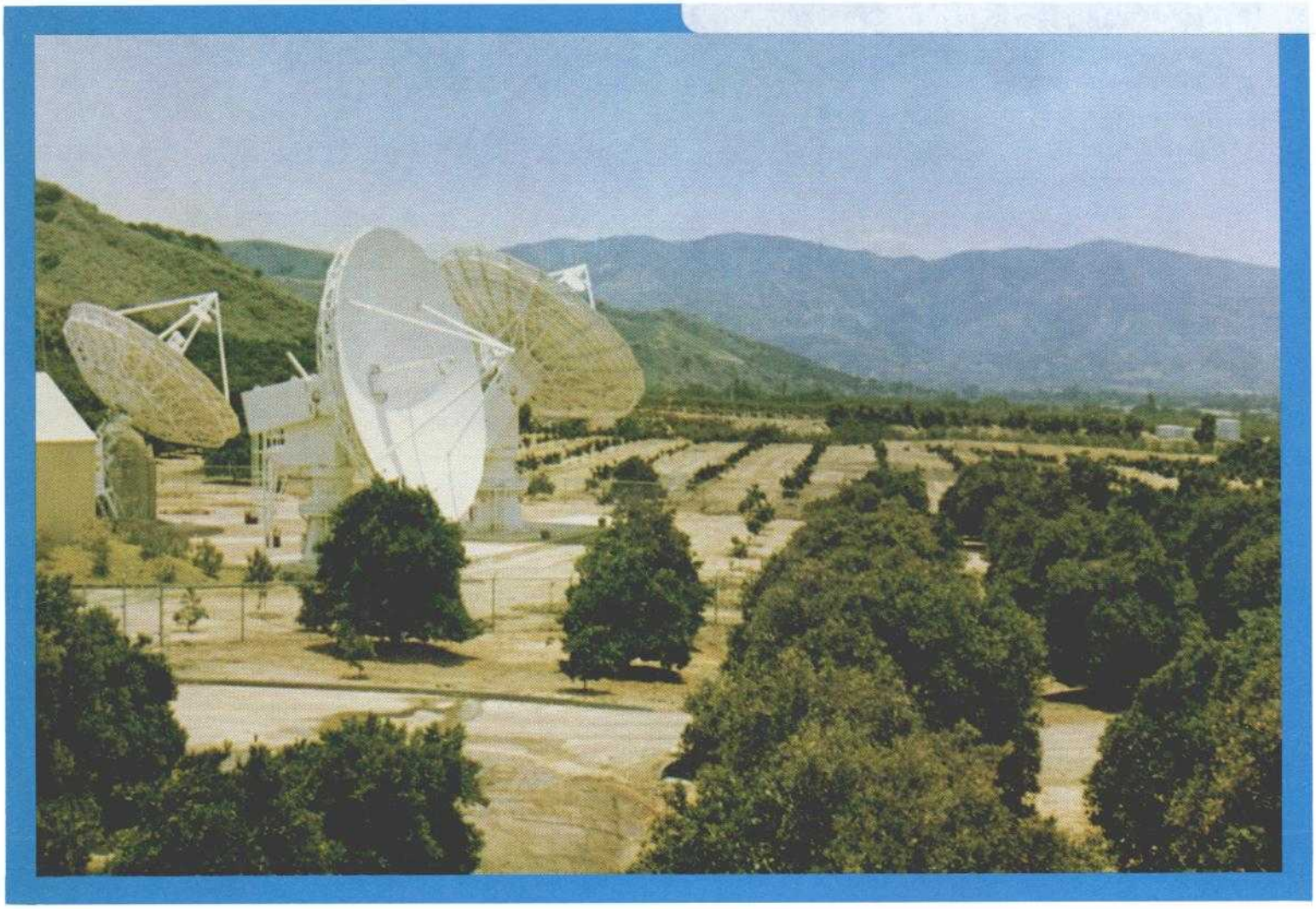

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Cover. *COMSAT General's Earth Station at Santa Paula, California*
PHOTO BY JOHN J. PETERSON

Early Santa Paula
(Courtesy of the Santa Paula Chamber of Commerce)

MARISAT's Pacific Command Post:

Santa Paula

Story and Photography
By John J. Peterson

The earliest known use of the name Santa Paula is found in the Mission San Buenaventura records of 1828 where it states that one of the three Mission reservoirs "is at the rancho which the Pagans (Indians) call Mupu, but which we call Santa Paula, six or seven leagues to the northeast."

According to historical documents, the city, in all probability, got its name from Saint Paula, a noble Roman matron, who became a disciple of Saint Jerome, and who, following the death of her husband, settled near Saint Jerome in Bethlehem and formed a community of religious women which helped him in his Biblical works until her death in the year 404. Saint Jerome, considered the most learned in the text of the Bible, returned to Bethlehem in 385 to carry on his great work of revising and re-translating the Latin Bible or Vulgate (Latin version of the Scriptures).

The City of Santa Paula is situated on a creek which bears the same name in the Santa Clara Valley of Ventura County, 14 miles inland from the County Seat of Ventura and the sea, and 65 miles northwest of Los Angeles.

Records also disclose that Santa Paula was not the first community established at or near its present site, that an earlier settlement known as Boulder (sometimes written Boulder-ville) had been located there or close by.

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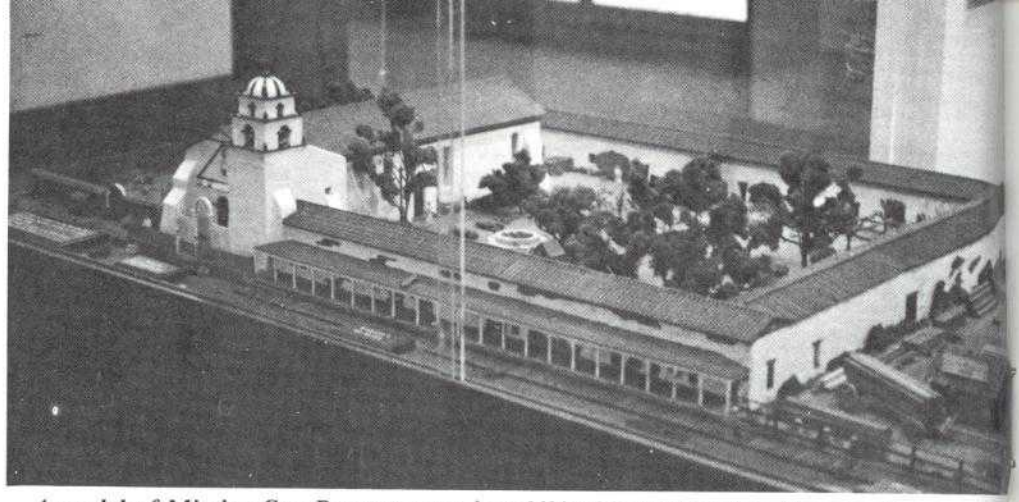
(Courtesy of the Santa Paula Chamber of Commerce)
Main Street Santa Paula in the early 1900s

Main Street today



A model of Mission San Buenaventura is exhibited in the Ventura County Historical Museum in Ventura.

Although there had been previous attempts to develop Santa Paula, none had been successful until the 1870s. In spite of a snowfall locally, drought in Southern California, the burst of the "Boom of the Seventies" in California and the Panic of 1873 nationally, Nathan W. Blanchard (usually considered the father of Santa Paula) platted in 1873, and registered on June 16, 1875, the Town of Santa Paula. Almost two years later, on June 14, 1877, a Post Office was established. On April 22, 1902, Santa Paula incorporated as a city.

Just as the Jamesburg Earth Station region in Upper California's Carmel Valley has its historical ties with the early Spanish missions of California and Mexico (PATHWAYS, November/December 1977), so has Santa Paula. Records show that the original land grant to Rancho Santa Paula y Saticoy was made by Spanish Governor Juan B. Alvarado on April 28, 1840, giving 17,733 acres to Manuel Jimeno Casarin.

And, just as the mark of Spanish exploration is embodied in the restored Carmel Mission within an hour's drive of Jamesburg (the ninth of the Spanish Missions founded in 1782 and the last by Father Junipero Serra), so too is Mission San Buenaventura a historic landmark in the City of Ventura, a short drive from Santa Paula.

Mission San Buenaventura (meaning "good fortune"), named after Saint Bonaventure, was to have been the third in the chain of 21 Spanish Missions to be built but, for one reason or another, the founding was postponed for 12 years. On Easter Sunday morning in the year 1782 the founding company celebrated mass, then set about building a chapel, a dwelling and a stockade.

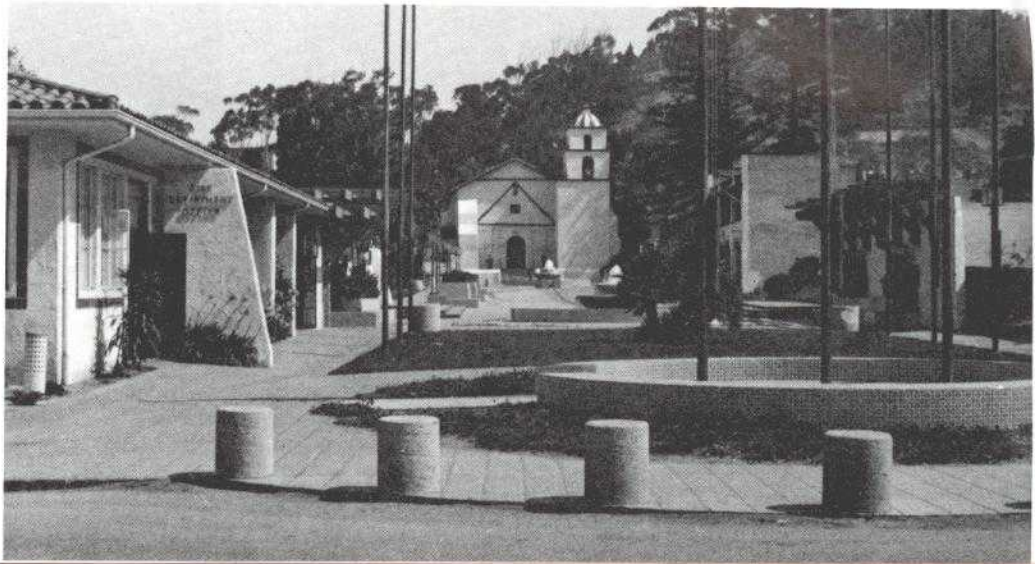
The Mission location was an Indian town of 500 souls, one of the many villages of the Chumash Indian tribes. In total, five Missions were founded in the Santa Barbara Channel territory of the Chumash by the Franciscans: San Luis Obispo (1772), San Buenaventura (1782), Santa Barbara (1786), La Purisima Concepcion (1787) and Santa Ines (1808).

Construction proceeded with the assistance of the local Indians who were happy to work in return for payment in beads and other trifles. Although curious about the settlers, they were not too quick to trade off their freedom for a restricted life behind mission walls.

It was an intelligent tribe with homes built igloo-style and sleeping on beds made of reeds rather than on the ground. The Chumash were noted for their construction of, and expertise with, large canoes in which they navigated the channel regardless of the weather. The culture of the Chumash was quite similar to that of the other Southern California Indians except for their highly specialized skill in fishing, symbolized in the plank canoe, the workmanship of which was considered remarkable, and which played a significant role in expanding their fishing range and stimulating population growth.

As an instrument of economic and territorial expansion it has been likened to the introduction of the horse among the Plains Indians (Landberg's *The Chumash Indians of Southern California*). Indeed the plank canoe, writes Landberg, used with relatively simple fishing implements in the rich fisheries of the channel, produced within the Santa Barbara Channel a very viable

The Figueroa Mall approach to Mission San Buenaventura. During the 1870s this was the center of the Chinese community.



economy centered around ocean fishing.

To the present day the secluded coves and everchanging shorelines of the Channel Islands continue to beckon with new fishing adventures and the offshore banks of Ventura are home to many varieties of salt water scrappers.

David Lavender, in his *California, Land of New Beginnings,* writes, "They (the Chumash) were superb craftsmen. With flint knives they carved beautifully finished bowls out of both wood and steatite, a soft soapstone. Their dome-shaped houses . . . were as much as 60 feet in diameter and sheltered three or four families each. They built seagoing canoes 30 or so feet long by splitting planks out of driftwood with wedges of whalebone, stitching the boards together with thongs of deer sinew, and daubing them with asphaltum from the numerous oil seeps in the vicinity. No other boats like them were made by Indians anywhere in North America. Almost as unique were the magnificent abstract paintings that the Chumash drew on certain rock walls in the nearby mountains."

Saticoy, a few miles south of Santa Paula, was the scene of prehistoric Chumash ceremonies and Indian assemblies held as late as the 1870s. There is the grim legend of annual human sacrifice associated with the springs there. According to legend, at the yearly Saticoy feast, cake was prepared by a priestess and served to each person. One cake, as everyone knew, contained poison, with quick death coming to the man, woman or child who chanced to be served the deadly portion.

From *The Story of Ventura County* published by the Title Insurance and Trust Company the following is excerpted.

There was the Indian period when channel waters were lively with the canoes of Chumash fishermen. There was the discovery period when Spanish visitors, beginning with Cabrillo, came ashore or crossed Ventura soil (Juan Rodriguez Cabrillo commanded the Spanish expedition exploring the California coastline in 1542). There was the mission period, the rancho period, and the brief war period. The Americans came, they subdivided the ranchos, farmed the fertile land, raising amazing crops, and started towns. Instead of a gold rush the county had an oil rush. Geographically, Ventura County is blessed with seashore, valley and mountain areas.

The Mission here was named for San Buenaventura (Saint Bonaventure), an Italian theologian who had become a Franciscan and was known as the Seraphic Doctor. He was a renowned philosopher and one of the greatest scholastics of the Middle Ages. On September 15, 1768, Father Serra was directed to name a mission in honor of San Buenaventura. The community that slowly developed beside the church began to be called The Mission of San Buenaventura but was soon shortened to The Mission.

In 1862 a post office was opened and the community incorporated as a city March 20, 1866, each named San Buenaventura from the Mission. The trend toward change began with the name being written as three words, San Buena Ventura, soon abbreviated to S. B. Ventura. A petition to the Legislature in 1869 requesting the formation of a new county, gave

(Continued on next page)

Construction on the Santa Paula site was begun in April 1974 with initial personnel to man the station arriving in the summer and fall of 1974 and preliminary acceptance testing completed in July 1975.

Santa Paula provided support for the first MARISAT satellite launch (stationed over the Atlantic Ocean) which took place February 19, 1976.

The station participated in the launch, in-orbit testing and routine TT&C functions related to the COMSTAR 1. Launched on May 13, the satellite arrived on station June 3 and was turned over to AT&T June 5.

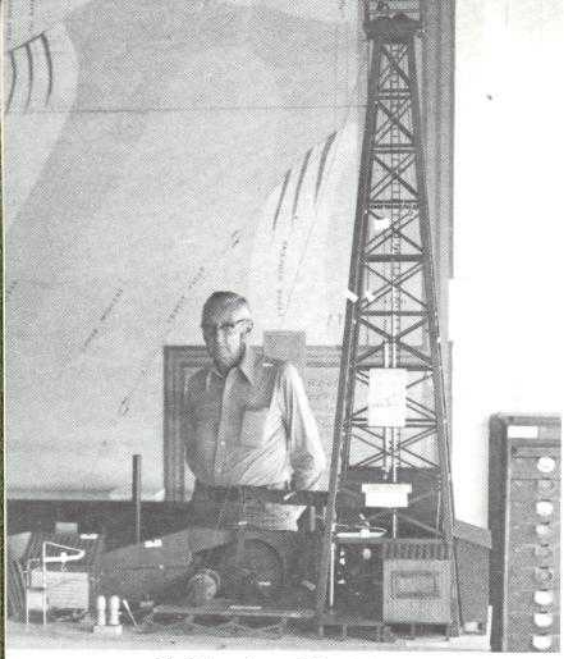
The second MARISAT launch (Pacific Ocean Region) took place on June 9, 1976, with station personnel participating in the launch and in-orbit testing. Commercial communications service was initiated August 15, 1976. Santa Paula has responsibility for TT&C as well as being the only communications shore station servicing the satellite.

Station Manager Dan Geer

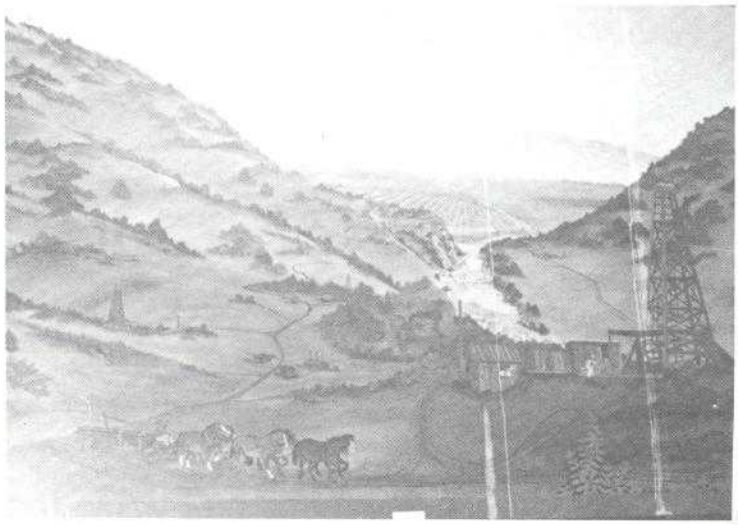
On July 23, 1976, the second COMSTAR satellite was launched, to be followed by the COMSTAR D-3 launched June 29, 1978. Santa Paula shares TT&C responsibility with its sister station at Southbury, Connecticut.

The third MARISAT satellite was launched for Indian Ocean Service on October 14, 1976. As with the previously launched MARISAT and COMSTAR satellites, the station participated in its launch and testing.

With the growth in MARISAT voice traffic, a second voice channel was added in May 1978 to meet the requirements for expanded service.



California Oil Museum Curator Ben Potts with a model of an early oil rig in the Santa Paula Museum.



This painting of an early oil field in the Santa Paula area hangs in the Union Oil Company's Museum in Santa Paula. The Museum attracts an average of 25,000 visitors annually.

OIL

Ventura as its proposed name. The first newspaper published here was the Ventura Signal in 1871. With the entrance of the Southern Pacific Railroad to San Buenaventura in 1887, "Ventura" was substituted for the longer name for convenience in printing timetables. The name of the post office was changed to Ventura in 1889.

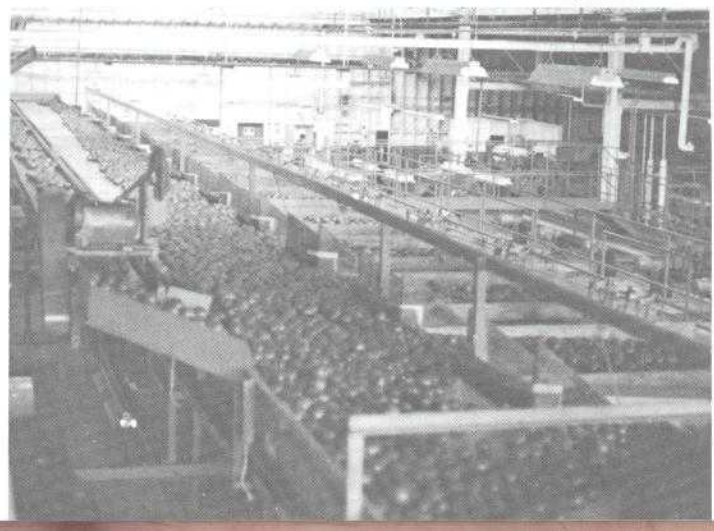
The official name of the community has remained San Buenaventura although it is normally called Ventura. If a time is to be set when the town's name should be considered to have changed from San Buenaventura to Ventura, it would have to be 1889, when the post office accepted the name Ventura. This was the name by which the town had been known by most of its residents and it was the name by which the outside world would address mail to the town.

Before the padres had come, the Spanish explorers seem to have given names to fit the whim of the moment. When Cabrillo discovered this location he named it La Pueblo de los Canoas (The Town of the Canoes) because of the large boats or canoes of the Indians. In 1769 wrote Miguel Constanso, with the Portola expedition, "We thought that this was the town which the first Spanish navigators—among others, Cabrillo—named Pueblo de Canoas. We gave it the name of La Asuncion de Nuestra Senora (The Assumption of the Blessed Virgin) or La Asumpta, because we reached it on the eve of the festival."

