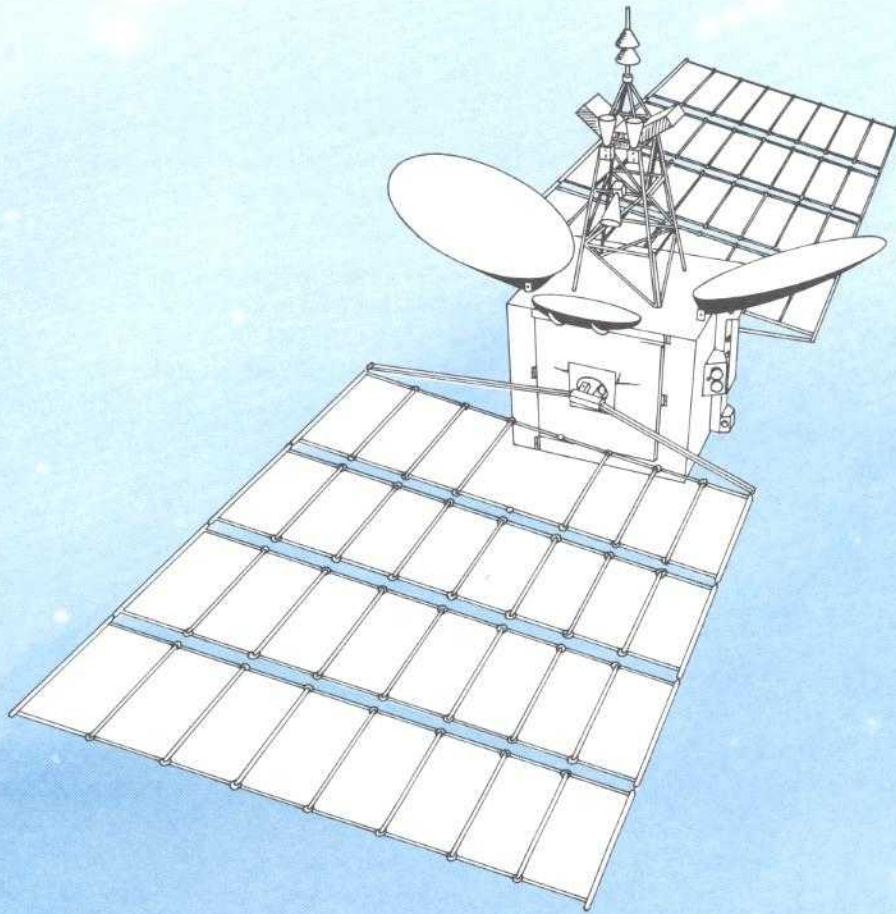


January-February 1979
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Pathways

SATELLITE



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Cover. An illustration of the Solar Array—
Ultra Light Panel—configured to an Ariane
satellite.

MARISAT
Public communications
expanded

COMSTAR
Third satellite up

INMARSAT
Legislation passed

THE VOLUME of COMSAT's services through the INTELSAT global system continues to grow. As of December 31, 1978, the Corporation was leasing 6,623 half-circuits to its customers for full-time satellite services through the INTELSAT system, an increase of 25 percent from the 5,315 half-circuits leased by COMSAT at the end of 1977. The number of full-time half-circuits leased by INTELSAT to all users of the system totaled 25,286 at the end of 1978, an increase of 25 percent during the year.

In August 1978, COMSAT put into effect sharply reduced rates for the satellite channels it provides for international voice, data and video services. Although COMSAT had reduced its rates for satellite channels several times since commercial service was first introduced in 1965, the 1978 rate reduction—an overall decrease of approximately 48 percent—represented the largest such reduction in the history of U.S. international communications. The lower rates resulted from settlement with the FCC of the case concerning the Corporation's charges for its INTELSAT system services, as well as from increases in international satellite traffic and lower satellite unit costs flowing from technological gains.

Looking back at '78

**COMSAT's international services:
volume up, rates down**

International Television: More Use; Direct Service Approved

COMSAT's television services in 1978 totaled approximately 2,781 half-channel hours, 1,115 more than in 1977.

On October 5, 1978, the FCC voted unanimously to allow users of international television services to choose to obtain those services directly from COMSAT at U.S. earth stations rather than indirectly from COMSAT through its carrier customers. Two of the carriers have filed petitions for review of the decision.

The FCC had ruled in 1966 that COMSAT should serve primarily as a "carrier's carrier" and that entities other than authorized common carriers should not be permitted to acquire services directly from COMSAT except in unusual or unique circumstances. Although the October ruling is not likely to have a significant impact on the Corporation's total revenues in the foreseeable future (COMSAT's television services account for less than two percent of its total revenues), the ruling does confirm that COMSAT is not necessarily restricted to a carrier's carrier role.

Growth Continues in Temporary and Digital Services

The temporary services COMSAT provides through the INTELSAT system, such as to restore service during trans-oceanic cable outages and to handle holiday traffic and special events, increased from 9,298 half-circuit days in 1977 to 9,824 half-circuit days in 1978.

In 1978, COMSAT continued to provide a variety of digital services for the transmission of telephone, data and facsimile communications. These offerings include high-speed digital data channels for international satellite communications, a combined low/medium/high-speed digital data service, DIGISAT, and a digital telephone service, SPADE, that allows access to the INTELSAT system on an as-needed basis. As of December 31, 1978, COMSAT was offering SPADE for communications with more than 30 countries in the Atlantic Ocean region.

Last IV-As In Service; Work on Vs Goes Forward

In 1978, the last two satellites in the INTELSAT IV-A series went into service.

In mid-November, the satellite launched in March became the Primary satellite in the Indian Ocean region, and the satellite launched in January 1978 began service as a spare in the same region.

During 1978, work progressed on the INTELSAT V series of satellites, under construction by Ford Aerospace and Communications Corporation. The first of the seven satellites in the series is scheduled for launch during the latter part of 1979.

In November 1978, the FCC authorized COMSAT to construct at the Etam, West Virginia, earth station an antenna to operate in the 11- and 14-gigahertz frequency bands with the INTELSAT V satellites. COMSAT

has also asked the FCC for authority to construct a similar antenna at Lenox, West Virginia, and a terrestrial link to connect this antenna with the one at Etam. The alternate antenna sites are needed to ensure continuity of service, because rain can interfere with signals transmitted at the 11/14-GHz frequencies.

COMSAT started construction of new TTC&M antennas at the Andover and Paumalu earth stations, and also began work under the INTELSAT V Communications System Monitoring Program. This program involves the design, construction and installation of equipment to monitor the performance of signals sent through the INTELSAT V satellites.

Earth Segment of INTELSAT System Grows

The worldwide network of earth stations was expanded in 1978 by the addition of 36 antennas and 34 earth station sites. At the end of 1978, there were 237 antennas at 197 station sites in 96 countries. Of this total, 157 antennas at 131 station sites were being used for international communications services. The remaining station facilities were being used for domestic or specialized services through capacity leased in INTELSAT system satellites.

EARTH STATIONS IN THE INTELSAT SYSTEM As of December 31

	Antennas	Stations	Countries
1965	5	5	5
1966	8	8	6
1967	15	14	11
1968	20	19	13
1969	41	36	24
1970	51	43	30
1971	63	52	39
1972	79	65	49
1973	85	68	52
1974	104	83	60
1975	123	97	71
1976	157	126	82
1977	201	163	88
1978	237	197	96

ANNUAL INCREASE IN EARTH STATIONS

	Antennas	Stations	Countries
1965	5	5	5
1966	3	3	1
1967	7	6	5
1968	5	5	2
1969	21	17	11
1970	10	7	6
1971	12	9	9
1972	16	13	10
1973	6	3	3
1974	19	15	8
1975	19	14	11
1976	34	29	11
1977	44	37	6
1978	36	34	8

As of December 31, 1978, there were 639 satellite pathways in the INTELSAT system, an increase of 80 during 1978.