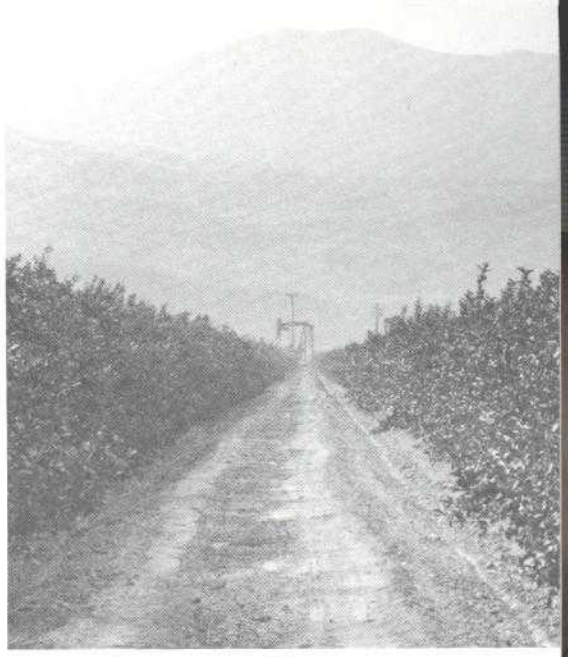
A walking tour of Ventura reveals much of early California life: Mission San Buenaventura, the last of the 21 missions in Alta California founded by Father Serra before his death; archaeological diggings uncovering evidence of aboriginal occupation 3,500 years ago; "El Caballo," a water infiltration building built in the 1790s as part of the Mission water system; the Ortega Adobe built in 1857 with the surviving half recently restored authentically; China Town, the center of the Chinese community during the 1870s; the Mission Plaza Fig Tree believed to have been planted in 1873 and having an 18-foot trunk circumference and a branch spread of 100 feet; the Rancheria of Shisholops and Cabrillo's Landing, the site of one of the largest of the Chumash villages along the

A view from a Santa Paula hillside lends credence to the city's claim of being the "Citrus Capital of the World."

A seemingly endless supply of lemons is carried by conveyors into Saticoy Lemon Association Plant #3 in Santa Paula. According to House Superin-



Santa Paula Station's Gordon Johnson at edge of natural oil seepage on Sulphur Mountain a short distance from the station.



A typical countryside scene near Santa Paula reflecting the county's main sources of income, citrus and oil.

coast, settled in 1000 A.D. and at which point Cabrillo probably landed in 1542; and numerous other attractions such as the wharf, hitching post, the Serra statue and the San Miguel Chapel site.

An annual event is the Butterfly "Blizzard" in October and November when thousands of migrant Monarch butterflies dip and dart about the city. Usually about February they will disappear after repeated reproductive processes which increase the Monarch population into the hundreds of thousands. The mystery of the Monarchs is in their origin and summer residence, neither of which has been found, although it is generally believed that unpopulated sections of western Canada may be their habitat.

From the Channel Islands National Monument Headquarters at Ventura Marina, the two channel islands, Anacapa and Santa Barbara, which make up the national monument, can be reached by excursion boats operating on seasonal schedules. Isolated for millions of years, and still unspoiled by man, the channel islands offer the sights and sounds of the bull elephant seal, the blue heron, leaping porpoise, colonies of sea lions and migratory gray whales.

Anacapa Island was included as part of Ventura County when it was created out of the southeasterly portion of Santa Barbara County on January 1, 1873. The outermost of the Channel Islands, San Nicholas, 53 miles from the nearest mainland but not a part of the National Monument, also lies within county jurisdiction. Anacapa Island is the closest island to the mainland. In reality, it is a chain of three separate islets almost five miles in length and about 700 acres in area. It lies 15 miles off the coast.

The Island is uninhabited (although used by Chumash fishermen and later was a sheep ranch). Waterless and riddled with caves, since 1931 Anacapa has been one of the five great radio beacon stations on the coast of Southern California operating a synchronized radio system to warn and guide ships. The story is

(Continued on next page)

CITRUS

tendent Charles Ramirez, the SUNKIST-affiliated plant handles about two-million boxes a year, shipping them to domestic and foreign markets. In the bottom photos the lemons are sorted electronically (left) then by hand and packed (right) during the processing.

San Buenaventura City Hall, originally the Ventura County Courthouse, now serves as the center of government for both the City and County of Ventura.

Thousands of visitors annually view the exhibits in the Seabee Museum at Port Hueneme approximately 20 miles southwest of Santa Paula.

told that it was Anacapa that cost young James Whistler his job—Whistler who would later become the world-renowned painter. Commissioned by the Coast and Geodetic Survey to draw a map of the island, he enlivened his artistry with an imaginary flock of gulls and was promptly fired.

Wind-swept San Nicholas was long inhabited by the Indians but Aleut and Russian hunters of sea otters took so heavy a toll of them that, in 1835, the Mexican Government removed the handful of survivors, apparently to Mission Santa Barbara. Today San Nicholas is used for monitoring guided missiles tested at the Navy's Point Mugu Pacific Missile Test Center.

Taking Route 126 from Ventura to Santa Paula and into the Santa Clara Valley flanked by mountainside groves of lemons and oranges, it is readily understandable how the city became known as the "Citrus Capital of the World." Atop mountain ridges, along the banks of the Santa Clara River and jutting up from the citrus fields, oil derricks blend into the scenery, a reminder of the important role Santa Paula played in the birth of the state's oil industry, while, close to the river bed, acres of flowers being raised for seed add color to the scene.

But the countryside has not always presented this picture of beauty and serenity. There was the time, not too many years in the past, when death and destruction hurtled through the Santa Clara Valley to the sea, not sparing Santa Paula on its way.

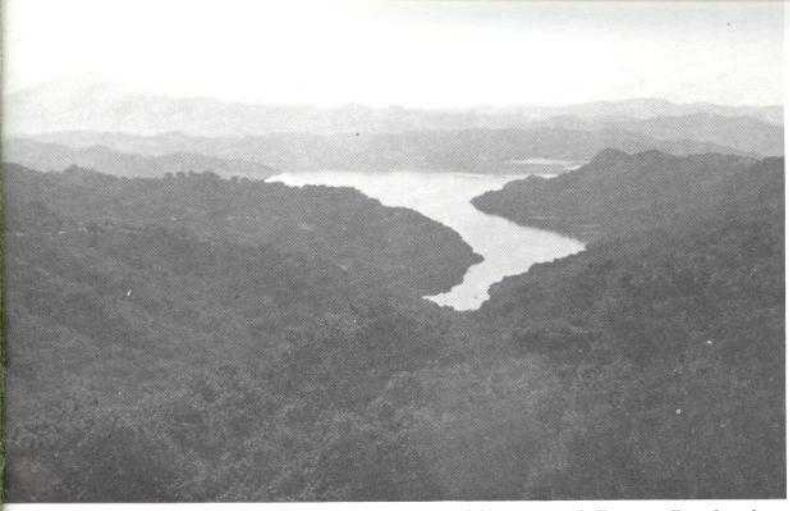
For the residents of Santa Paula the alarm of impending disaster first reached them in the early morning hours of March 13, 1928. The Saint Francis Dam on the Los Angeles Aqueduct in San Francisquito Canyon, approximately 50 miles northeast of Santa Paula, had collapsed and released a tremendous wall of water that was sweeping down the Santa Clara Valley.

The dam, 600 feet long, 180 feet high and holding 38,000 acre-feet of water, had given way just before midnight on March 12, releasing a 130-foot wall of water which for some distance below the dam was at least 60 feet high and the crest of which would be estimated at 25 feet above the normal stream level when it reached Santa Paula.

It took the floodwaters a little more than three hours to reach Santa Paula and a total of almost five-and-one-half hours to reach the sea carrying before it a terrific mass of debris—trees, telegraph poles, railway tracks, bridges, fences, buildings—everything movable that lay in its path. Death

Numerous Victorian and pre-Victorian homes are found in Santa Paula. Among them is the Faulkner Home, whose cornerstone was laid in 1894.

A citizens' group preserves Santa Paula's 91-year-old railroad station which received its first passenger in August 1887. It has been designated a Heritage Landmark.



Lake Casitas, on Highway 33 west of Santa Paula, is a veritable sportsman's paradise with boating and fishing available year 'round.

Five miles east of Santa Paula is "The Little Red Schoolhouse." Built in 1896, it is the only survivor of Ventura County's one-room schoolhouses and is still in use.

statistics compiled reported loss of life in the Santa Clara Valley at 385 persons: 224 identified dead, 60 unidentified dead and 101 missing, with 231 of the dead found in Ventura County, according to the County Coroner's report—which, incidentally, placed the loss of life at 420. The Santa Paula Chronicle, dated May 12, 1928, reported that 74 bodies were found in the Santa Paula area following the flood. In addition to the loss of life, more than 1,200 homes were destroyed and almost 8,000 acres of land flooded with considerable damage to fields and orchards.

A few miles west of Santa Paula, Ojai, Ventura County's fourth largest town, lies in a breathtakingly beautiful valley encircled by mountains. Writers speculate that perhaps its moon-shape resulted in its name—Chumas for "moon" although sometimes interpreted as "The Nest." It can be approached from the Santa Paula road or from the Ventura River Valley. But the setting was not always so tranquil and stories are told of valley settler John T. Snow who, during the winter of 1864, killed a dozen or more grizzlies there and saw at least 100.

Leaving Ojai and climbing Dennison Grade, where an overlook provides a view of the entire Ojai Valley, the next historic point is the site of the famous "Ojai No. 6" oil well, the first California oil well to yield extended commercial production. It was the first to be drilled with steam power, the first to flow without help from a pump and was drilled to a record depth of 550 feet (another source states 700 feet). This first recorded "gusher" produced oil from 1867 until 1902.

Today, oil is one of the County's biggest sources of income. But oil, in one form or another, has been associated with the development of this region of California for centuries. County history tells of oil seepages on the north side of Sulphur Mountain, northeast of Santa Paula, reportedly the largest in California. Here heavy oil, accompanied by sulphurous water, flows down the side of the mountain from outcrops of Miocene shale.

This oil was used in the Mission period for roofing houses. The Indians used it to haft their arrows, waterproof their baskets and calk their canoes. In the early 1860s several tunnels were driven into the steep slopes of Sulphur Mountain, penetrating oil sands below the surface. This marked the first successful "oil mining" in the western hemisphere. It is estimated that more than 30 tunnels, with a combined length of

(Concluded on page 14)

The Santa Paula Airport is the center of antique airplane activity. Located in one of the hangars was this "oldtimer" used by the McDonald Restaurant chain in its TV commercials.

The one-hundred-year-old Moreton Bay Fig Tree dominates U.S. Route 150 as the highway approaches the downtown business area of Santa Paula from the earth station site.

INTELSAT Board approves technical services contracts with COMSAT

The Thirty-fourth meeting of the INTELSAT Board of Governors was held in September, 1978. Among its key actions the Board:

Administrative and Organizational Matters

• Authorized the Director General to execute the two technical services contracts with COMSAT, for periods of six and four years, respectively, commencing January 1, 1979, containing a fixed fee to be determined on the basis of 11 percent of the total estimated cost for each task of the contracts; to terminate the existing Management Services Contract on December 31, 1978; and to negotiate with COMSAT, on a sole source basis, laboratory services support relating to those elements in the statement of work which satisfy the criteria for sole source procurement. Other tasks in the statement of work which do not meet the sole source criteria will be subject to competitive procurement.

• Approved implementation of an INTELSAT assistance and development program, and creation of new posts for this program, with consequent budget adjustments.

Technical and Operational Matters

• Authorized effort to continue on the maritime communications subsystem (MCS) in the period October 1-December 31, 1978, at a cost of $1.23 million; requested the Director General to further develop the MCS specifications and to forward them to the Advisory Committee on Technical Matters for review at its next meeting; authorized the Director General to initiate the relevant IFRB process leading to registration of maritime capability on board INTELSAT V satellites for the 60°E, 63°E, 341.5°E and 330.5°E orbital locations; and authorized the Director General to exchange information with the international Joint Venture, the INMARSAT Preparatory Committee and other appropriate entities.

• Approved contracts with the U.S. Signatory for provision of TTC&M services at Andover and Paumalu from January through December 1979.

• Authorized the Director General to negotiate with the French PTT for provision of a 14/11 GHz Communications System Monitoring (CSM) facility at Berceney-en-Othe; to exercise the contract option with Telespazio for provision of a 6-meter antenna, 14/11 GHz in-orbit test facility at Fucino; and to investigate the usefulness, feasibility and cost of providing an additional 6/4 GHz CSM facility for the Atlantic and Indian Ocean Regions.

• Approved award of a contract to EMBRATEL (Brazil) for TTC&M services in the Southwest Atlantic during the 1980-1984 period.

• Took no decision on launch vehicles for INTELSAT V(F-5)-(F-7).

• Decided not to exercise the option expiring on September 20, 1978, for additional INTELSAT V spacecraft.

• Authorized a $200,000 design study of a nickel-hydrogen battery program for later INTELSAT V satellites.

• Authorized the Director General to relocate the INTELSAT IV (F-1) to 342°E to serve as the Atlantic Major Path 2 satellite; the IV (F-3) to 339°E and the IV (F-5) to 57°E to serve as spares; and requested him to keep the operation situation under close review, particularly in the Pacific, and report if changes to satellite lifetime predictions necessitate corrective action.

• Expressed the finding pursuant to Article XIV(c) of the Agreement that the USASAT 6A and B (SBS) networks are technically compatible with the existing and planned INTELSAT space segment.

• Expressed the finding pursuant to Artiicle XIV(c) that the SATCOL (Colombia) domestic system is technically compatible with INTELSAT; this is provisional until the Advisory Committee on Technical Matters has reviewed the technical coordination results.

• Tendered advice to the Assembly of Parties pursuant to Article XIV(d) of the Agreement that Japanese use of MARISAT satellites in the Pacific and Indian Ocean Regions is technically compatible with INTELSAT and will not cause significant economic harm through 1981;

• Tendered advice to the Assembly of Parties pursuant to Article XIV(e) that operation of meteorological services of the Indian INSAT domestic satellite network is technically compatible with use of the radio frequency spectrum and orbital space by the existing and planned INTELSAT networks.

• Noted reports on technical and economic coordination of the ECS system pursuant to Article XIV(d) and invited the Signatories concerned to provide the information called for in INTELSAT's economic coordination procedure.

• Authorized the Director General to continue to explore the alternative means by which INTELSAT can provide space segment capacity for television services between Mexico and a number of points within the United States, including the lease by INTELSAT of a transponder in a U.S. domestic satellite system.

• Approved: India's applications for seven stations to access India's

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COMSAT participates in UN meeting experiment between New York and Buenos Aires via CTS satellite

A satellite 22,300 miles in space and small portable earth terminals were used to relay simultaneous language interpretations for a United Nations meeting recently in Buenos Aires, Argentina, in an experiment to demonstrate and evaluate remote translation and interpretation.

In the experiment, speeches and documents presented during certain sessions of the U.N. Conference on Technical Cooperation Among Developing Countries from August 30 to September 12, 1978, were relayed via satellite to U.N. Headquarters in New York. The U.N. interpreters in New York translated the documents for return the next day, but provided simultaneous interpretation of the plenary session of the conference.

The United Nations, with the cooperation of the United States National Aeronautics and Space Administration (NASA), COMSAT and ENTEL of Argentina, conducted the experiment to demonstrate and evaluate the feasibility of remote simultaneous interpretation of a conference and the transmission by facsimile of documents for remote translation . . . via satellite.

To carry out the experiment COMSAT Laboratories installed a transportable earth terminal with a two-meter diameter antenna on the roof of the 12-story conference building in Buenos Aires. The COMSAT terminal was connected via the Communications Technology Satellite (CTS) to an earth terminal at the U.N. Building in New York. The New York earth terminal is owned and operated by NASA and consists of a bus containing all of the required electronics and a roof-mounted 2.4-meter antenna.

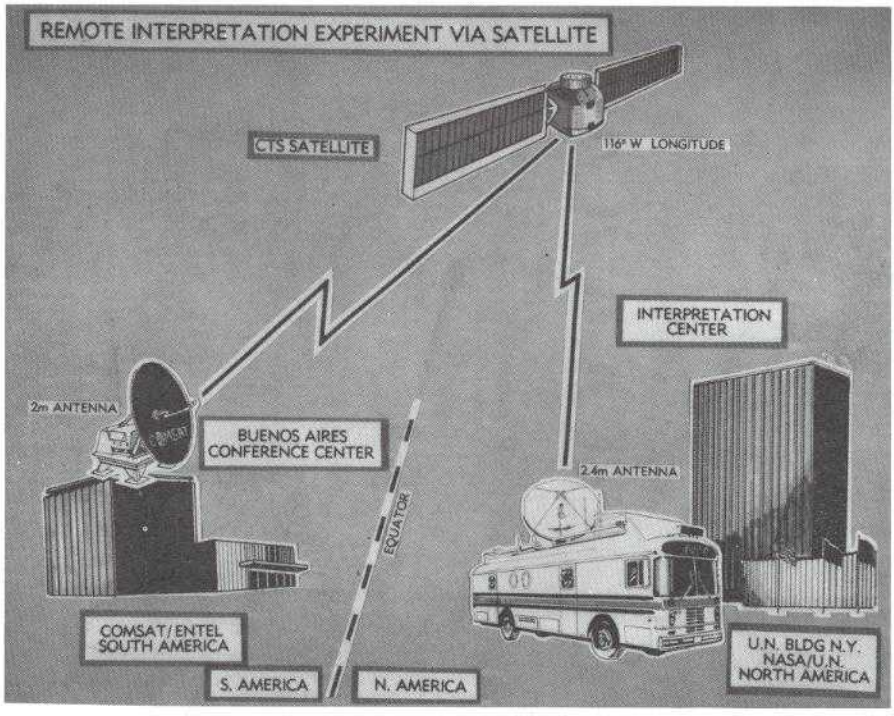
The communications links established between the COMSAT earth terminal in Buenos Aires and the NASA earth terminal in New York included one color television channel each way, and a high fidelity program audio channel and eight voice-grade channels in both directions.

During the experiment the voice and a television picture of the speaker in the conference in Buenos Aires were sent via CTS to New York. The simultaneous interpretations in five official U.N. languages were returned to Buenos Aires via satellite for transmission to the audio headsets of the delegates attending the conference. Each delegate selected the language of his choice. Two-way television was used at the end of the experiment to evaluate the results of the interpretation/translation experiment.

Facsimile copies of selected documents presented in Buenos Aires also were transmitted at high speed via satellite to New York for translation. Translated versions were returned the next day to Buenos Aires. For the experiment, Rapicom, Inc., provided Rapifax 100 facsimile equipment in Buenos Aires and New York.

The satellite used in the experiment is owned jointly by Canada and the United States, and satellite time was shared equally between U.S. and Canadian experimenters. The Government of Canada made available some of its time on the satellite for the experiment.

CTS is a powerful communications satellite which can simultaneously transmit and receive color television, voice and data in both directions, between two earth terminals. The earth terminals operating with CTS transmit at a frequency of 14 GHz and receive at 12 GHz.



Thousands see COMSAT exhibits in Maine and California

COMSAT recently participated in the National Association for the Advancement of Colored People (NAACP) Commerce and Industry Show in Portland, Oregon, and the National Urban League's Sixty-Eighth Annual Conference held in Los Angeles, California.

According to Personnel's W. B. Lockett, thousands of visitors viewed the COMSAT exhibit. COMSAT was one of the more than 200 exhibitors attending both conventions with exhibits provided by business organizations and government agencies such as Atlantic Richfield, AT&T, ITT, the Central Intelligence Agency, CBS, Ford Motor Company, IBM, NASA, RCA, the Department of Justice and Xerox Corporation and others.

Assisting at the exhibit in addition to Lockett were Personnel's Glenda Cooper and Public Information's Michael Glasby in Portland, and Personnel's Mel Williams, COMSAT GENERAL's Brenda Lawson and Information's Glasby in Los Angeles.

The accompanying photographs show exhibits provided by COMSAT at the NAACP Commerce and Industry Show in Portland, Oregon, and the National Urban League Conference in Los Angeles.

Indian Ocean countries switch over to new, larger-capacity satellite

Satellite communications earth stations in countries around the Indian Ocean area began a complex operation recently to switch over to a new, larger-capacity INTELSAT communications satellite.

The new INTELSAT IV-A satellite, with a total of about 6,000 two-way telephone circuits, will have 25 percent more capacity for everyday communications than its INTELSAT IV predecessor. Eventually, it will also provide increased capacity for international satellite television. The Indian Ocean INTELSAT satellite provides communications for and between countries in an area bounded approximately by Britain and Europe in the west and Japan and Australia in the east.

Forty-seven earth stations are involved in the transition operation. It is expected that the transition will be substantially completed by the end of 1978. During the transition period, the stations in the system will go through about 150 major operational steps, each comprising a large number of substeps. The complex sequence, planned and supervised by INTELSAT Headquarters in Washington, D.C., is being directed through the INTELSAT Operations and Technical Control unit at the British Post Office's Goonhilly earth station complex in southern England.

No interruption or disruption of telecommunications services is expected during the changeover, except that television transmission facilities will not be available during the latter half of November. However, when the transition is completed, instead of having only one television channel available in the Indian Ocean, as is the present case, there will be two.

The television shut-down period, necessary to provide sufficient capacity to ensure continuity of other public telecommunications services during the critical stage of the changeover, was chosen to coincide with a time of traditionally low demand for television. Wherever possible, INTELSAT will, however, provide alternate means for television service, using its resources of satellite capacity in other regions for roundabout routing. It is expected that all but a few of the normally scheduled television services could be handled this way. All other communications services will continue to operate normally. This will be achieved by using, for the first time in the INTELSAT system, a new changeover technique.

Up until now, when changing from one satellite to another, each earth station has had to turn its transmission beam off the first satellite, then traverse its dish antenna across to focus on the new spacecraft, usually positioned about three degrees away on the stationary equatorial orbit, 35,900 km out in space. While traversing and realigning, of course, no communications are possible. However, during the current operation, both the old INTELSAT IV and the new INTELSAT IV-A will be carefully positioned in orbit at the same location, and their harmonic motion (a "sway" induced by natural forces acting on the spacecraft) will be synchronized. With the satellites in such close proximity, it would be possible for earth stations to "see" both of them simultaneously; this technique makes it possible to carry out changes in the operational configuration without a break in service.

The new operational satellite, the INTELSAT IV-A (F-6), was launched from Cape Canaveral on March 31 this year. The last of the INTELSAT IV-A series to be placed in orbit, F-6 has since been undergoing a series of tests. The extra capacity of the IV-A is expected to cope with demand for communications services in the region until early 1981, when it is scheduled to be replaced by an INTELSAT V satellite. The INTELSAT V series satellites, currently being developed and manufactured, will each have a capacity of 12,000 two-way telephone circuits and two television channels.

EBU requests COMSAT to provide TV service for 1980 Winter Olympics

COMSAT has signed an agreement with the European Broadcasting Union (EBU) to provide direct satellite services to the EBU for European television coverage of the 1980 Winter Olympic Games in Lake Placid, New York.

EBU requested COMSAT to provide the direct service after EBU determined that direct service would provide significant operational and technical advantages over the traditional means of providing the service via landlines to one of the COMSAT-operated permanent earth stations operating with the INTELSAT global satellite system.

Under the agreement, COMSAT will install and operate an earth station near Lake Placid. EBU's television signals will be sent through the COMSAT earth station directly to an INTELSAT satellite over the Atlantic Ocean for reception at European earth stations designated by the EBU.

The agreement is subject to timely approval by the Federal Communications Commission (FCC) of COMSAT's request for authority to provide the service to the EBU. As part of the request, the Commission has been asked to authorize construction of the earth station at Lake Placid and to designate the EBU as an "authorized user" of COMSAT's services.

The European Broadcasting Union, based in Geneva, Switzerland, is a non-governmental association of broadcasting companies.

Skinner elected COMSAT Comptroller; Shubilla becomes Treasurer

George L. Skinner

George L. Skinner, Director of Accounting for COMSAT since 1971, has been elected Comptroller reporting to Carl J. Reber, Vice President for Financial Matters.

Mr. Skinner, who joined COMSAT in 1966 as Budget Manager, is a graduate of Southeastern University with a Bachelor of Business Administration Degree.

Stanley L. Shubilla, formerly Assistant to the Vice President, Finance and Administration, COMSAT GENERAL, has been elected Treasurer reporting to Carl J. Reber, Vice President for Financial Matters.

Mr. Shubilla joined COMSAT in 1967 as a financial analyst and was named Manager of Financial Analysis in 1969. He has been with COMSAT GENERAL since 1973. He has a Bachelor of Science Degree in Accounting from King's College.

Stanley L. Shubilla

INTELSAT
(Continued from page 8)

leased transponder; the Australian experimental station for access free of charge for experiments and demonstrations through November, 1978, on TV program distribution with an INTELSAT spot beam; a station in Norway for access to Norway's leased transponder; four stations in Peru for access to their domestic transponder; and an experimental UK station at Hong Kong for access free of charge for one year to conduct rain depolarization measurements. The Board also extended approval of the non-standard Liberian station from end-1978 through October 1979.

• Approved and authorized the Director General to execute agreements for the preemptible allotment of one-quarter transponder to Peru and three-quarter transponder to Oman to meet their respective domestic telecommunications required; approved in principle the preemptible allotment to Brazil of one-half of an INTELSAT IV-A hemispheric beam transponder.

Financial and Legal Matters

• Requested the Director General to continue the study of INTELSAT provision of space segment capacity for long term allotments and authorized the Director General to survey Signatories and users regarding the requirements for leased capacity.

• Decided that the rate for INTELSAT IV-A hemispheric beam transponders will be 1.2 times that for global beams.

• Authorized the Director General to advise Australia that the charge for preemptible lease of an INTELSAT IV spot beam transponder would be twice that for a global beam.

• Reaffirmed its earlier decision that the royalty payment for use of INTELSAT's celestial mechanics computer software programs for non-INTELSAT launches would be $40,000 per launch; and decided that under provisions of the existing general computer software licensing policy the maximum royalty payments to be incurred by any one Signatory for use of this software shall not exceed $240,000. It further agreed that pursuant to the above decisions the U.S. Signatory shall be deemed to have a fully paid-up non-exclusive nontransferable license, without the right to grant sublicenses, for the use of this software.

• Approved an outline for the INTELSAT Accounting Procedures and Internal Control Manual; format for elements of the 1979 INTELSAT budget; and adoption of a task analysis budget system for the Executive Organ. It requested the Director General to report annually on performance of the INTELSAT staff retirement plan fund.

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

United Way Chairman Richard S. Bodman (center) with Co-Chairman June Burton (left) and PIO's Joycie Stroud.

Headquarters employees attend United Way party.

Giving the United Way

Fund-raising parties were held at the Plaza and Labs recently in support of COMSAT's United Fund Campaign. Refreshments were served and door prizes numbering almost 60 were awarded. Entertainment was furnished at the Plaza party by the Music Appreciation Club and, at the Labs, by Rolan Clark and Page Heston.

The United Way Fund is supported annually by COMSAT with COMSAT adding an additional one dollar for every two pledged by employees in excess of the previous year's total. Richard S. Bodman, Senior Vice President, Finance and Corporate Development, is Chairman of the fund drive, and June Burton of Finance, Co-Chairman.

The Music Appreciation Club's Les Cameron (left) and Ronald Worthy.

Door prizes are awarded at the Labs party.

Rolan Clark (left) and Page Heston furnished music at the Labs.

United Way party at the Labs.

The Music Appreciation Club Chorus at the Plaza United Way party.

SANTA PAULA

(Concluded from page 7)

two-and-one-half miles, were driven into the mountain.

All of the work was done by hand and the tunnels were aligned and lighted by the use of mirrors and reflected sunlight. Cave-ins and petroleum gases caused the deaths of several workers. Individual tunnels generally were less than 1,000 feet long and a foot-board and track ran the entire length. There was also a gutter on the floor in which the oil and water flowed down into a separating tank. It is reported that one of these oil tunnels yielded 900 barrels of oil per month when it was completed in 1889.

Relatively short detours from Ojai reveal much of the scenic beauty for which Ventura County is noted, such as beautiful Lake Casitas with its year-round boating and fishing. Driving northeast to Fillmore is to pass through magnificent acreage of citrus and avocado plantings and to see the fat black forms of Aberdeen Angus cattle ceaselessly munching the grass.

Looming high over Fillmore and adjoining Piru are the mountains of Los Padres National Forest containing the Sespe Wildlife Area, a 53,000-acre breeding sanctuary set aside for the famous giant California Condors. In the rocky caves along the rugged cliffs, this breed of birds roosts and breeds. Master of flight and largest of all North American land birds, they are reminiscent of prehistoric birds with a wingspread of over nine feet and a weight of more than 20 pounds, capable of soaring at speeds of 30 to 40 miles per hour. Even though the species is protected by law in California, loss of Condors through illegal and mistaken shootings have reduced the number remaining to less than 100.

Dropping down from Fillmore and heading back toward the coast one arrives at Camarillo, a town surrounded by orchards of apricots, walnuts and lemons, and the center of lima bean production. The town took its name from its founder, Juan Camarillo, who came to California in 1834 with the Hijar-Padres colony, became a trader in Santa Barbara, moved to San Buenaventura in 1859 where he bought Rancho Calleguas on which the City of Camarillo is now situated. The Library of St. John's Seminary contains treasures among which are illuminated manuscripts, incunabula, Bibles, first editions of famous books, Americana, and items from noted presses, all in superb condition.

Oxnard, the County's largest city, is but a few miles south along the coast from Ventura toward Los Angeles. Once referred to as the "Sugar Beet City," it is now the hub of a diverse and richly productive agricultural area producing sugar beets, lima beans, lemons, walnuts, avocados, strawberries and all types of vegetables.

Ventura County has also played an important role in the Country's national defense. Along the coast, not far from Santa Paula, are the Navy's Pacific Missile Test Center at Point Mugu where the testing and evaluation of guided missiles is carried out, and the Naval Construction Battalion Center at Port Hueneme, the "home of the Seabees," at which more than 10,000 Seabees were trained during World War II and through which a major portion of supplies were shipped to the Armed Forces in the Pacific.

According to 1976 estimates, Santa Paula has a population of almost 19,000 within the city and 32,000 in the trade area. Its main product is citrus with one fruit exchange headquartered in the city shipping about 38 million cartons of citrus annually to markets all over the world. The Union Oil Company was founded in Santa Paula in 1890 and retains a district office and the famous California Oil Museum in the original headquarters building.

Local government is vested in five elected City Council members, one of whom serves as Mayor. The city has its own educational system and is also served by the Ventura College District, and by several public and private colleges and universities. All modes of transportation provide service to and from the city.

Santa Paula weather is mild and cool. Sunny slopes, rolling hills and nearby rugged mountain peaks create a spectacular background. Recreation is the byword. The sandy beaches of the Pacific Ocean are nearby and famed mountain and desert resorts are within easy driving distance.

Santa Paula is near the geographical center of Ventura County in the fertile and picturesque Santa Clara River Valley and is the site of COMSAT GENERAL's Earth Station. The region in which it is situated provides an abundance of natural and man-made benefits for those who live, work and play within its boundaries. How better to put the area in perspective than by borrowing a sentence from a letter received from Allen L. Trecartin, Director, Visitor & Convention Bureau of the Greater Ventura Chamber of Commerce:

"Ventura County is a land of . . . history, sandy beaches, marinas and mountains, citrus groves and oil wells, agricultural fields, modern industry, and military bases, condors, the Channel Islands National Monument and open space in Los Padres National Forest for all outdoor recreation."

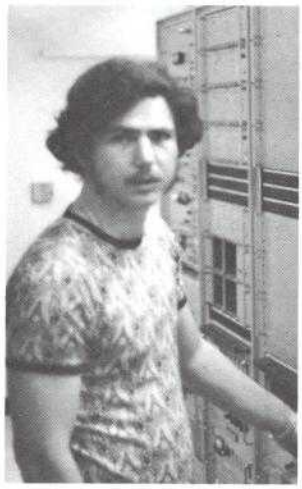
10 years with COMSAT

Appearing on the next page are Santa Paula personnel who have completed 10 years service with COMSAT.

Steve Beane
Station Technician

Tom Darter
Station Technician

Chris Ellis
Communications Operator



Frank Garner
Station Technician

Jeff Gnass
Station Technician

Dave Gonzales
Communications Operator

Dennis Hill
Station Technician

Pat Hogan
Secretary

Gordon Johnson
Station Engineer

Mike Kahl
Custodian

Charles Kraft
Maintenance Technician

Frank Meyer
Facilities Mechanic

Terri Myers
Communications Operator

Jim Peasley
Station Technician

Shirley Speer
Communications Operator

The Facilities Team, intramural runner-up for 1978, from left to right: (top row) Scott Layton, Lenny Howard, Coach John Gerace, Linda Gerace, James Hawes, Gale Gerlack, Barbara Carter and Art Meyers; (bottom row) Keith Blickenstaff, Curtis Carter, Jay Cox, Brent Bell, Fred Seaman and the Geraces' son Johnny.

They call it Softball

BY HANK MUELLER

In the last issue of PATHWAYS I reported that the COMSAT Labs Intramural Softball League was about to get under way. As I was writing about the new season about to start a pang of nostalgia struck. Nostalgia of years gone by of intramural softball here at the Labs.

Softball is a game that most anyone can play: young and old, agile and clumsy, athletic and non-athletic, male and female. It's a game where it doesn't really matter how good you are as long as the competition is even. It's a good time added to a competitive spirit of, "I'll do the best I can." It's a game where a little refreshment just adds to the fun and everyone gets to know everyone else just a little better. I remember that, when the first season started here at the Labs, I knew mainly just those with whom I worked each day. After our first season I knew many, many more of my fellow Labs people.

A little history might be appropriate at this point. It all started back in 1971. Blaine Shatzer, Bill Burch, Bob Cool and Dave Lewis each fielded a team, starting the first Labs Intramural Softball League. Interest that year was mainly among the men, but some of the more daring gals decided to join in the fun. The season ended with Shatzer's Slammers winning an excellently played 2-1 ballgame against Bill Burch's team in the championship final. The championship game was postponed several times due to weather and business or vacation schedules, but this proved to be a boon to the infant league. In the interim between the regular league season and the championship game there was such a proliferation of heckling, name-calling and self glorification between two challengers (all in good fun) that interest in the game reached a fever pitch, setting off a spark for the next season.

In 1972, secretaries, managers and all forms and shapes of Labs personnel flocked to the field in anticipation of the new season. Hardly a soul in the Labs was not included, somehow, in the afterwork festivities at COMSAT field. Those who did not play (and few they were) came to cheer on their favorites and enjoy Norm Miller's refreshment stand. The league grew to six teams and formed two divisions East and West. Bill Windell's Shop team took the honors in the East and my own CPL team won the West in as thrilling a season playoff as the big leagues might fashion. We were one game behind Blaine Shatzer's Spacecraft team, with a doubleheader against them facing us. I (then being of the long hair persuasion) promised to have my hair cut if my team could win both games and go into the championship game. Well, that was enough incentive for the CPL team to win and Marianne Merrihew made certain that I stuck to my promise by taking a chunk of my hair right on the spot.

We lost the championship that year, and Bill Windell's team won the trophy and my hunk of hair (which he still has). An All-Star game was added that year as a season wrap up.

1973 saw as much enthusiasm for softball as the previous year. Six teams took to the field in June. Again the Labs was softball crazy for the summer. This time the season was split in half. Bill Windell's Shop team won both halves and thus the season championship. Two All-Star games were played, one at the season split and one at the end of the season. The Shop team played against the All-Stars at season's end and lost after forcing the Labs best to go an extra three innings to break a 9-9 tie after regulation play.

"It doesn't matter how good you are as long as the competition's even".

The 1978 Championship Shop Team was made up of, from left to right: (front row) Duane Johnson, John Kisner, Jeff Worth, Sherry Braham, Fred Myers, John Bowles and Umpire Bill Burch; (back row) Coach Bert Collins, Umpire Hank Mueller, Bob Gruner, League Commissioner Phipps, Vicki Harner, Roger Carlson, Jeff Jones and Jerry Creamer. Player Bud Swanger is not shown.

1974 was the last season for the old league. This was a period of heavy Labs turn-over and many good softball players were lost, so was a great deal of enthusiasm. The league again went to an East-West division for regulation play. This year Marie Curtis (now Marie Alnutt) took the Shop team to the East title while Carol Luthan (now Carol Van Der Weele) coached her CPL team to the West crown. The two women went into the championship game with as much fight as Bear Bryant and Woodie Hayes would have. Again Shop came out on top.

So enough for nostalgia. This year the softball bug bit again. Facilities' John Gerace, Brendt Bell, Steve Beall and Jay Cox started practicing during lunch time. It wasn't long before the Shop was baiting the "good old boys" from facilities and a game was seen to be in order. Bert Collins took control of the Shop team and a new league was born.

I could feel the stirrings of softball fever, and talk of "let's face off on the diamond after work" was drifting through the Labs. John Phipps took on the task of organizing a league and the Labs soon had four new teams ready to stir up dust on COMSAT field. John himself had a team, Bert Collins took the reins of the perennial champs in the shop, John Gerace not only put a facilities team together but had them stirred up enough that they got uniform shirts and hats, and Bob Pritchard gathered together a fourth team. Softball was back at the Labs. The following is a brief game by game analysis of this season.

League Commissioner John Phipps

In pre-season games Bert Collins' Shop team bested the Facilities Blue Streaks two out of three matches. In the season's opener Phipps' Phuries stomped Prichard's Red Sox 33-8. In game two, Facilities beat the Red Sox 16-6 in a game that stayed close until the last innings. In game three Shop showed who the team to beat was, burying Phipps Phuries 43-5. Game four was a seesaw affair, with the Phuries beating Facilities 21-17. Game five the Shop scared the Red Sox so bad the red stockings went fishing.

As the first half of the young season ended Blaine Shatzer showed his old spunk and his Spacecraft team handed the Blue Streaks a 16-8 defeat. Starting the second half John Gerace's team sent the Shop home with a 18-5 drubbing. The Red Sox, now under new management (Dan McAuliffe), startled the Phuries before losing 15-13; Facilities 28-8 over the Red Sox; Shop 17—Phipps 2; Facilities ended all Phuries' hopes, 13-9; Shop 32—Red Sox 4; and before the season finals, Dan McAuliffe put together a team and bested the Shop 19-15.

The last game of regular season saw Bert Collins lead his Shop team to a 28-5 victory over the Facilities team for the championship of the new league.

And it's not over yet, folks. An All-Star team is going to try to beat the Shop, Blaine Shatzer is mumbling something about how good his Spacecraft team is, John Phipps wants anybody's hide, and so does Dan McAuliffe, and Facilities won't call it quits—they just call it softball.

Notes From Personnel

An analyst looks at hospital costs

(Editor's note. The following article was researched and written at the request of the Personnel Office by Mr. Dan Frakes, Vice President of Patterson & Associates of Washington, D.C.)

On April 7, 1978, an article appeared in the *Washington Post* with the following headline: "Medical Fees Increase 29 to 75 Percent in Three Years."

According to a recent study of physician fees by the White House Council on Wage and Price Stability, last year fees went up 9.3 percent, half again as much as the cost of living. A simple tonsillectomy went from $175 in 1975 to $250 in 1978, an increase of 43 percent.

Obviously, this dramatic rise in cost is having a terrible effect on the cost of obtaining insurance to provide protection for you and your families. The question that everyone is now asking is what can be done to hold down these costs? One possibility is to discuss the fees with your doctor prior to treatment. You might discuss the idea of having treatment performed on an outpatient basis instead of being kept in a hospital overnight.

The plan at COMSAT provides coverage for outpatient treatment and allows full coverage for outpatient pre-operative testing when done within 48 hours prior to the operation.

Another area where you can control costs is in the selection of the hospital if confinement is required. The hospital costs in the Washington area differ dramatically. Most doctors have privileges at more than one hospital, so you might find out which they are and make your choice. The following is a comparison of hospital room and board rates of several area hospitals. The rates were in effect as of July, 1978.

Hospital	*Semi-private*	*Private*
Alexandria	$102	$120
Children's	185	185
Doctors'	163	185
Georgetown	143	158
George Washington	178	205
Holy Cross	90	102
Sibley	95	106
Surburban	83	88

You can see there is more than a 100 percent differential between some of these. Since an average hospital stay is approximately eight days, the difference between Suburban and George Washington would mean a savings of $760. That kind of savings on a regular basis would have a very meaningful effect on the cost of the group medical plan.