COMSAT signed an agreement in June 1978 to construct and operate an earth station at Tutuila, American Samoa, that would serve the Government of American Samoa (GAS). COMSAT will have complete ownership of the earth station, which will become part of the INTELSAT system. GAS will connect the existing ground communications network to the earth station and provide services to Samoan users. The station, scheduled to begin service in late 1979, will communicate initially with Hawaii and the U.S. mainland. Service to other Pacific points will follow.

Management Functions Transferred; New Contracts Take Effect

Membership in INTELSAT grew to 102 countries when Fiji became a Signatory in May 1978. COMSAT's investment share as of March 1, 1978, was 25.11 percent—22.19 percent for proportionate use and 2.92 for additional shares assumed by the Corporation.

COMSAT's Management Services Contract with INTELSAT expired on December 31, 1978. All operational tasks, except certain specialized tasks and technical functions, are now performed by INTELSAT's own staff. The specialized tasks and technical functions are carried out by COMSAT for INTELSAT's Director General under two technical service contracts and a laboratory services contract.

During 1978, INTELSAT assumed full ownership and control of the Operations Center and INTELSAT Spacecraft Technical Control Center. COMSAT had been providing both of these facilities to INTELSAT under contract. COMSAT plans to establish its own separate launch control center at Plaza Headquarters.

Third COMSTAR Begins Service



ANTENNAS BY SATELLITE REGIONS

As of December 31

	ATLANTIC OCEAN	PACIFIC OCEAN	INDIAN OCEAN
1965	5		
1966	6	2	
1967	8	7	
1968	11	9	
1969	22	12	7
1970	25	14	12
1971	30	16	17
1972	40	19	20
1973	45	19	21
1974	58	19	27
1975	66	22	35
1976	76	24	57
1977	128	26	47
1978	166	49	22

The third satellite in the COMSTAR series was launched in June 1978. Its communications capacity was made available to AT&T on September 7. As in the case of the first two COMSTAR satellites, both placed in service in 1976, the capacity of the third satellite has been leased to AT&T for seven years. The COMSTAR satellites are used to provide U.S. domestic communications services.

MARISAT Service Fully Global; Legislation Signed

Virtually complete global coverage for commercial maritime communications satellite customers through the MARISAT system, managed by COMSAT GENERAL, was achieved on November 17, 1978. Commercial service throughout the Indian Ocean region was initiated through an earth station at Yamaguchi, Japan, operated by Kokusai Denshin Denwa Co., Ltd., the Japanese international telecommunications carrier. This facility is the first shore station for commercial MARISAT communications established outside the U.S. The MARISAT joint venture is leasing satellite capacity to KDD for the provision of MARISAT services in the Indian Ocean region.

As of the end of 1978, 166 commercial ship and offshore oil and gas drilling facilities were equipped with MARISAT terminals, 74 more than at the end of 1977.

In late 1978, the Congress passed and the President signed into law the International Maritime Satellite Telecommunications Act. The Act designates COMSAT as the sole operating entity of the United States for participation in the proposed International Maritime Satellite Organization—INMARSAT. Patterned along the lines of INTELSAT, INMARSAT would develop and operate a global maritime communications satellite

system. The Act provides, among other things, for the ownership and operation by COMSAT of the U.S. share of the satellites and related facilities of the INMARSAT system.

COMSAT signed the INMARSAT Operating Agreement on January 10, 1979. The Operating Agreement is one of two agreements that countries accounting for at least 95 percent of the total initial investment shares in INMARSAT must sign to bring INMARSAT into existence. It is expected that the new organization will come into being by mid-1979.

MARISAT SHIP TERMINALS As of December 31*

1976	34
1977	92
1978	166

*Commercial service began in the Atlantic Region 7/76, in the Pacific Region 8/76, and in the Indian Region 11/78.

Satellite Business Systems: Building For the 1980s

Since February 1977, when the FCC authorized Satellite Business Systems (SBS) to proceed with construction of domestic communications satellite facilities, SBS has been making substantial progress toward the establishment of its system. In January 1978, SBS awarded a \$63 million contract to Hughes Aircraft Company for the manufacture of three satellites. Plans call for the launch of the first of these satellites in 1980 and the beginning of full commercial operation in 1981. SBS has been carrying out a pre-operational program to test its proposed services, and has coordinated an experiment to demonstrate how satellites and advanced business equipment can be used to meet intra-company communications requirements.