Internal Revenue runs Problem Resolution Program

It's been over a year since the Internal Revenue Service began solving special tax problems through a program called Problem Resolution. Dubbed "PRP" for Problem Resolution Program, the new concept was created to help taxpayers obtain action on problems they are not able to settle through normal IRS channels.

Over the past year more than 50,000 taxpayers have called or visited PRP staffers in order to solve seemingly unsolvable problems with the IRS. Many of these taxpayers were concerned about such things as the status of an audit or where an account stood in the collection process. Problems with refund checks also ranked high on the inquiry list.

Although the difficulties handled by PRP varied, most had one thing in common: they were questions usually settled through normal channels, but for some reason these channels had broken down. The breakdowns weren't frequent, considering the number of contacts IRS personnel make with taxpayers every year. But they were frustrating to the taxpayers who were tangled up in one of the procedural failures.

Generally, the reasons for the breakdowns are pretty basic. There are 71,000 permanent and 14,000 temporary people working for the Internal Revenue Service. Many of these persons deal directly with taxpayers—answering questions (37.1 million last year), helping with tax returns (133.7 million of all kinds filed in 1977), auditing their returns (2.3 million last year), and collecting delinquent taxes ($3.1 billion in 1977). The sheer numbers themselves mean human error will occur—such as losing a request for action, or giving out wrong information. It's inevitable. Sometimes lines of communication fail. The PRP was set up to help taxpayers with such errors.

PRP also is helping the IRS handle more unusual problems—problems which sometimes reflect quirks in the system itself. It's these kinds of problems which, when brought to the attention of the IRS, can result in changes being made. These changes can then ward off future problems for taxpayers.

The key to a successful PRP program, of course, is that taxpayers go through normal channels first in attempting to resolve their problems. If such action fails, then the taxpayer contacts the IRS and asks for the Problem Resolution Officer.

One other point about PRP, it is not designed to handle such matters as the integrity of IRS employees, IRS hiring practices, disputed technical issues, or tax assessments or adjustments which are under appeal. In such cases, the taxpayer should call the IRS and be referred to the proper office. **—IRS**

Network Bits

Field Correspondents

Andover
Joanne Witas

Brewster
Dorothy Buckingham

Cayey
John Gonzalez

Etam
Bev Conner

Jamesburg
C.B. Marshall

Labs
Norma Broughman
Joan Prince
Blaine Shatzer

M & S Center
Darleen Jones

New York
Stephen Keller

Paumalu
Bob Kumasaka

Plaza
Mary Lane

Santa Paula
Pat Hogan

Southbury
Eileen Jacobsen

ETAM. Station Manager **Bill Miller** and **Bill Bell** both spent brief periods in the hospital but are now back at work. **Mike Britner** and **Betty Bell** recently completed five years service with COMSAT and were presented with service awards. The **Lynn Rectors** have a third son, **Russell (Rusty) Fax.**

With the approach of Fall, vacations became numerous: **Mike Britner** and family visited the Ozarks in Missouri and Arkansas; the **Spencer Everly** family, Kings Dominion and Williamsburg, Virginia; the **Paul Mauzy** family to the Pittsburgh, Pennsylvania, Zoo and Kenneywood Park; **Bill Mayes** and family, Geauga Lake Park and Sea World at Aurora, Ohio; **Mike O'Hara and wife,** to Knoxville, Iowa, to see the National Sprint Car Races; the **Lynn Rector** family visited Kings Dominion and the Sea World in Aurora; and the **Gerald Reeves** family took a trip to Cedar Point, Ohio.

Paul Mauzy is brushing up on his carpentry skills. He recently moved into his new home in Parsons and is doing a lot of the finishing work himself. The ECEA sponsored an after-hours Beer Party in the local "Hamburger Heaven" and a Kentucky Fried Chicken luncheon in the canteen. The Annual Preston County Buckwheat Festival was held the last weekend in September. (COMSAT President Charyk crowned the Festival Queen in 1968.) The Forest Festival was held in Elkins, West Virginia, in early October.

—Bev Conner

JAMESBURG. Six NECOM-Nigeria engineers trained at the station during August and September. COMSAT General's **Robert N. Smith** served as coordinator. At the time of this writing, **Roy Scheiter** was home convalescing from recent surgery. Station Secretary **Patty Blatnik** was presented with her Ten Year Service Award by Station Manager **John Scroggs.**

Station Secretary Patty Blatnik receives service award from Station Manager John Scroggs.

Tony Modica, Electronic Technician, has joined the station staff. Tony, who recently completed a four-year tour with the Air Force, and wife **Linda** hail from Michigan and are now living in Salinas. New CEA officers at Jamesburg are: **Don Palmer,** President; **Bob Trammell,** Vice President; **Jack Inman,** Treasurer; and **Peter Rasher,** Secretary.

Jamesburg now has its own instructors in Cardiopulmonary Resuscitation (CPR) and Multi Media First Aid as the result of recently completed training. Facilities Engineer **Walter Robinson** and Team "D" Supervisor **George Furford** are our CPR instructors and Station Administrator **Stan Nubin** and Material Control Specialist and Accounts Clerk **Cambrel Marshall** are our Multi Media First Aid instructors.

—C. B. Marshall

Undergoing training at Jamesburg were Nigerian Engineers, from left to right, S. K. Sarumi, S. Imudia, T. A. A. Bakare, W. Ogunwolu, Y. Adegbuji and T. Ogunnika. COMSAT General's Bob Smith, Coordinator, is seen at extreme right.

LABS. The June Safety Award was presented to **Ken Stuart** for his suggestion that a special extension to the Medical Facility be provided for use in emergencies only. Patent Incentive Awards were presented to **Mian Ali, Francois Assal, Arnold Berman, James Dunlop, Nelson Jacobus, Chris Mahle, John Snyder, Joe Stockel, Gert Van Ommering, George Welti** and **Al Williams.**

Ray Joyner, a technical illustrator in the Technical Publications Section, won second place for his student art entry in the 1978 Industrial

Shown above with their Montgomery County League second place trophy are the members of the COMSAT Volleyball Team, from left to right, Lew Parker, Bill Lowe, Steve Kirch, Brenda Knode, George Huson and Dominican Republic exchange student Yamilka Canahuate. Regular players not shown are Mary Penrose, Olivia Piontek, Neil Helm, Joe Stockel and Bernie Free.

Labs' Nurse Mowen earns honors

Two honors have been earned by Mrs. Betty Mowen, Occupational Health Nurse at COMSAT Laboratories. She has successfully completed an extensive certification board examination in occupational health nursing and is now designated as a Certified Occupational Health Nurse, and she was recently elected President of the Seneca Valley Occupational Health Nurses Association.

Mrs. Mowen now has the highest level of certification available to occupational health nurses. To qualify for this, the American Board for Occupational Health Nurses, Inc. (ABOHN), specifies that a registered nurse must be a practicing occupational health nurse for no less than five years, have 60 hours of training in occupational health nursing, and pass the day-long examination. Of the 10,000 nurses who belong to the ABOHN, less than 500 are Certified Occupational Health Nurses. She is also President of one of the 152 local chapters of ABOHN.

A graduate of the Jefferson Hospital School of Nursing, Mrs. Mowen is currently enrolled at St. Joseph's College, studying for a Bachelor of Science degree in Professional Arts. She is an American Red Cross First Aid Instructor and a Certified Audiometric Technician.

Graphics International Art Competition and Exhibit at the 5th Annual International Conference held recently at the Shoreham-American Hotel in Washington. Ray has worked as an illustrator at the Labs since 1969.

Receiving Service Awards were (10 years) **Don Rivera, Jeff Hyde, Forrest Bolinger, Helmo Raag, Paul Fleming, George Hewlin, Bill Windell, Bob Funkhouser, Paul Schrantz, Joe Jerome, John Reynolds** and **Shirley Taylor.** Five Year Awards were presented to **Gundars Osvalds, John Bleiweis, Cris Inman, Vicki Harner, Ashok Kaul, Irwin Feigenbaum, Dave Weinreich, Bud Bell, Jay Cox, Annie Garza, Clarence Dorsey** and **Charlotte Scott.**

Our congratulations to **Gail Stewart** of Labs Personnel and INTELSAT'S **Joe Jankowski** on their recent marriage. They honeymooned in the Bahamas. **Pam Wood's** daughter Casey played the violin at a Suzuki Festival at Wolf Trap with President and Mrs. Carter in attendance to hear their daughter Amy, who also played the violin. An up and coming "blue grass" musician in our Facilities Department is **Page Heston** who made his debut at the recent Labs Wine and Cheese Party on behalf of the United Way.

Among our new hires are **Olivia Piontek, Richard Thorne, Teresa Magaha, Donald Dopp, Colleen Sensabaugh, David Jupin, Norman Farmer, Mary Hoff, John Mayer, Ray Huber, David Burford, D. Nath Srinivas, Steve Cook, Vladimir Krickevsky, Jack Singer, Tim Deblois, Lynnette Collins, Patricia Weaver, Brenda Gray, Peter Hoover, Gayle Davis, Shirley Anders, Patricia Wolfe** and **Liz Burdette.**

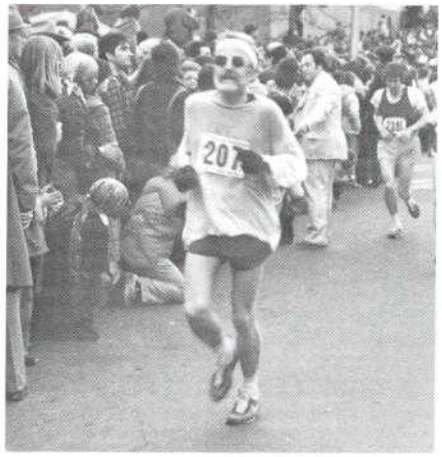
Recently departing the Labs were **Leonard Booth, Joano Brandao, George Dill, Chuck Harp** and **Pam Beckelman. Steve Beall** is building his new "first" home into which he hopes to have moved by the time you read this column. **Ray Worthmiller** is back at work after a stay in the hospital. The **Brent Bells** are parents of a new baby boy.

Vacationers include **Jack Allison** who took a month and headed west; **Art Myers** also took three weeks and went west; the **Allan Cramers** vacationed in South Carolina; **Claudette Tucker** and **Shirley Taylor** visited INTELSAT's first retiree **Dell Brantley** in Mississippi; and **Walt Morgan** spent his holiday in the Virgin Islands. —**B.P.S.**

PLAZA. A farewell party was held for **Jim May** of the Operations Analysis Division who retired after 10 years with COMSAT. Jim plans to do some traveling with Ireland and Morocco in the offing. The distinction of being among the "oldest" COMSAT/COMSAT GENERAL employees in terms of years of service (they have or will have received 15-year Service Awards by the year's end) goes to: **Dr. Charyk, William Callaway, Lewis Meyer, Jeannette Loomis, Sidney Metzger, Josephine Chapman, James Potts** and **John A. Johnson.**

Margo Loman, Administrative Policies and Procedures, and **Jim Durham** were married recently, as were Personnel's **Carolyn Cunningham** and **Walter Billy.** It was a baby boy for the **Ronnie Liebermans, Scott Ian.**

Bernie Coleman of the Orbital Mechanics and Data Processing Division and family toured Niagara Falls and the Thousand Islands, playland of the St. Lawrence Seaway. **Barbara Moseley** has transferred from the Mini-Micro Based Systems Department to Realtime Computer Systems Department. —**Mary Lane**



Marathon runner Van Trees

COMSAT's Dr. Harry Van Trees participates in the running community's traditional rite of Spring, the Boston Marathon. Dr. Van Trees is seen here finishing the more than 26-mile marathon in downtown Boston—running time was three hours and 20 minutes. Dr. Van Trees keeps in condition by running 30-35 miles per week, increasing the distance by 10 miles per week three months preceding the Marathon. He has run in the Boston Marathon since 1972.

SOUTHBURY. The station was recently visited by COMSAT GENERAL President **J. L. McLucas** and Operations Vice President **Don Owen. Gilbert R. Estores,** Shift Team Leader, and family are now with us having transferred from Paumalu. Other new staffers include MARISAT Operators **Agnes Tomlinson** and **Jo Anne Coughter.**

Among other recent visitors to the station were Mr. **Takehiro Ikeuchi** of Nippon Telegraph & Telephone accompanied by Mr. **Akiro Ogawa,** Vice President of the Institute for Future Technology in Tokyo, and Professor **Takeshi Ido** of Tokai University. Our Japanese visitors are involved in Japanese domestic satellite communications policy and were interested in observing the Southbury operation at first hand.

MARISAT voice traffic has been averaging over 1,000 minutes almost daily keeping our operators busy and under pressure, but, as our many customers report, always pleasant and courteous. The Southbury Station has become the prime TT&C Station for the recently launched COMSTAR D-3.

Our best go with the **Mike Masse** family, recently departed for Milford, Ohio. **Dolores** and **Paul Raneri** recently vacationed on a cruise to Nova Scotia. **Rose Marie Eureka** and family went camping at Lake George, New York. The Employees Association picnic was held recently and, although late, was reportedly as good as ever with plenty of food and games for staffers and families.

—**Eileen Jacobsen**

Employee Relations Specialist

Personnel's Deputy Director Roy A. Greene discusses responsibilities and duties of newly appointed Employee Relations Specialist Holly Pryatel.

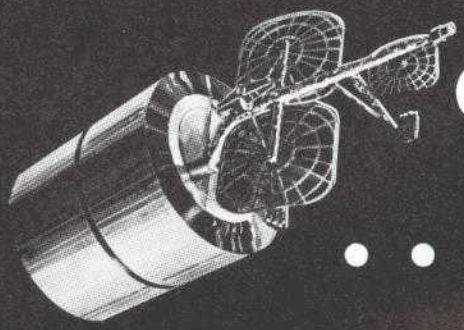
ADDENDA

SBS to petition for rehearing of court decision

SBS has announced that it will join the FCC in petitioning for a rehearing en banc (by the full Court) of the recent Court of Appeals decision which would reverse and remand SBS's authorization from the FCC to proceed toward establishment of a domestic communications satellite system.

In addition to petitioning for a rehearing, SBS will seek authorization to continue its system implementation activities pending resolution of the antitrust question concerning joint participation in SBS by COMSAT and IBM. It is on that question that the Appeals Court decision called for further FCC proceedings.

The world's in closer touch . . .via satellite



By pioneering the global communications satellite system, COMSAT helped put more than 100 countries in touch. And now COMSAT General Corporation is providing maritime satellite communications, satellites for U.S. domestic communications, and is engaged in other programs for domestic communications.

Whoever you are, wherever you are, we're working to put you in touch via satellite. Better communications helps everybody, and COMSAT helps it happen.

COMSAT

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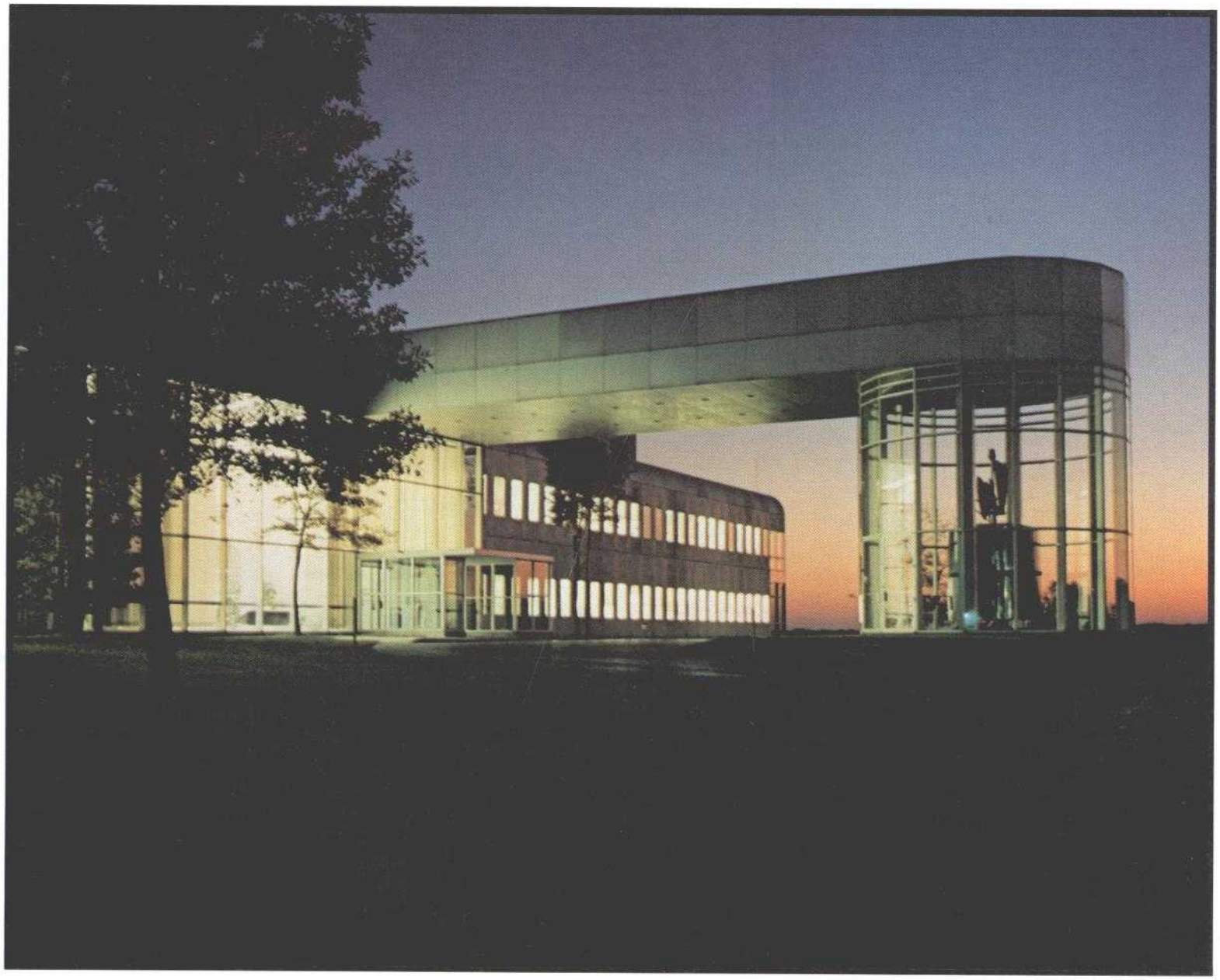

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Cover. *COMSAT Laboratories in suburban Maryland near Washington, D.C.*
PHOTO BY ALLAN GALFUND

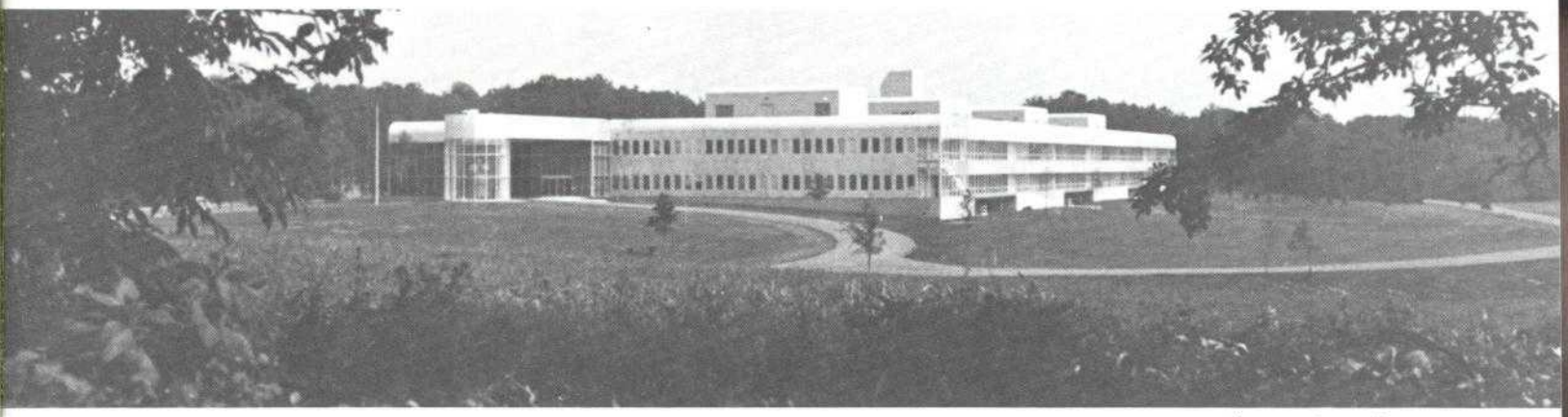


PHOTO BY ALLAN GALFUND

COMSAT Laboratories:

Developing tomorrow's technology today

STORY BY ALLAN GALFUND
PHOTOS BY BILL MEGNA

Author's note. I would like to acknowledge the assistance of Louis Pollack, Assistant Director of COMSAT Laboratories, and Director of Administration, Lyn Russell, in the preparation of this article.

In the first days of September 1978, an experiment was conducted in conjunction with the United Nations Conference on Technical Cooperation Among Developing Nations held in Buenos Aires, Argentina. As the delegates spoke their words were being simultaneously interpreted in the five official languages of international conferences: French, English, Spanish, Russian and Chinese.

Nothing unusual in that—simultaneous interpretation is a routine practice in international conferences. What was unusual in this instance was that while the speakers were in Buenos Aires, the interpreters were more than 5,000 miles away—in the United Nations headquarters in New York City.

To carry out this experiment, COMSAT Laboratories had installed a newly-developed transportable terminal on the roof of the twelve-story conference building in Buenos Aires. The terminal was linked to an earth terminal at the United Nations in New York via the experimental Communications Technology Satellite (CTS) operated in the 14/12 GHz band.

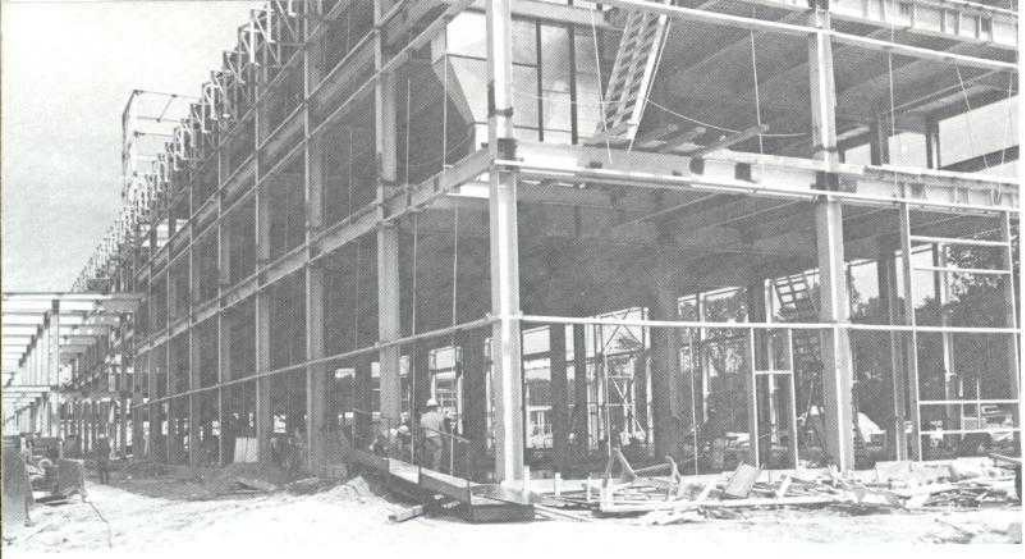
The demonstration was one of many applications that have evolved from the explosive growth of satellite communications technology in the last decade.

In the early and middle sixties, satellite communications technology was breaking new ground and COMSAT, in cooperation with INTELSAT, was just beginning to establish what would eventually become the INTELSAT global communications satellite system. In those formative years, a small group of COMSAT scientists and engineers in downtown Washington, D.C., focused their attention on advancing the state of the art of satellite communications.

In 1966, COMSAT Labs began its research and development efforts under W. L. Pritchard, its first director. As Robert Strauss (now Director of Reliability and Quality Assurance) recalls: "Things did not remain the same for very long in

Director of COMSAT Laboratories, Dr. B. I. Edelson

Mr. Galfund is Manager, Technical Information, COMSAT Laboratories.



COMSAT Laboratories under construction in 1968

PHOTO BY ALLAN GALFUND

those early days. I was returning to my office at 1835 K Street after a vacation in July 1966, and found to my astonishment that all the furniture had been removed from my office. As a matter of fact, everyone's furniture had been removed as well. During my absence, the Labs had vacated the space on K Street and had consolidated at 2100 L Street."

Chief Scientist Sidney Metzger reflects on those years. "We were concerned about our need for proper test equipment so that we could check out our theories with practical experiments. One of our early concerns was in the area of multiple access. The problem of amplifying a number of separate radio carriers through a single amplifier (multiple access) was one that was unique to satellite communications. It was an untried field since telecommunications companies had not felt any urgent need for multiple access in terrestrial facilities. Emeric Podraczky, present Director of Engineering of INTELSAT, and Arnold Berman, now Director of the Microwave Laboratory, but both then members of the RF Techniques branch, wrote the first paper on multiple access."

"We reasoned," Metzger continued, "that a major advantage of satellite communications would be in its capability for multiple access. But would there be any interference when a number of countries accessed the same satellite? We were going to find out."

COMSAT Labs initiated its research and development program with studies by the engineering staff to determine the course of future communications satellite technology development. The studies were followed a year later by the establishment of a COMSAT R&D division to investigate advanced technology and an advisory board to recommend future R&D programs.

It soon became apparent to the late Siegfried Reiger, then Vice-President/Technical, and to Joseph V. Charyk, President, that a permanent research and development laboratory was essential. An outside committee that, incidentally, included John V. Harrington, then a professor at MIT and now COMSAT's Vice President, Research and Engineering, endorsed the concept. The facility was then planned to provide a place for scientists and engineers where new technologies could be pursued and applied to corporate needs.

Reiger believed strongly that a facility such as he envisioned would attract and retain highly qualified researchers. He sought to build a team that could resolve the problems facing this new technology and lived to see his dream fulfilled, but died less than a year after the Labs opened.

Ground was broken for the present COMSAT Labs in Clarksburg, Maryland, in January 1968, and the structure was completed in September 1969.

COMSAT Laboratories, the research and development center of the Corporation, lies 35 miles north of Washington, D.C., on the rolling terrain of a 210-acre tract of rural Maryland countryside. The Laboratories comprise 254,000 square feet of the most modern facilities and a staff of about 400 people, nearly half of whom are scientists and engineers. The remainder are technicians and support personnel. About 70 percent of the professional staff have advanced degrees, approximately one-third, PhDs. The building, grounds and equipment, represent an investment of more than $27 million and the annual Labs budget is approximately $20 million. The 1978 expenditures for major programs were:* INTELSAT *R&D, 30 percent; Corporate R&D, 28 percent;* INTELSAT *engineering support, 20 percent; SBS projects, 10 percent; Corporate support, six percent;* COMSAT GENERAL *technical support, four percent; and other special projects, two percent.

Louis Pollack, Assistant Labs Director, was a major figure in the concept, design and development of the Reliable Earth Terminal shown in the background.

After the success of Early Bird and subsequent INTELSAT series of satellites, the satellite systems development continued at a brisk pace. COMSAT experienced a continuous expansion and achieved a remarkable record in the design and operation of the global communications satellite system. In its new COMSAT Laboratories in Clarksburg, the scientists and engineers now concentrated on a variety of new technologies involving radio frequency transmissions, communications processing, spacecraft, physics, systems analysis and systems integration.

As the 1960s gave way to the 1970s, the telecommunications revolution continued unabated. The Labs were now well into their mission of research and development, providing support to INTELSAT, COMSAT and COMSAT GENERAL, and had plunged into projects that were directed at new systems and applications of communications satellites.

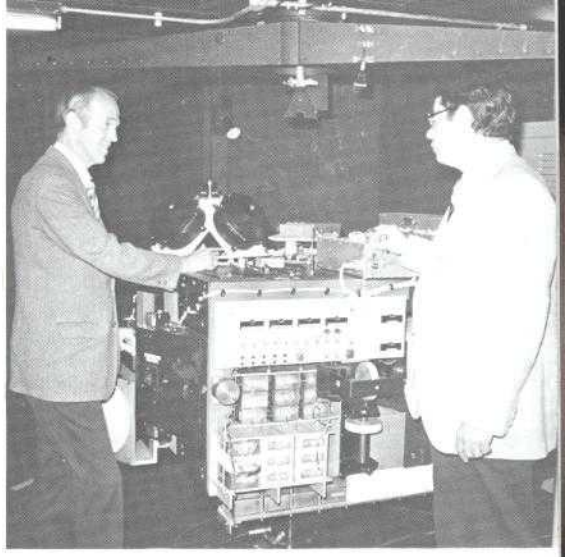
In 1973, Bill Pritchard left as Director of COMSAT Laboratories to take a position as President of Fairchild Space and Electronics Company. His successor as Director was B. I. Edelson who had joined COMSAT as Assistant Director of the Labs in 1968 after a career with the United States Navy.

Through its accomplishments, COMSAT Laboratories has established itself as an international center for advanced research and development. Its extensive development programs in the last ten years of progress have led to improved performance, greater capacity and increased satellite lifetime, as well as new transmission modes.

One important COMSAT Labs development—and one that well illustrates both its "systems" and its "technology" approach—is a demand-assigned, digital, multiple-access system of communications called SPADE. This system, which allows small users to enter the INTELSAT system efficiently and economically, was carried from concept through six years of development to a fully-developed, profitable commercial operation. The SPADE system makes more efficient use of satellite band-width and power by assigning circuits on a user-demand basis. SPADE supports light-density international traffic at low cost, since user charges are based upon the actual time of space segment utilization. This availability of a pool of frequencies on an as-needed basis permits one country to "call up" another as the occasion demands without establishing a full-time circuit.

The first commercial SPADE system went into service in 1973 and by the end of its first year, 10 SPADE terminals were in operation serving 26 traffic streams at an INTELSAT per-minute utilization charge of $.15. Today, 33 SPADE terminals are in operation serving nearly 500 traffic streams with more than three million billable minutes per month at $.08 per-minute utilization charge, a reduction of almost half the original charge. SPADE has become an excellent income source for INTELSAT, contributing approximately $5,500,000 by the end of 1977.

Recognizing that increasing traffic requirements will, in time, overcrowd the present 6/4 GHz satellite operational frequency bands, the Labs has been conducting experiments with Centimeter Wave Beacons in the super-high frequency signal sources onboard the COMSTAR satellites, gathering data on space-to-earth signal propagation. Attenuation, depolarization and phase coherence are measured at 19 GHz and 28 GHz, as functions of weather and other atmospheric conditions. Analysis of these data will help determine minimum power and other performance margins needed for INTELSAT V and other future satellite communications systems operating at frequencies above 15 GHz.



Fred H. Esch, Director of the Spacecraft Laboratory (left), discusses the air bearing platform, a Labs development, with Paul R. Schrantz, Manager, Stabilization and Structures. The Spacecraft Laboratory is involved in mechanical, electrical, thermal and structural subsystem technology for spacecraft application.

Essentially, all the major circuit assemblies of the beacons, as well as the mechanical structures, thermal blankets and radiators were designed, assembled and tested at COMSAT Labs.

(Continued on next page)

Edmund S. Rittner, Director of the Applied Sciences Laboratory, discussing solar cells. The Applied Sciences Laboratory performs research and development in the areas of solid state amplifiers and switches, batteries, ion engines, solar cells, thermal control coatings, radiation damage and materials damage.

Samuel J. Campanella, Director of the Communications Processing Laboratory, has responsibilities in the areas of digital coding, modulation and multiple access techniques for voice, data, facsimile and television signals.

(Continued from page 3)

Another notable COMSAT Labs technical advancement is the development, under INTELSAT sponsorship, of the nickel-hydrogen ($Ni-H_2$) batteries, a promising new contender for satellite secondary power sources over existing nickel-cadmium (Ni-Cd) sources. The rechargeable $Ni-H_2$ batteries are more reliable and longer-lived than Ni-Cd batteries and energy density (energy stored per weight unit) is three to four times greater. Recharge cycles are five to ten times that of the Ni-Cd batteries. As batteries are one of the major life-limiting subsystems in the satellite, the $Ni-H_2$ batteries portend significant improvement for both system reliability and life expectancy of future satellite systems. The nickel-hydrogen batteries, presently flying in a Navy satellite, are being considered for the INTELSAT V and other future communications satellites.

A noteworthy COMSAT Laboratories development is an adaptive echo canceller which removes the echo due to the terrestrial circuit signal reflections without incurring speech chopping or echo spurts encountered with conventional suppressors. Using digital techniques, a replica of whatever echo signal may be encountered is formed, and subtracting the replica from the real echo achieves echo-free operation.

Designed and built by COMSAT Labs, echo cancellers being used in several satellite circuits have produced excellent results. Tests conducted by many organizations, including AT&T and the British Post Office, have demonstrated that the performance of echo canceller-equipped satellite circuits and that of conventional terrestrial circuits were equal in quality.

The Labs has cooperated with COMSAT's newly-established Communications Products Division (CPD) in the transfer of the echo canceller technology from development to production status. According to Lewis S. Norman, General Manager of CPD, "Communications Products Division is currently offering echo cancellers for sale. In the first month of their availability, 80 units were ordered with the initial shipment scheduled for late November."

The Labs has steadily concentrated on meeting growth requirements in the INTELSAT system. To meet these requirements, Research and Development directs its efforts to increasing satellite capacity by increasing power and bandwidth. This led to exploring the use of new frequency bands, reuse of existing frequency bands by polarization discrimination and through antenna beam spatial separation.

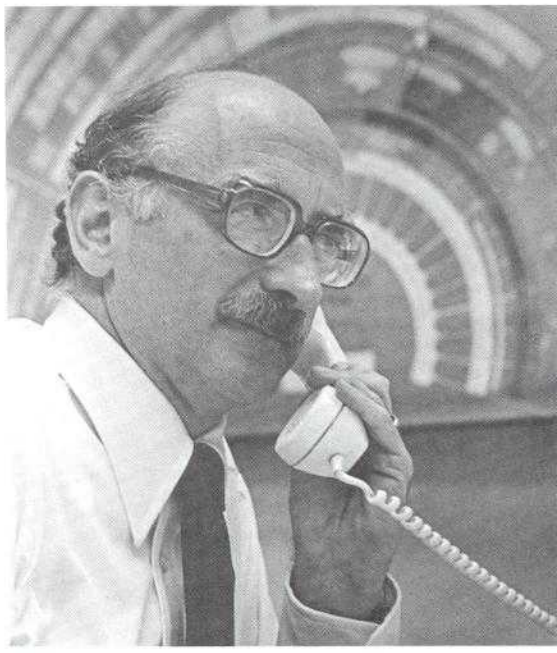
A program has been initiated in the Labs called low-cost TDMA (Time Division Multiple Access) which shows promise of providing a significant decrease in equipment cost while maintaining flexibility in traffic management and compatibility with digital terrestrial traffic in future satellite systems.

Prime power for future communications satellites may be obtained by new, Labs-developed, high-efficiency, radiation-resistant solar cells mounted on a lightweight, deployable, sun-oriented structure. These new solar cells are capable of providing 35 percent more power than present cells.

R&D work in stabilization and propulsion has evolved over the years, determined by INTELSAT's requirements. Advances in these technologies have been vigorously pursued to enhance reliability, improved earth-pointing and yaw accuracy, simplified operations, lighter solar arrays and reduced temperature variations.

Extensive research and development efforts at COMSAT Laboratories have resulted in significant advances in the state of the art of microwave filter realization and

Robert Strauss, Director of Reliability and Quality Assurance, conducts R&D associated with system earth station and satellite applications, the development of new R&D techniques, meteorology, calibration, advanced device evaluation and part control specifications.

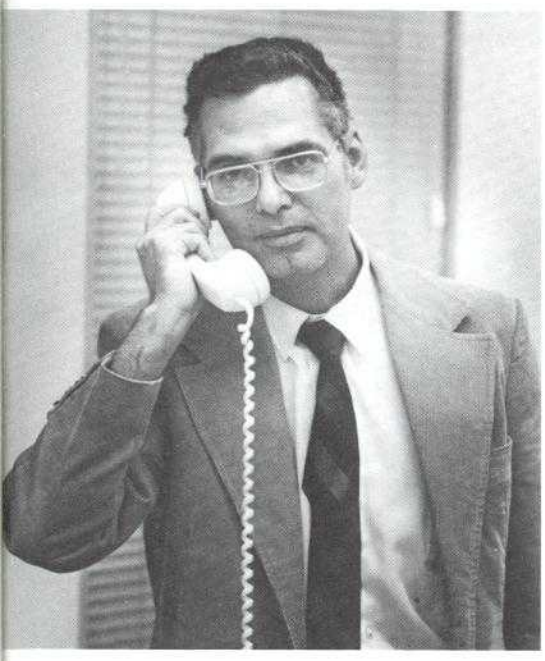


technology. The introduction of multiple coupling in waveguide cavity structures permitted the realization of superior filtering functions at the same time that weight was reduced. Such filters provide performance specifications which set the standards for the INTELSAT V satellite communications system.

Laboratories Services provide essential support to the research and development segments of COMSAT Labs. These include Engineering Services, Facilities, Office Services, Technical Publications, Word Processing, and the Technical Library. While organizationally a part of the Laboratories, the Computer Center services the entire corporation.

As an indicator of the advances in electronic technology that COMSAT Laboratories has contributed to the growth in satellite communications in the last 10 years, there have been 152 U.S. patents issued to Labs personnel with 40 more pending. Additionally, there have been 404 foreign patents issued with 258 pending. These patents, U.S. and foreign, have covered the entire spectrum of communications satellite technology: spacecraft structures (stabilization and control), spacecraft power generators and storage (solar cells and arrays), NiH_2 batteries, solid state devices, microwave devices and antennas, television, echo control, noise detection, earth station antennas and communications equipment, satellite systems/TDMA/onboard switching, speech processing, signal and carrier processing systems and components.

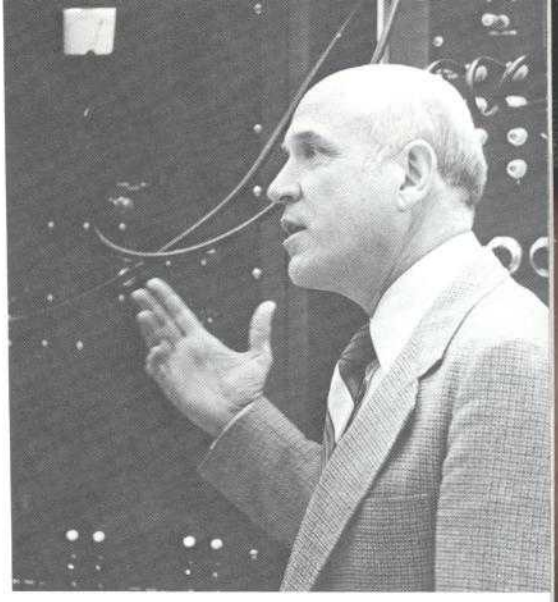
Arnold L. Berman, Director of the Microwave Laboratory, carries out development in antenna systems, microwave circuit design, transponders and earth terminals.



Looking to the future, COMSAT Labs is engaged in research and development programs to advance communications satellite technology on a wide front to augment capacity, increase service flexibility and improve operating efficiency. Satellite signals will be transmitted at higher frequencies to increase the communication capacity by enabling the satellites to take advantage of the additional bandwidth available at these frequencies. Also, the Laboratories are developing methods for all types of communications, voice, video and data, to be transmitted in digital rather than analog form.

Since COMSAT Laboratories serves as a focus for all of the Corporation's research and development activities, the Corporation depends on the Labs to keep it abreast of the latest developments, to satisfy its need for satellite communications growth and to explore new technology which may make possible new roles for communications satellites.

In a paper written for the AIAA 7th Communications Satellite Systems Conference in San Diego, California, co-authors B. I. Edelson and Walter L. Morgan proposed a bold concept for the 1990s. An orbital antenna farm (OAF) launched on the Space Shuttle would involve the use of a large space station in geostationary orbit to provide a variety of communications services to numerous users. The advantages would be in economy by replacing many smaller satellites with one large space station which has common support and service facilities.