On August 29, 1978, a three-judge panel of the U.S. Court of

Appeals for the District of Columbia Circuit decided to reverse the FCC's February 1977 SBS authorization and to return the matter to the FCC for further consideration on whether joint entry in the domestic communications field by COMSAT and IBM through SBS would violate the antitrust laws. Since the Court of Appeals panel was concerned solely with the joint participation by COMSAT and IBM and not with the FCC's findings that the SBS services would be in the public interest, SBS is continuing to proceed with work toward the establishment of its system while both it and the FCC seek review of the panel's decision.

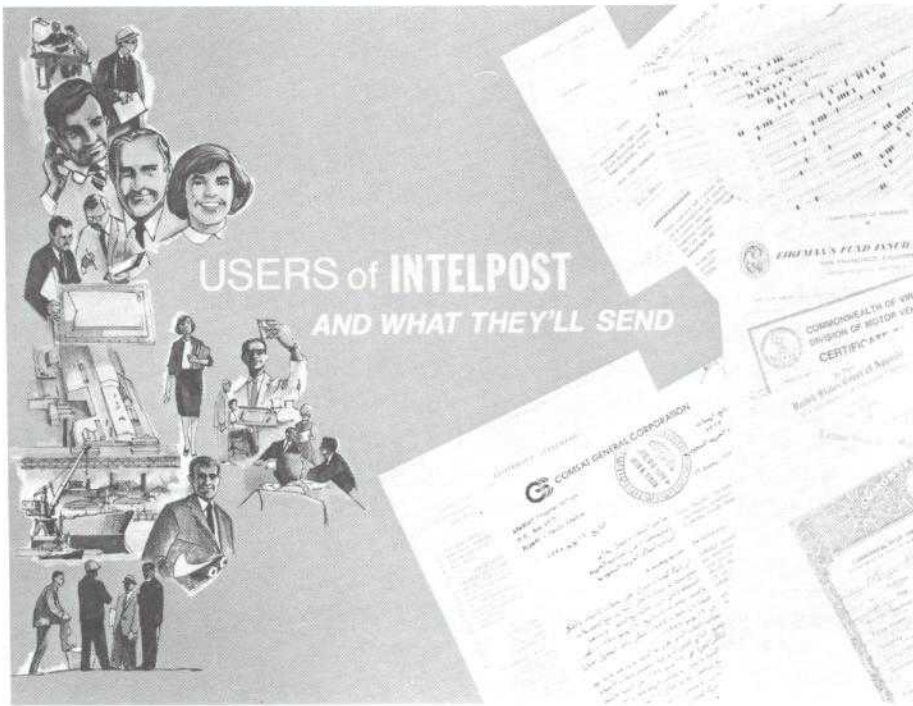
Technical Services Increase; New Programs Explored

On April 15, 1978, COMSAT GENERAL entered into a contract with the Arab Satellite Communications Organization to provide consulting services in connection with the establishment of an Arab regional satellite system. Also in 1978, COMSAT GENERAL provided assistance to the Government of India in connection with the procurement of satellites to be used in an Indian satellite system.

In March 1978, COMSAT signed a contract to assist the U.S. Postal Service in developing and demonstrating an international electronic mail system, known as INTELPOST, and in planning a possible one-year field trial of a pilot system. The demonstration of the system is scheduled for spring 1979.