Robert C. Davis is Director of the Transmission Systems Laboratory where R&D is conducted in the areas of computer communications, propagation studies, analysis, modeling, simulation and design of communications networks.

In March 1978, the U.S. Postal Service and COMSAT entered into an agreement to assist the Service in developing and demonstrating an international electronic message service system and in planning a possible one-year field trial. The system would employ COMSAT-operated earth terminals and INTELSAT satellites to transmit messages electronically between the United States and several overseas locations.

COMSAT Labs continues to make significant contributions to the advancement of satellite communications technology which attract imaginative scientists and engineers from around the world. COMSAT Labs most assuredly will continue to maintain its leadership in the field of satellite communications and meet the technological challenges of the 1980s, the 1990s and the 21st century.

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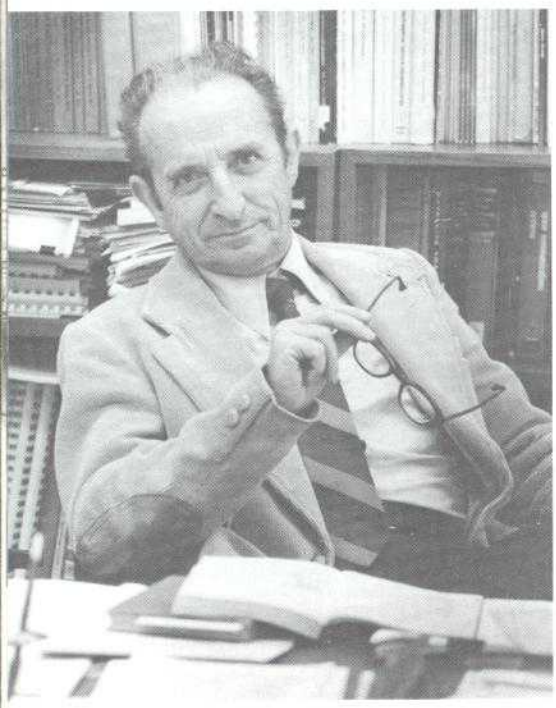

Dr. Pier L. Bargellini, Labs' Senior Scientist, in addition to performing scientific assignments, serves as Chairman of the Editorial Board of the COMSAT Technical Review.

Special projects assigned to Labs' engineers are reviewed by the COMSAT Labs Project Staff. Discussing a proposed project are staff members (left to right) Walter L. Morgan, Randall W. Kreutel, George R. Welti and Helmo Raag. Project staff member William K. Sones is shown in lower right photo.

Computer time-sharing is discussed by Richard Smith, Computer Center Director (left), Lyn O. Russell, Director of Administration (center), and Harry F. Jones, Budget and Program Control Director.

William I. Fallon, Director of Laboratory Services (left), points out machine shop modifications to Clarence B. Crane (center) and Jeffrey L. Rubin.

WORD PROCESSING

COMPUTERIZED FLOW OF WORDS RUNS GAMUT FROM SIMPLE CORRESPONDENCE TO COMPLEX TECHNICAL PAPERS

STORY AND PHOTOS
BY ANNE ARMENTROUT

"It's incredible! The greatest thing since sliced bread!" exclaims Marion Timmons of the General Counsel's office.

"There just aren't enough good words in the dictionary to describe it," adds an enthusiastic Joyce Przelenski, who works for the Associate General Counsel.

And just what is the object of all this praise? Why, Hugo, of course!

Hugo, one must admit, is quite a hunk. However, it is not Hugo's physique that elicits the admiration of these women. Rather, it is his speed, flexibility and dexterity. Hugo, you see, is the name that has been affectionately bestowed upon the word processing equipment in the Office of Corporate Affairs.

Corporate Affairs, with its Lanier equipment, and the International Operations Division, with its Amtex equipment, are the sites that were chosen to test the effectiveness of word processing at Headquarters. According to Bill Connor, Manager of Management Systems Analysis, if these two experiments are successful—and they give every indication of so being—the systems will become permanent fixtures of these offices, and similar facilities will be extended elsewhere within COMSAT.

While word processing is still an innovation being tried and tested at Headquarters, it is almost old hat out at the Labs. There word processing facilities have been in operation since June 1, 1977, churning out everything from relatively simple letters to highly complicated and complex technical papers.

But just what is this wizardry called word processing? It might be defined as those activities involving the transformation of ideas into written communications, that is preparation of typed documentation. It might also be described as the attempt to apply computer technology to the work of an office.

With costs increasing from 30 to 50 percent in many offices, word processing offers one means of stemming rising expenditures while increasing productivity. The savings in direct labor charges during the life of the equipment are greater than the costs of the machinery itself, and the time saved in doing routine or repetitive tasks can be devoted to activities which improve operations elsewhere. In other words, more work gets done with less drudgery because word processing eliminates repetitive typing. A document is typed only once, then recorded magnetically in which form the copy can be corrected, edited and printed out once or as many times as necessary.

It is important to remember that word processing is not just a collection of machines, but a system that can be tailored to the particular needs of the user. One can see how different such systems can be by comparing the two facilities at Headquarters and those at COMSAT Laboratories.

Part of both systems at the Plaza is an OCR reader. OCR, which stands for Optical Character Recognition, allows input typing to be done on any ordinary Selectric typewriter using a special OCR element. Copy is then scanned by the reader and stored on a magnetic medium to be used by the text-editing machines. This allows, for example, the Corporate Secretary's staff to proceed with work on the agenda of the Board of Directors meeting, and a secretary in Public Information to prepare the manuscript for a magazine article (for instance, the one you are reading) while Hugo and his friends make corrections to an important contract.

While the word processing system in IOD operates on the same basic principles as the one in Corporate Affairs, there are some differences. Perhaps the most significant difference is that the OCR reader in IOD has two major programs: One allows the machine to read copy and enter it in the electronic storage medium from which it can be called up on the display screen for editing and subsequent printing of clean copy; the other program allows the reader to scan special message forms prepared using an OCR typing element, and to punch a tape which is subsequently fed to the teletype machines for transmission. According to Buck Jones, Manager of the Communications Center, use of the OCR reader, which his people share with the staff of the word processing center, has greatly increased the speed and efficiency of his whole operation.

There are two other special features of the IOD word processing system. First, the center serves as

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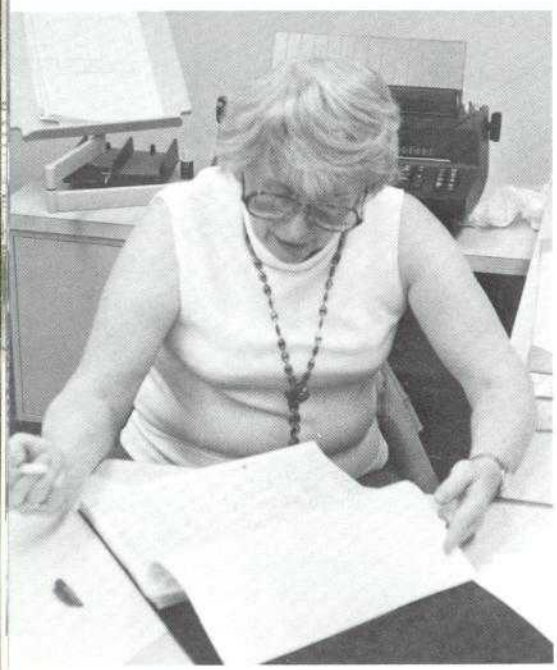
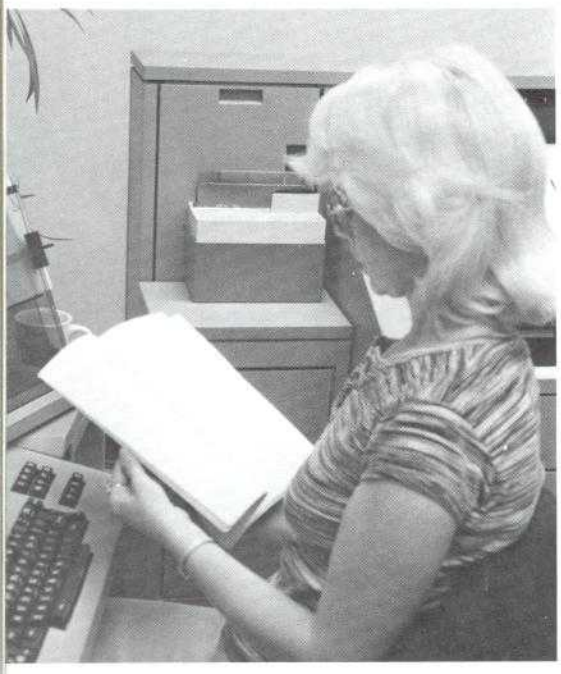
Ms. Armentrout is a Publications Officer in the Office of Public Information.



Word Processing Coordinator Shirley Taylor reviews the log in which she keeps record of work received and completed in the Center.

Specialist Karen Crooks edits material printed by the IBM System 6. Because of the highly technical requirements of much of the material received by the Center, productivity, measured by line count in many business offices, is not applicable in all instances at the Labs Center.



the location for a central dictating system which allows anyone in IOD to dictate material, anytime, anywhere, which is later transcribed by the center staff. Second, the word processing equipment is able to communicate with the COMSAT computer at the Labs, which supplies information to update certain monthly IOD reports. (The Labs, too, has both capabilities as part of its word processing operations.)

While it has taken a while to get the bugs out, "the system has started to hum," says Howard Reagen, Manager of Documentation and Procedures. In fact, things are going so well that the center is about to expand the office to allow more elbow room. The people who, though they may presently be a bit crowded, keep the word processing center humming are supervisor Pam Dahlgren, word processing specialist Arnetta McKenzie and operator Camillia Adams.

While admitting that both the decentralized arrangement and the type of equipment used at Headquarters are suitable to their needs, Pep Ruddiman, Manager of Office Services at the Labs, points out that technical typing requirements at the Labs are more specialized and different from those of a conventional business office. Displaying just a few of the papers delivered to the Labs word processing center by various engineers and scientists—manscripts full of equations, Greek characters and technical language—she adds, "If equipment can handle the Labs' needs, it could handle anyone's." Even with a layman's eye, one quickly sees that here are hardware and software requirements to send word processing sales representatives scurrying back to their offices worrying, scratching their heads and mumbling, "Nobody ever asked me for that kind of thing before."

But the powerful equipment, including the recently installed IBM System 6, is there to handle highly technical material. But even more important than the equipment are the skilled and highly trained specialists who run it. "My people are pretty special," says Ruddiman. "We turn work around at an incredible rate."

Indeed, over the seventeen months of use of word processing at the Labs, the workload has greatly increased while the turnaround time has significantly decreased. While maximum turnaround time is seldom more than five days, 65 percent of the jobs, which average 12 to 15 pages, are handled in 24 hours. Original keyboarding of the work takes about the same amount of time as it would if a secretary were to type the material from the originator's draft. The savings in time, effort and frustration come in the revision cycle.

Practically all manuscripts prepared by Labs research staff go through at least three levels of review—the originator's own revision, review by the boss, and that of a member of higher management. Frequently, especially for material to be published outside COMSAT, there are reviews by the legal staff and by a technical editor. And sometimes there is yet another problem: One paper may be used in several forms—for example, a Technical Memo may become an INTELSAT document and subsequently be published as a journal article—each requiring a different format.

To see what all this means in concrete terms, consider the case Pep Ruddiman thinks one of the worst examples of "change-itis"—a single paper that went through twelve separate revisions. How many months, rather than days, would it have taken if the entire lengthy paper had had to be retyped all the way through each time changes were made?

At present, there are two word

processing centers at the Labs. The small unit is located in the administrative wing and has a coordinator, Shirley Taylor, who schedules the work, oversees the operations of the center and handles production. Additional staff are word processing specialist Gloria Moore, operator Debra Widerman, and work-study student Aletha Woodfield. This unit handles all machine dictation and most short material such as letters, and assists the large center with overload situations.

The larger center is located in the rear of the Labs building, near the Technical Publications section. This center's staff consists of six specialists: Karen Crook, Mary Duvall, Brenda Heller, Jewel McCaa, Marge Moses and Blanche Reid—all experts in producing all types of reports and technical papers or memoranda. Indeed, they seem so to thrive on the challenge of making complex equations and complicated tables space out correctly or of creating a format to make a lengthy memorandum more readable, that the prospect of returning to more conventional if far less difficult typing holds no attraction for them.

Edith Ford, who manages the total word processing operations for the Labs, is both generous and sincere in her praise of the teamwork of her crew. As captain of that team, she juggles the deadlines and assists authors in getting the best job in the least time.

Using word processing, individuals at the Labs now have nine skilled document technicians available to each of them instead of one secretary. The workload of secretaries has become more administrative, although they do still type short material. Each secretary, however, now has a crack team to call on for document preparation or multiple letters. In addition, the Labs has gained documents of higher quality, more uniform appearance, and greater ease of reproduction.

While there are many advantages to word processing, there are, as with all technological innovations, inevitable pitfalls. One of these pitfalls, according to Bill Connor who was in charge of the 1977 study of the need for word processing at COMSAT Headquarters, is that people are tempted to make more changes and corrections because revisions are so easy to do with the machines. Connor also notes that although material is magnetically stored and automatically reproduced, there is still the need to check and proofread copy coming out of the printer every time material is revised.

Pep Ruddiman, too, points out that gains brought by word processing can be nullified. Word processing equipment is expensive—too expensive not to be used fulltime. A balance must be struck, she explains, between having sufficient staff to handle peak days and yet not having excess personnel on slow days. Moreover, working on these machines requires a high degree of concentration. Thus, a centralized facility needs a special environment, such as the ones at the Labs word processing centers, where the specialists suffer a minimum of interruption and distraction and receive a maximum of support and counsel from fellow experts.

One of the biggest problems with word processing, in the opinion of coordinator Shirley Taylor, is that some people, who are the beneficiaries of its services, fail to appreciate the system's limitation. It is sometimes the case, she explains, that a person knows that the machinery is capable of high rates of speed and somehow expects both person and machine to perform miracles of instantaneous produc-

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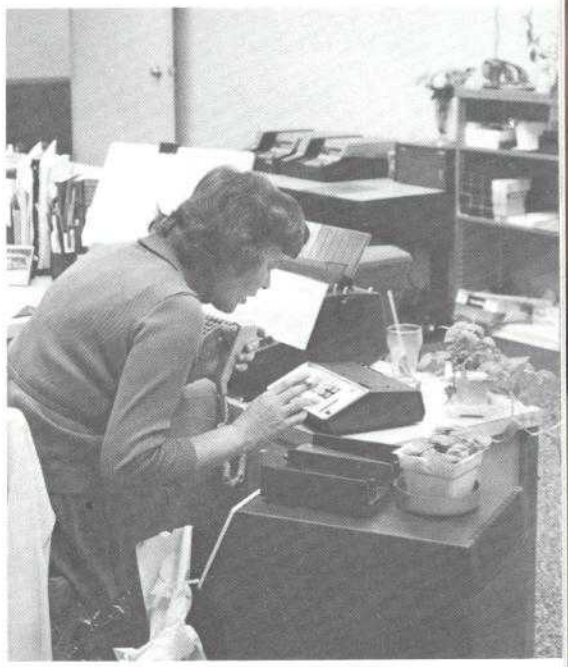
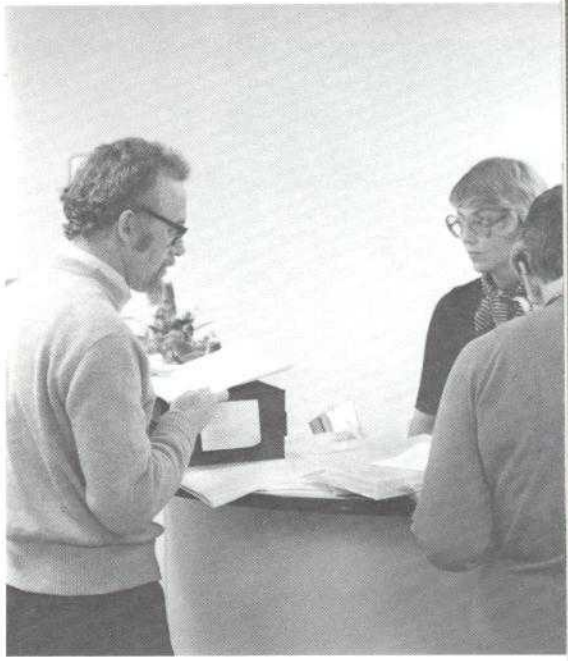


Anytime, anywhere, a member of the Labs staff can pick up a telephone and dictate a letter, report or other material to equipment located in the Center. In the photo above, Pep Ruddiman checks Center equipment located in the administrative wing of the Labs.

Members of the WP Center go over manuscript revisions with a Labs researcher. It is in this phase of document preparation that the real savings in time and problem elimination are realized.



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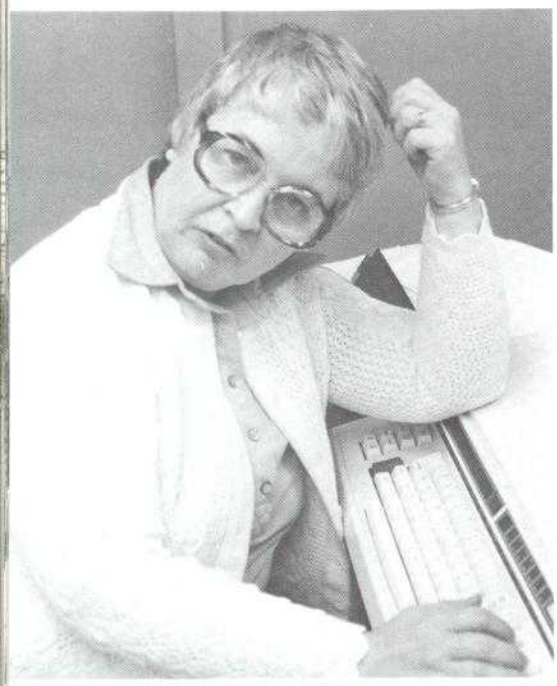
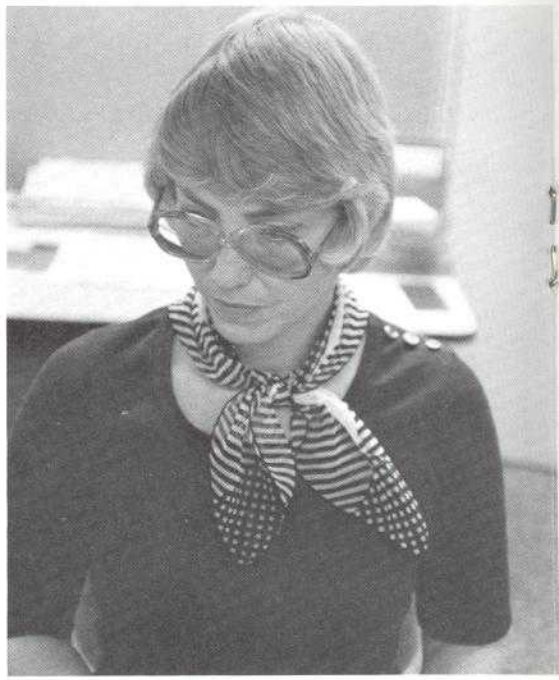
tion. "We're not extensions of the equipment," she says proudly. "Machines do the fast work; people do the thinking."

And that is how it should be: the speed of machines should provide savings of energy, resources and time that people may invest in the uniquely creative and thoughtful actions only humans can perform.



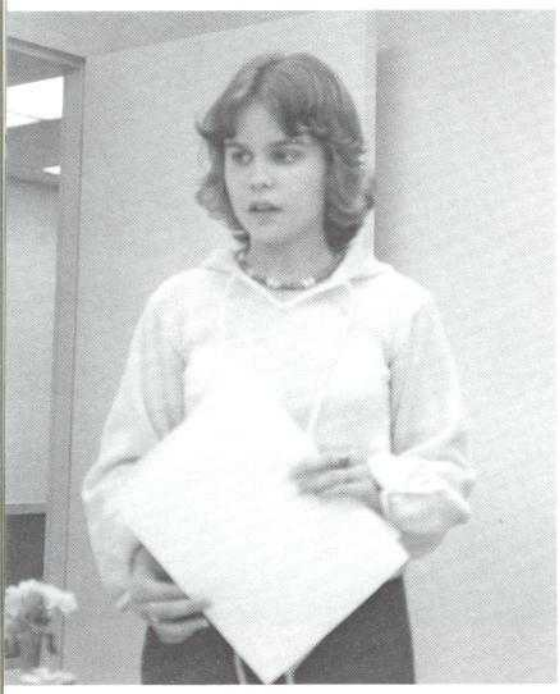
Says Pep Ruddiman of Jewel McCaa, "She couldn't have a better name." Perhaps one of the reasons she's "such a jewel" is that instead of looking at the complex tables and charts as difficult and tedious typing tasks she sees them as intriguing puzzles to be solved.