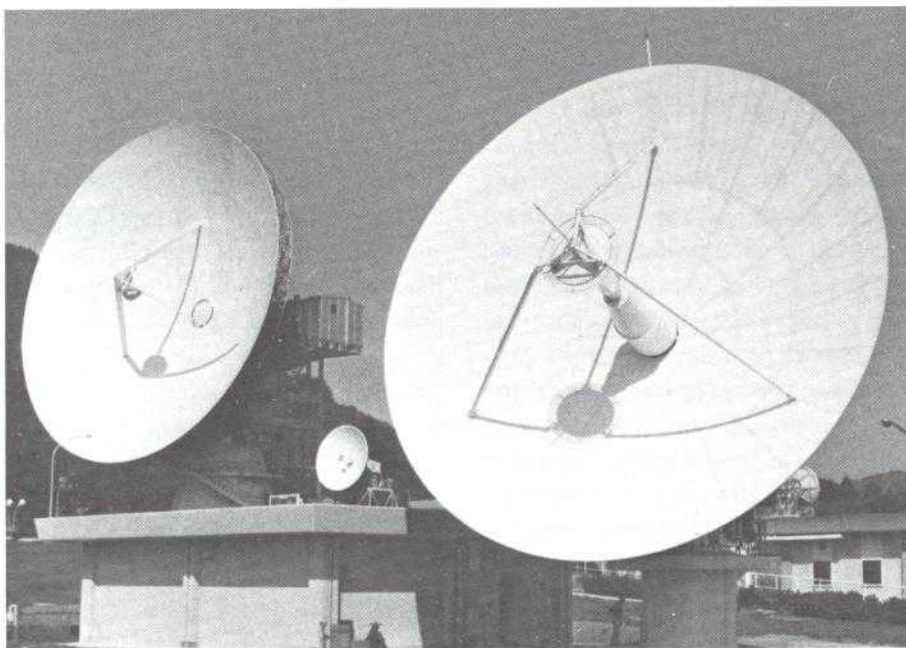
In June 1978, COMSAT GENERAL concluded a developmental program with the U.S. Geological Survey (USGS) and TELESAT Canada demonstrating the capability of satellites and small unattended earth stations to collect water resources monitor-

(Concluded on next page)

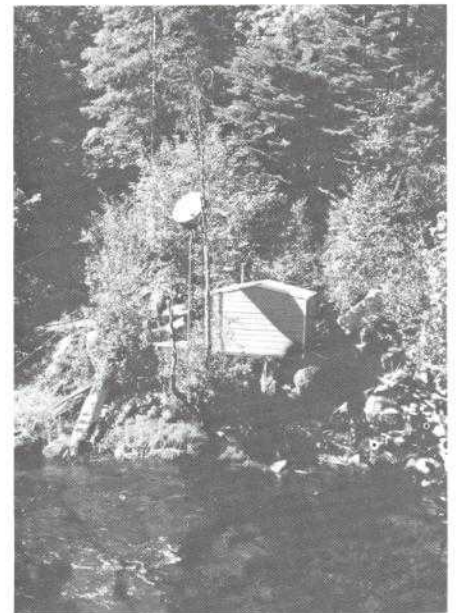


In early 1978, COMSAT signed a contract with the U.S. Postal Service to assist it in developing and demonstrating an international electronic mail system known as INTELPOST.

With the introduction of commercial service throughout the Indian Ocean Region via an earth station at Yamaguchi, Japan, MARISAT provides virtually complete global coverage for commercial maritime satellite customers.