Pep Ruddiman, Manager of Office Services, COMSAT Laboratories.

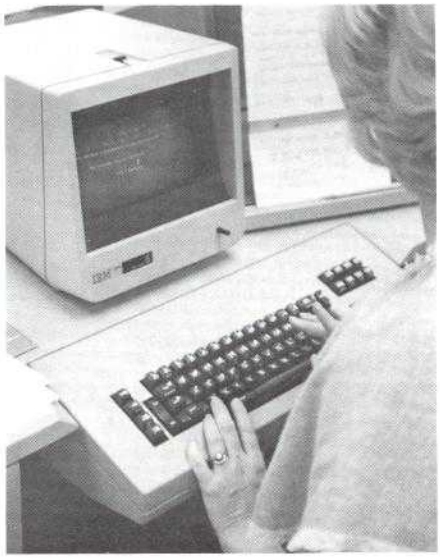


Ability to concentrate and to pay careful attention to details are among the qualities required of and displayed by word processing specialists like Mary Duvall.

Aletha Woodfield learns a great deal about the amazing world of word processing as a work-study student assigned to the Center.



A complex keyboard, a green-glowing CRT display screen, elaborations of electronic wizardry—go into making up the IBM System 6 word processing equipment. But it is the talented hands, and the more talented heads, of specialists like Brenda Heller who really make the operation work.



No two jobs are quite alike, as word processing specialist Blanche Reid would quickly point out. The equipment she uses to keep the flow of words moving is tied in with the COMSAT computer.

COMSAT third quarter earnings nearly $9 million; quarterly dividend of 50 ¢-per-share declared by Directors

COMSAT reported consolidated Net Income of $8,959,000 for the third quarter of 1978, an increase of $925,000 (11.5 percent) from the third quarter of 1977. The increase is primarily attributable to an increase in Net Operating Income from MARISAT and COMSTAR systems services and to the effect reported in the results for the third quarter last year of nonrecurring items described below.

Per-share earnings for the third quarter of 1978 were $1.12 on 8,000,014 shares, up from 81 cents a year ago on 9,928,781 shares. Per-share earnings for 1978 through the third quarter totaled $3.06.

A regular quarterly dividend of 50 cents per share, payable on December 11, 1978, to all shareholders of record on November 10, 1978, was declared by the COMSAT Board of Directors at its monthly meeting in October.

Operating Revenues for the third quarter of 1978 totaled $46,708,000, up $3,789,000 from the third quarter of 1977 resulting from greater revenues from INTELSAT system services, MARISAT system commercial services and COMSTAR system services after a third COMSTAR satellite was placed in service in September. Growth in the communications traffic carried by the Corporation through the INTELSAT system overcame the impact on revenues of the significant reduction in the Corporation's rates for leased channels that resulted from settlement of the Federal Communications Commission (FCC) rate case relative to the Corporation's INTELSAT systems services.

Operating Expenses for the third quarter of 1978, including income taxes, totaled $39,020,000, an increase of $6,262,000 from the third quarter of 1977. Most of the increase is attributable to an increase in COMSTAR and INTELSAT systems depreciation expenses resulting from the placing into service of the third COMSTAR satellite and additional INTELSAT IV-A satellites since the end of the third quarter of 1977; an increase from the third quarter of 1977 in operations and maintenance expenses relating to INTELSAT system services; and a nonrecurring reduction in MARISAT system depreciation expense reported in the results for the third quarter of 1977. The depreciation period for the cost of that part of the MARISAT satellites allocated to service to the U.S. Navy was extended after the Navy in July 1977 agreed to extend from three to five years the period in which it is acquiring service through the satellites. As a result, Operating Expenses for the third quarter of 1977 reflected a reduction in MARISAT system depreciation expense in the amount of $6,716,000, of which $4,700,000 ($2,444,000 net of income tax effects) was the nonrecurring reduction relating to the first six months of 1977.

Net Operating Income totaled $7,688,000, a decrease of $2,473,000 from the third quarter of 1977. Had it not been for the effect of the nonrecurring reduction in MARISAT system depreciation expense reported in the results for the third quarter of 1977, Net Operating Income for the third quarters of 1978 and 1977 would have been approximately the same.

Other Income was $1,271,000, up $3,398,000 from the loss of $2,127,000 for the third quarter of 1977. Other Income for the third quarter of 1977 reflected two nonrecurring items: a write-off of $5,298,000 in deferred aeronautical satellite system costs and payment of interest on a tax assessment that is being appealed. Reflected in Other Income is the Corporation's share of losses of— and amortization of certain costs relating to—Satellite Business Systems (SBS), which reduced Net Income for the 1978 third quarter by $872,000; the reduction attributable to SBS was $664,000 for the third quarter a year ago. SBS, which is in a preoperational phase, is the partnership formed by subsidiaries of COMSAT General Corporation, Aetna Life & Casualty and IBM to establish a domestic communications satellite system.

Compared with the second quarter of 1978, consolidated Net Income for the third quarter of 1978 increased by $1,217,000, Operating Revenues increased by $2,988,000, Operating Expenses increased by $1,651,000, Net Operating Income increased by $1,337,000 and Other Income decreased by $120,000.

President announces nominees for COMSAT Board of Directors

The President has announced that he will nominate Jesse Hill, Jr., and Joan F. Tobin to be members of the COMSAT Board of Directors.

Mr. Hill, 52, of Atlanta, Georgia, is President and Chief Executive Officer of the Atlanta Life Insurance Company, the largest stockholder life insurance company or financial institution controlled and managed by black Americans. He is also President of the Atlanta Chamber of Commerce.

Ms. Tobin, 35, of Washington, D.C., is President of Tobin Enterprises, Inc., which holds major or controlling interests in growth companies, analyzes potential mergers, acquisitions, and partnerships, structures financial arrangements, and actively participates in the management of component companies. She is also Vice President of Tobin International, an export-import business.

Former Chairman and Chief Executive dies in accident

Leo Dewey Welch, 80, the first chairman and chief executive officer of COMSAT, was killed recently in a collision of an automobile and an oil truck near Cuernavaca, Mexico.

Three others in the car with Mr. Welch also died in the crash. He was vacationing in Mexico at the time.

A well-known industrialist and banker, Mr. Welch was chairman of Standard Oil Co. of New Jersey when he was appointed by President John F. Kennedy to head the newly formed COMSAT in early 1963.

He retired from active direction of the Corporation in 1965, explaining that he wanted to slow down his pace and noting that the "establishment phase of the Corporation" had been completed. He remained on the Board of Directors until 1977.

He is survived by a daughter, Mrs. Emmet Whitlock, of Oyster Bay, N.Y., and two grandchildren.

Harrington announces restructuring of R & E responsibilities

John V. Harrington, Vice President, Research and Engineering, recently announced the restructuring of engineering activities within R and E.

E. T. Jilg will be on special assignment to R. S. Bodman, working on the development of the technical services line of business. H. L. Van Trees has been granted a leave of absence from the Corporation to become the Chief Scientist of the U.S. Air Force.

M. J. Votaw, who is returning from an assignment at Satellite Business Systems, has been assigned responsibility for Space Segment activities within Engineering. F. Weber will serve as Deputy to Votaw. Reporting to Votaw will be the Space Segment Engineering Division headed by W. D. Brown and the Orbital Mechanics and Data Processing Division headed by W. D. Kinney with F. N. Ormsby as deputy.

J. B. Potts will be responsible for Earth Terminal and Systems Engineering activities. The Earth Station Engineering Division under R. N. Benedict and a Systems Engineering Division to be headed by H. J. Weiss will report to Potts. Members of the current Systems Studies Division will continue to report to Weiss. The remaining staff in Advanced Systems, principally R. K. Kwan, J. L. Lucas, and M. Mohajeri, are assigned to COMSAT Laboratories.

T. P. McGarty will become responsible for Equipment Integration activities. Reporting to Dr. McGarty will be the Monitor and Control Engineering Division under R. S. Cooperman, and a Program Management organization for various control system projects. R. C. Gibbons, R. W. White, and C. M. Graves are initially assigned to the new program management organization.

The Satellite Evaluation Department headed by R. J. Rogers and currently part of the INTELSAT Management Division has been assigned to the Orbital Mechanics and Data Processing Division.

"These realignments should place us in an excellent position to deal with the engineering challenges presently confronting us," said Mr. Harrington.

COMSAT/ERT negotiations end

COMSAT has announced that COMSAT and Environmental Research & Technology, Inc., (ERT) of Concord, Massachusetts, have mutually agreed to discontinue negotiations on acquisition of ERT by COMSAT. The parties were unable to agree on final terms.

COMSAT stated that it continues to have high regard for ERT and its management and looks forward to working with them in the future in areas of mutual interest.

United Way drive sets COMSAT record

Pledges and contributions by COMSAT employees to the recently concluded United Way Fund Campaign have topped all previous records, according to Mr. Richard S. Bodman, campaign Chairman.

Mr. Bodman reported this year's collections exceeded last year's total by $12,895 with 49 percent of COMSAT employees contributing. Employee contributions combined with Corporate matching funds realized a total of $67,778 for the United Way. Letters of appreciation were sent by Mr. Bodman to all participating employees.

COMSTAR nose cone washed ashore on Georgia beach

BY HALE MONTGOMERY

Shortly after midnight on September 26, a large, curved object was found washed ashore on the beach near a public bathhouse on Jekyll Island, Georgia. Viewers mistook it for a "flying saucer," and alerted a local radio station.

UFO rumors subsequently were stilled when a more sobering, rational explanation was offered: the mystery object probably was space debris.

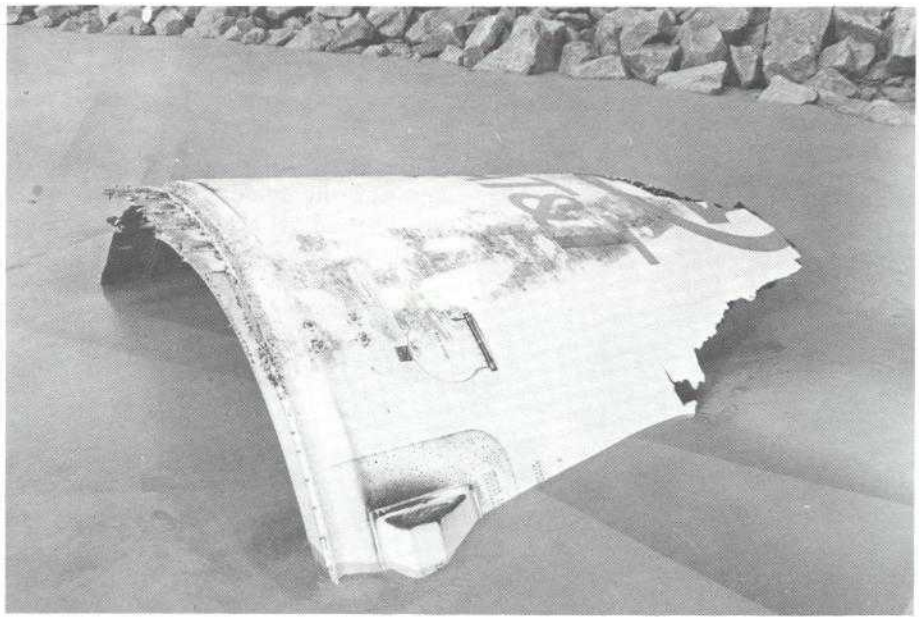
Sure enough, after telephone calls to NASA Cape Kennedy officials, to AT&T and to COMSAT GENERAL, the beach invader was identified as a chunk of the nose fairing from the launch vehicle for the COMSTAR D-3 satellite, launched from Cape Canaveral on June 29.

The cylindrical piece of fairing still clearly carried the AT&T markings and a piece of the AT&T Bell logo; other portions carrying the name COMSAT GENERAL had broken away.

Further suspicions allayed

But, according to local newspaper reports, an undercurrent of distrust still coursed through Jekyll Island. Questions arose. Was it radioactive? Did it carry an armed explosive bolt?

The COMSTAR D-3 assembly prior to launch.



Remainder of COMSTAR satellite nose cone washed ashore at Jekyll Island, Georgia.

It took the combined talents of COMSAT and COMSAT GENERAL engineers, NASA Lewis Research Center and Cape Kennedy Space Center officials, and personnel from General Dynamics (builders of the Atlas Centaur launch vehicle) to resolve all the questions after numerous domestic telephone calls (perhaps via COMSTAR D-3).

Serial numbers stamped on the fairings section confirmed it was from the COMSTAR D-3 launch vehicle. The debris, of course, was not radioactive. And a bomb squad from a Georgia Army base, summoned to disarm the suspected explosive bolt, was given assurances that the bolt was not active, that it had indeed detonated—by phone description it was only half the length of an armed bolt.

Larry Westerlund of COMSAT GENERAL and Allan McCaskill and Fred Ormsby from COMSAT'S launch vehicle team were among those involved in the sequence of telephonic detective events. Hale Montgomery of COMSAT GENERAL received the original story and inquiries from Southern Bell personnel on Jekyll Island.

3,060 Pounds of Nose Fairing

The debris that washed ashore to the alarm of Jekyll Island residents was part of the Atlas Centaur nose fairing that protects the satellite from thermal forces during the journey through the lower atmosphere. The entire fairing of cork and fiberglass, constructed in two large half-shells, is jettisoned by detonating explosive bolts. The two halves of the 30-foot long fairing weighed a combined total of 3,060 pounds.

The broken piece found on Jekyll Island was violently discarded from the streaking launch vehicle at an altitude of about 100 miles, some 290 miles downrange from Cape Canaveral, and it washed ashore in the night about three months after the launch.

(Continued on page 14)

Mr. Montgomery is Director, Business Promotion, COMSAT General.

IOD sponsors GW University graduate program at Plaza

BY STAN SCHACHNE

George Washington University is giving a course on telecommunications systems concepts at COMSAT Headquarters. The program is being offered here at the invitation of Richard Colino, General Manager of International Operations Division (IOD).

Richard R. Colino (left), Vice President and General Manager, International Operations Division, discusses in-house communications session with Dr. Ram Khatri, Adjunct Professor at George Washington University.

The course is one of the most popular in GW's program which leads to a Master's Degree in Telecommunications Operations and is generally known as "Communications Engineering for Non-Engineers."

Although the course is non-mathematical in nature, it attempts to give an appreciation of the basic concepts which are involved in a communications system. It thus serves to familiarize IOD personnel with the technical concepts underlying their daily business.

Topics of discussion include why a carrier is necessary in long distance communications systems, how noise is an unavoidable contaminant and how the modulation process puts information on a carrier. The nature of electromagnetic waves is discussed and also how a signal may exist in the time domain and in the frequency domain.

The hardware part of the course describes the functions of modulators, amplifiers, filters, transmitters, antennas, receivers and demodulators. The advantages and disadvantages of digital systems relative to analog systems are studied. In addition, the appropriate applications for microwave systems, cables and satellites are discussed.

The course meets on Wednesdays from 5:30 p.m. to 7:30 p.m. in the COMSAT Theater and 23 IOD staff members are enrolled.

Students may earn undergraduate or graduate credit at GW, depending on their academic status. Some IOD personnel are currently enrolled in the Telecommunications Operations program, and the in-house course eliminates the inconvenience of traveling to the school and provides access to classmates with whom some of these new concepts may be discussed.

For those who have not taken such courses, it is a way of getting introduced to the requirements of university courses.

The instructor, Dr. Ram Khatri, is well known at GW for his ability to present these very technical ideas in a manner that is understandable to students encountering them for the first time.

Mr. Colino intends to continue to sponsor in-house courses. A proposed offering will be an economics course that is intended to be relevant to IOD's work, as opposed to a more traditional academic type of economics course. The syllabus will include some basic accounting concepts, forecasting techniques, the time value of money and the use of discounted cash flow techniques in capital budgeting.

Mr. Schachne is a member of the staff of the International Operations Division.

NOSE CONE

(Continued from page 13)

According to launch experts here, space debris finds are not that unusual; many rocket pieces have fallen to earth. But how often, as reported in the *Savannah Morning News*, does a piece from space cause rumors of a "flying saucer invasion" in a peaceful coastal community?

At last report, the object had been carted off and thrown in a dump. But this saga may have a happier, more noble ending. Happily for COMSAT GENERAL, the COMSTAR D-3 satellite is in a synchronous orbit and producing $1.3 million in revenues per month. And, a Southern Bell Telephone technician said he may retrieve the "object" and convert it into noble use as a flower bed for flaming Georgia blooms.

15 years with Corporation

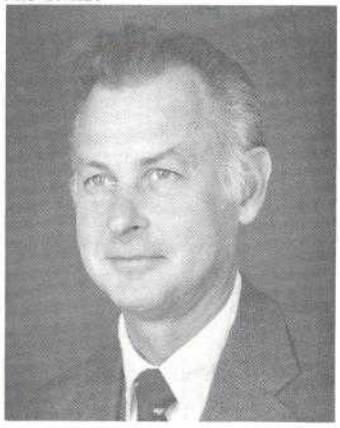
John A. Johnson
COMSAT General Chairman and Chief Executive Officer

Joseph V. Charyk
President
COMSAT

PHOTOS BY MIKE GLASBY

William L. Callaway
Director, Financial Planning and Control

Josephine P. Chapman
Administrative Secretary



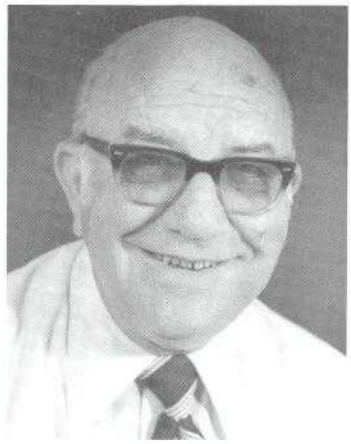
Louis D. Early
Manager
Program Development

Jeannette M. Loomis
Senior Executive Secretary

Sidney Metzger
Assistant Vice President and Chief Scientist

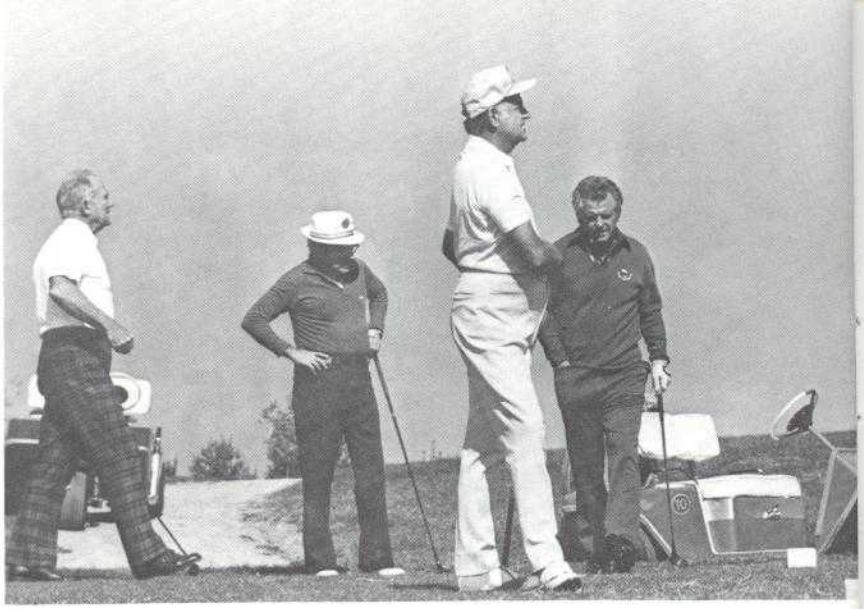
Lewis C. Meyer
Assistant Vice President
Procurement

James B. Potts
Assistant Vice President
Communications Operation



J. Ray Worthmiller
Contract Service Supervisor

The "19th hole" break



Teeing off

1978 Annual Golf Tournament

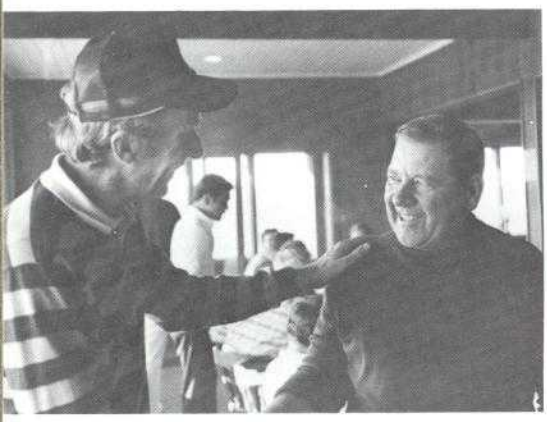
By Joe Donnelly

Comsat held its 1978 Fall Golf Tournament in October at Bretton Woods. About 50 golfers turned out for the competition. The big prize winners were: John Donohue, low gross (men); Pauline Luper, low gross (ladies); Andy Brunk, low net (men); and Pep Ruddiman, low net (ladies).