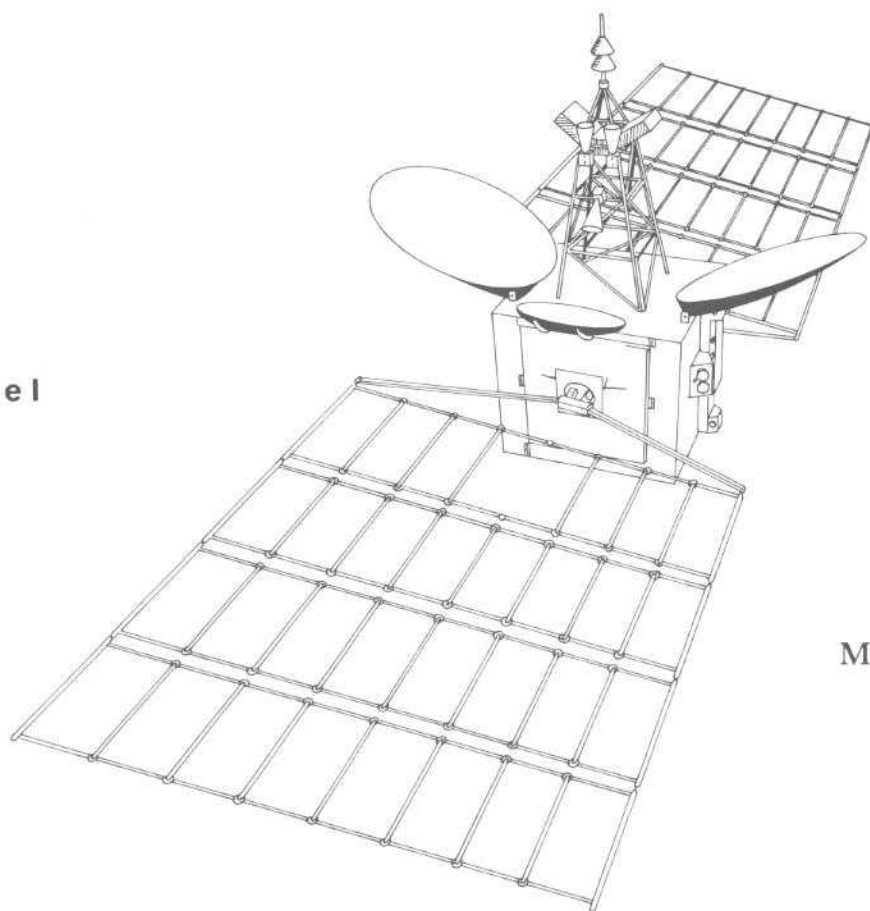
ing data from remote areas. From COMSAT GENERAL's small antennas adjacent to USGS monitoring sites, data was transmitted via a TELESAT satellite to COMSAT GENERAL's Southbury, Connecticut, earth station where it was distributed terrestrially to USGS offices. After the conclusion of the joint developmental program, the first use of commercial satellite facilities for day-to-day collection of environmental data from remote locations, COMSAT



Data Collection Platforms used to record stream levels and water quality data for the U.S. Geological Survey.

GENERAL began negotiations with USGS on a proposed pilot program under which COMSAT GENERAL would deliver to USGS hydrological information from data collected at more than 100 monitoring sites. 🌐

Ultra
Light
Panel



COMSAT

Laboratories

Tests new Solar

Array which promises

More power for satellites

SUSPENDED FROM AN OVERHEAD track in the cavernous COMSAT Labs ETL (Environmental Testing Laboratory) hangs an 11-foot tall, 21-foot long, 73-pound prototype of a "solar array" which promises to produce power from the sun's rays more efficiently for future generations of communications satellites.

This solar array, using an ultra-light panel (known as the ULP), is the result of a program of research and development sponsored jointly by INTELSAT and the National German Space Agency (DFLR/BPT), beginning in 1976. Prime contractor for the program is Messerschmitt-Bölkow-Blohm GmbH, with AEG-Telefunken as the subcontractor for the solar cells and the "blanket" on which they are mounted.

Dr. Curtin is Assistant Manager, Electric Power Department, Spacecraft Laboratory, COMSAT Labs.

BY DR. DENIS C. CURTIN
AND EDGAR BOLEN

The basic aim of the program was to give satellite designers the option of increasing performance capability of a satellite without increasing its weight, or to produce a lighter satellite without sacrificing its performance.

The present prototype should produce 30 watts per kilogram, or 68 percent more than is expected from the array on the INTELSAT V satellite now under construction.

This new solar array would be one of two "wings" to be zig-zag folded against the spacecraft for launching and maneuvering into orbit and then deployed at an earth signal to expose their full surface to the sun's rays. It will still be producing slightly more than a kilowatt of power from each wing at the end of seven years in a geosynchronous orbit.

Each panel consists of a frame of carbon fiber/Kapton 25 mm (one inch) thick, holding a pretensioned blanket of carbon fiber/Kapton laminate to which the solar cells are affixed. The blanket with the cells is less than 0.4 mm thick (about a fiftieth of an inch). The solar array wing consists of a yoke and four panels; the yoke and panel nearest to the satellite are empty to avoid the satellite's shadow falling on the solar cells. When folded for launch the "package" is roughly one meter by 3.3 meters, or three by eleven feet, and 15 centimeters (six inches) thick. These dimensions will fit on a conventional launch vehicle or into the cargo space of the NASA Space Shuttle.