Other prize winners were Don Greer, second low net; Sandy Sanderson, third low net; Dr. Charyk, fourth low net; Jim Dunlop, fifth low net; Smith Rhodes, sixth low net; and Jim Hall, seventh low net. Marv Bowser won low gross and M. Kissam captured low net in the guest category.

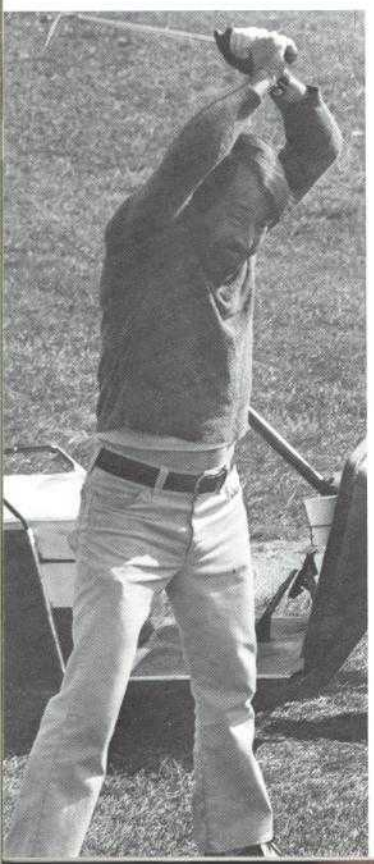
Dolores Anderson boomed the long drive for the ladies and Marv Bowser had the long drive for the men. Beezie Keebaugh was closest to the pin among the ladies and Lew Meyer for the men.

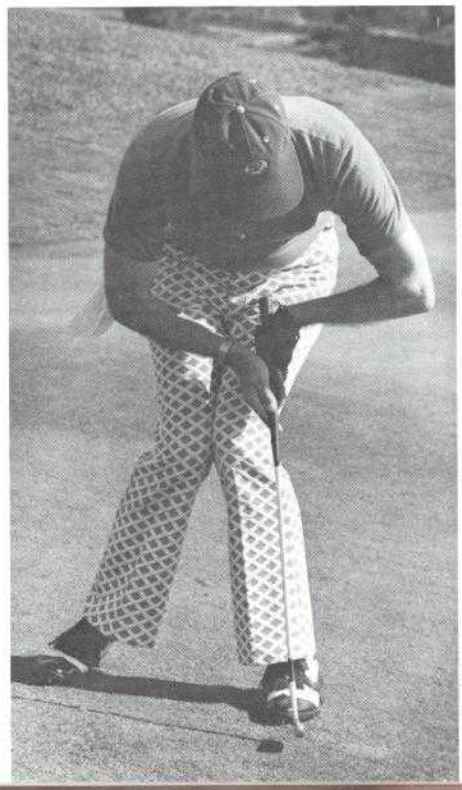
Since there's little that can be done with a photograph of a golfer (at least, little new), I thought for this tournament we would present a sampling of the candid shots taken during the tournament by Bill Megna of the Labs and let you, the reader, use your own imagination on the appropriate cutlines to accompany the pictures.



Joe Donnelly congratulates John Donohue

Photos by Bill Megna





Notes From Personnel

By Holly Pryatel

Because of the numerous requests received recently for information relative to the filing of medical and dental claims, we would like, in this issue, to briefly review some of the procedures which, if followed, will facilitate the servicing of employees' claims.

- All claims should be sent directly to the Lincoln National Life Insurance Company, not to the Personnel Department. Claim forms and mailing envelopes are available in the reception area of the Personnel Department at the Plaza, at Labs Personnel or from your local Administrator.
- Submit a claim form with the bill for each member of the family for each new illness or accident. You need not fill out a form each time you see a doctor for the same illness. If an illness extends into a new calendar year, submit a new form for the first visit in the new year.
- When submitting bills make sure they contain all the necessary information: name of patient, diagnosis, and COMSAT's Group number (G-19502). Incidentally, but importantly, Lincoln does not accept "balance due" bills—they must be itemized.
- Lincoln prefers that you file claims as soon as possible after bills are received. Ordinarily, claims will be processed within a week. If you expect to receive more than one bill within a short time period, submit them all at one time.
- You can have Lincoln pay the doctor directly or send payment to you as reimbursement. If you want Lincoln to pay the doctor directly, be sure to sign both parts of Section III of the dental form and Section II of the medical form.
- Another form you can use is the Pharmacist's Statement. If you take this to your drug store the pharmacist will note every time you buy a prescription drug. The pharmacist can use the store's own statement if that is the store's policy or you can save your receipts and send them to Lincoln. There is no need to send both, one is sufficient.
- Information concerning COMSAT's medical and dental insurance plans can be found in the "About Your Benefits" section of the *Employee Handbook*. If you have additional questions relating to claims you may call Plaza Personnel at (202) 554-6457; or call directly to Lincoln to Theresa Ardis, (202) 654-3910, extension 248, for Medical Claims, or Karen Barnhart, (202) 654-3910, extension 272, for Dental Claims.

Finally, the COMSAT Medical Plan has a special feature for deductibles at the end of the year called the "carry-over" provision. For details refer to page Medical/20 of your *Employee Handbook*.

Safety's Dougherty makes "Who's Who in American Women"

Nancy Dougherty, Manager of Safety and Health Services, has been selected for inclusion in the 11th edition of Marquis' *Who's Who in American Women*. Selection is based on a person's contribution to her career field as well as to society.

Ms. Dougherty is responsible for the Medical Units at the Plaza and Labs, and for Corporate-wide safety programs which include the annual inspection of all COMSAT/COMSAT GENERAL earth stations to ensure their compliance with Occupational Safety and Health standards. She was a speaker at the recent National Safety Congress, the annual convention of the National Safety Councils.

She is a Certified Hazard Control Manager, and is a member of the American Society of Safety Engineers, American Industrial Hygiene Association, and National Safety Management Society. She is on the Board of Directors and Executive Committee of the Virginia Safety Association, on the Curriculum Advisory Board of Northern Virginia Community College, and is a contributing editor to the *National Safety Management Journal*.

Network Bits

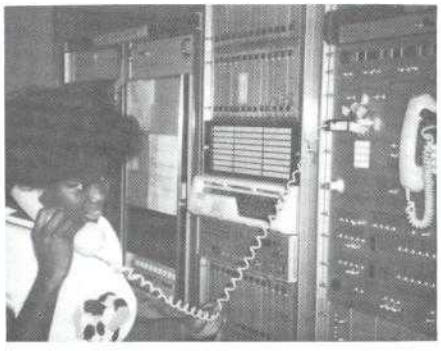
Field Correspondents

Andover
Joanne Witas
Brewster
Dorothy Buckingham
Cayey
Elfren V. Castro
Etam
Bev Conner
Jamesburg
C.B. Marshall
Labs
Norma Broughman
Joan Prince
Blaine Shatzer
M & S Center
Darleen Jones
New York
Stephen Keller
Paumalu
Bob Kumasaka
Plaza
Mary Lane
Santa Paula
Pat Hogan
Southbury
Eileen Jacobsen

ANDOVER. Congratulations to the COMSAT and AT&T Wives' Club for their support and involvement with the "41st Annual Rumford Community Hospital Fair" held recently at the Rumford Armory. As usual, the Club Raffle and Fair Booth was a vital part of the fund-raising program for the Rumford Hospital.

Prior to the Fair it was almost impossible for any of the local citizenry to escape being sold one or more raffle tickets by these dedicated workers.

Co-op student Angela Croom is a temporary employee assigned Andover for the TDMA field trial test.



The Children's Prize Booth was operated throughout the day and into the night by an enthusiastic group of volunteers. The working group consisted of **Betsy Belanger, Ginny Bragdon, Linda Clark, Andrea Conner, Sue Fields, Agnes Foster, Denise Foster, Kaye Gill, Gail Haseltine, Judy Kennedy, Joan Lepage, Judy Michaud, Betsy Mixer, Donna Morse, Norma Plantier, Cheryl Robichaud, Bertha Summerton, Liz Warren** and **Kathy Wood.** Not to be overlooked are the artistic contribution of **Chuck Lepage** and the strong and willing backs of **Bobby Richardson, Alan Stinson** and **Larry White.**

New station employees at Andover include **Al Robichaud** of Westbrook, married and father of two children; **Daniel Lambert** of Green, married with one child; and **Douglas Murray** who recently transferred, with his wife and two children, from Headquarters. **—Joanne Witas**

CAYEY. Several changes in station assignments were made here recently. After a long term as both Station Security Officer and PATHWAYS correspondent, **John J. Gonzalez** has been appointed Safety Chairman replacing **Otto R. Irizarry.** Station Manager **L. R. Rodriguez** expressed his personal appreciation to both for their excellent work. **Luis Medina** and **Elfren V. Castro** were appointed Security Officer and magazine correspondent respectively.

Headquarters' **C. Padgett** made a recent visit to the station to monitor the air conditioner chiller installation. We would also like to give a tardy "welcome" to Junior Technician Luis C. Ruiz who joined our staff last June.

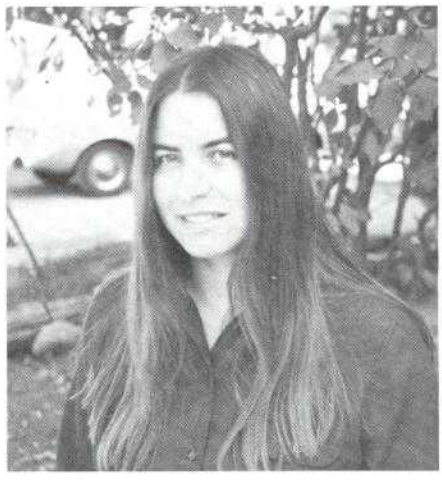
On behalf of our personnel here at Cayey I would like to extend the Seasons Greetings to all of the members of COMSAT, COMSAT GENERAL and INTELSAT and their families.

—Elfren V. Castro

JAMESBURG. Under the supervision and direction of Facilities Engineer **W. D. Robinson,** dependents of station employees have been undergoing CBR and/or Multi-Media First Aid Training. Pictured below in one of the training classes are, left to right, **Kelly** and **John Blatnik,** daughter and son of **Patricia (Patty) Blatnick,** Jamesburg's Secretary and Personnel Clerk; **Sylvia DeShong,** wife of **Paul DeShong,** Team "A" Supervisor; **Francetta Marshall,** wife of **Cambrel Marshall,** Material Control Specialist and Accounts Clerk; **Sheala DeShong,** daughter of **Paul DeShong;** and **Jeannie Robinson,** wife of **Walter D. Robinson.** Marshall's daughter **Juanda,** also a member of the class, was not available at the time the photo was taken.

First Aid training class

In California, where forest fires are a constant threat, considerable dependence is placed on volunteer support. In the front ranks of these volunteers is **Cheryl Treganza** (accompanying photo), wife of **Marco A. Treganza,** Team "A" Electronic Technician. **Cheryl** was the first



female firefighter of the 15-member Cachagua Fire Company. She also serves as its secretary.

The team came into being in the aftermath of last fall's Marble-Cone forest fire. The team serves the 10-mile long Cachagua Valley in which more than 300 people reside. The team has two certified emergency medical technicians with emergency equipment and is capable of responding to an emergency call within five minutes. Members of the team receive weekly training from California Forestry Department personnel.

—C. B. Marshall

M&S CENTER. Our congratulations to **Mike Roberts** and **Kathy Wilson** on their recent marriage. They are making their home in Manassas, Virginia. **Lee Bolinger** recently received his Ten-Year Service Award. **Jim Silvius** attended the Fourth International Conference on Digital Satellite Communications in Montreal, Canada.

George and **Ellen Robertson,** with daughters **Kate** and **Jane,** spent a happy and busy vacation in Great Britain visiting George's family in St. Andrews and renewing "auld" acquaintances. Their touring included the borders and east coast regions of Scotland. Their final week was spent in London and was highlighted by a visit to the Royal Mews and a day at Hampton.

Barbara and **Hugh Hutchens** recently vacationed for two weeks in Hawaii. One of the highlights of their trip was the tour of Oahu conducted by **Bob Makizura** of the Paumalu Station and his family. Other Islands visited were Kaui, Maui and Hawaii. Anyone interested in seeing **Barb's** interpretation of the "hula" can stop by the M&S Center.

Hank Shutzbier was guest of honor at a luncheon prior to his transfer to MCE in Gaithersburg.

—Darleen Jones

PAUMALU. Visitors to the Paumalu Earth Station are now greeted by a closed circuit TV camera, a call button, an intercom, a sliding gate, and some printed instructions. Conspicuously absent is the security guard who formerly stood watch at the entrance, screening and greeting visitors to the station.

The surveillance system at the main gate provides a means for surveying and controlling the entry and exit of persons or vehicles through the main entrance, on a 24-hour basis, without a security guard. Guard services, provided for 12 years by Hawaii Protective Association at Paumalu, have been terminated. The main control of the surveillance system is located in the Control Building and it is from there that station personnel now operate the system.

Operations Supervisor Stanley Holt (photo above) controls access to and from Paumalu (photo below) by controls and TV monitor in the Control Console Room.

The security fence, consisting of an eight-foot high, chain link fence, crowned with barbed wire, surrounds the immediate area of the Paumalu and neighboring GSAT Earth Stations. Over a mile of chain link fence was required for the project.

Paumalu employees' generosity was again displayed during the recently conducted Aloha United Way campaign. A total of $3,269 was contributed by 27 employees for an average contribution of $121.08 per donor. The local United Way Fund supports 57 agencies carrying on the basic human care services in the community. William B. Carroll, Assistant General Manager, U.S. Communications System was a recent visitor to Paumalu. **—Bob Kumasaka**

PLAZA. Congratulations to **Jim** and **Cathy Castellan** on the birth of their first child, **Michael Patrick,** weight seven pounds, four ounces. Congratulations also to **Leeland** and **Judy Kehl** on the birth of seven-pound, six-and-one-half-ounce daughter **Tami Renee.**

We are happy to report that Personnel's **Bob Dahlgren** has returned to work after surgery and a period of recuperation. Graphics' **Rock Mattos** is also now back at his desk following a period of hospitalization and recuperation. **—Mary Lane**

LABS. Pep Ruddiman was honored by the Gaithersburg Business and Professional Women's Club recently during National Business Women's Week. In the submission letter Pep was cited by **Lyn Russell,** Director of Administration, as "a woman who holds a position which makes a definite contribution to the success of the Laboratories and who has increased the value of the position over the past through her own personal efforts and abilities."

Paulette Luper is in training as an emergency medical technician with the Montgomery Village Fire Department. **Ken Pease** is also a member. **Gert Van Ommering** of the Applied Sciences Laboratory has been awarded the COMSAT Labs Research Award for his contribution "in the research and engineering work . . . which led

to the invention and development of the nickel-hydrogen battery."

Barbara Wax, wife of the Computer Center's **Sam Wax,** has been admitted to the Bar of the State of Maryland. **Carol Reiger** is now a temporary consultant. **John Austin** has transferred to INTELSAT. **Jim Simpson** visited Teldix to observe the thermal cycling and functional tests on the qualification model wheels QM1 and QM2.

Chet Pentlicki observed vibration tests of the rate gyro package for the INTELSAT V at Honeywell. **Andy Zvilna** has transferred from the Plaza to Spacecraft Labs. **Paul Schrantz** attended an INTELSAT V review in france. **John Hsing** spent two weeks vacationing with his family in Taiwan. The **Jack Allisons** took a four-week trip through the west. Jack denies "losing his shirt" at Las Vegas but admits to being disappointed at not being able to see his favorite Dolly Parton who was unable to make an appearance in Nashville.

The **Carol Haughs** announced the arrival of daughter **Jessi**—weight ten pounds, nine ounces. **Al Ramos** and wife have a new son, **Alberto David Ramos,** who at last report, weighed five-and-one-half pounds. The **Jim Castellans** also have a new baby boy. **Jim McGill** broke a leg in two places learning to ride a motorcycle. He's now back at work—crutches and all. **Bud Bell**'s accident kept him out of the COMSAT Gold Tournament.

Our appreciation to Lab's Facilities who have cleared up the problems left by the swarms of starlings, blackbirds and grackles who took up residence in the woods adjoining the Labs. The clearing process was the result of the combined efforts of the Facilities, the Gaithersburg Extension Service and local police. Our Facilities people also chased from the premises a herd of local steers who were about to lunch on COMSAT's garden. **Blaine Shatzer** learned the hard way that you can only pile so much firewood on a truck. It took a tractor and the assistance of **Curtis Carter, Steve Beall** and **Howard Hanes** to pull him out of the mud.

Receiving Patent Incentive Awards recently were **William Baker, Kenneth Stuart, William English, Russell Fang, Paul Fleming, Thane Smith, Nelson Jacobus, George Meadows, Vasil Uzunoglu** and **Chester Wolejsza.**

New employees at the Labs include **Neal Becker, Davis Simmons, Cathy Williams, Brenda Reynolds, Daniel Lieberman, Betty Morris, William Hoblit, Minnie Coleman, Roger Glenn, Helen Neal, Bonnie Logue, Britt Orrison, Gladys Woods** and **Nath Srinivas.** Terminating employment were **Yvette Viviani** and **John Austin.**

—B.P.S.

A few words about the CEA

BY ANNE SPEARE

The COMSAT Employees Association was originally created to bring the corporation's employees together through recreational and social activities. Since then it has grown to encompass not only the recreational and social activities but to provide services, informational needs, and financially assist clubs and athletic programs created by interested employees. Representatives, elected by you, meet the challenge of organizing and maintaining these functions throughout the year.

Recently it has come to the attention of your representatives that the association's members may not be familiar with some of the different activities provided. In an attempt to let you know what is available we have provided a summary below of some of the many activities available.

The Annual Picnic, Children's Christmas Party, and the Christmas Dinner Dance are the three major productions of the association during the year. The Picnic, held each year in June, has proved to be an excellent family outing. The Children's Christmas Party, held in the middle of December, is enjoyed by children of all ages. Cartoons, magical acts, and the arrival of Santa Claus create an exciting afternoon for all involved. The Christmas Dinner Dance is a very special evening in that it brings the employees and their spouses together to be with close friends, renew old acquaintances, and have the opportunity of meeting with their colleagues.

Discount prices are available to CEA members for Busch Gardens, Kings Dominion, Magic Kingdom and Tourmobile tickets. The ABCD Buyers Guide provides 10-30 percent discounts on items such as restaurants, appliances, jewelry, and furniture just to name a few. Nationwide has also provided us with a booklet offering discounts on tires and car care services. Fenton glassware, COMSAT patches and Christmas gift wrap are also made available to you during the year.

The various clubs include Art Appreciation, Auto, Boat, Chess, Garden, Homeowners, Motorcycle, Music Appreciation, Radio and Ski clubs. Basketball, softball, tennis, golf tournaments, and volleyball make up the athletics program. Notification of these programs are continuously distributed to you so that you may join in one or all of them. These clubs and programs were created by employees who discovered that fellow employees enjoyed the same interests. Each of these clubs provides you with an avenue to explore, an opportunity to meet other employees who share the same interests, and helps to satisfy some of your personal needs.

All of these activities are open to COMSAT and COMSAT GENERAL employees. Your CEA representatives will be happy to assist you in any way possible and we are always open to your recommendations regarding the creation of new or additional activities.