When the satellite is in proper orbit a signal from the ground fires

Mr. Bolen is in the COMSAT Office of Public Information.



The ULP Test Array, on arrival at the Labs, is placed on a special dolly for transport to the test site.



The dolly is designed to tilt the folded solar panels into upright position for hanging on the test track. Light reflections from protective plastic show location of active solar cells.

a small pyrotechnic charge, which drives a hatchet-like blade against a cable, cutting it and releasing the hold-down mechanisms which keep the panels flat against the satellite; the spring hinges joining the panels then open them out, deploying the array in about seven seconds. While the wing is still folded, the solar cells in the outside panel generate enough current to power the satellite during its time in transfer orbit.

Deployed solar arrays have not been employed on INTELSAT satellites in the past, although other satellites have used them. INTELSAT's first four generations of satellites have been "spin stabilized" (kept in the same attitude toward the earth by a rotating drum covered with solar cells, which acts as a gyroscope).

In contrast, INTELSAT V and many future satellites will be stabilized by momentum wheels spinning inside the satellite, much as ocean liners are steadied today. These satellites will utilize deployed solar arrays.

For this type of satellite, the ULP offers several advantages. Prominent among these is the fact that its very light weight and modular construction—it can be designed with more or fewer panels—enable it to be used to generate power in a range from one to ten kilowatts.

Use of carbon fiber/Kapton laminate in the cell blanket also has advantages. During the twice-yearly "eclipse periods"—the times around

March 21 and September 21 when the satellite is in the earth's shadow for brief periods each day—the array will cool rapidly for as much as 72 minutes and then rapidly warm up again. As it cools it shrinks, as it warms it expands, and the carbon fiber in the frame does not expand and contract at the same rate as the glass fiber/Kapton which has been used for the cell blanket in some earlier arrays. This could overstress the frame and cause it to break. Making frame and blanket of the same material avoids this problem.

In addition, use of the carbon fiber/Kapton for the blanket eliminates build-up of electrical charge on the array.

The test array at the Labs has most of the blanket surface covered with aluminum dummy cells—one panel carries 756 active solar cells; in operation each panel can carry 3,600 active cells, or a total of 10,800 cells per wing.

Before being shipped to this country the array had been tested extensively for reaction to extreme temperatures (from -180°C to $+70^{\circ}\text{C}$, which is from -290°F to $+158^{\circ}\text{F}$), subjected to various types of vibration, and its deployment tested in both in air and in vacuum.

At the Labs other tests will be conducted, such as determining the natural frequency of the blanket, but it is considered that, as now designed, this new array is virtually ready to be configured for a satellite.

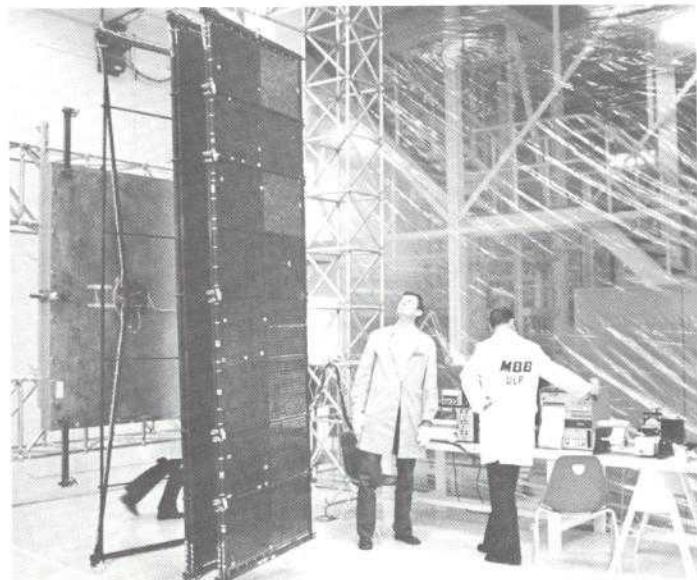
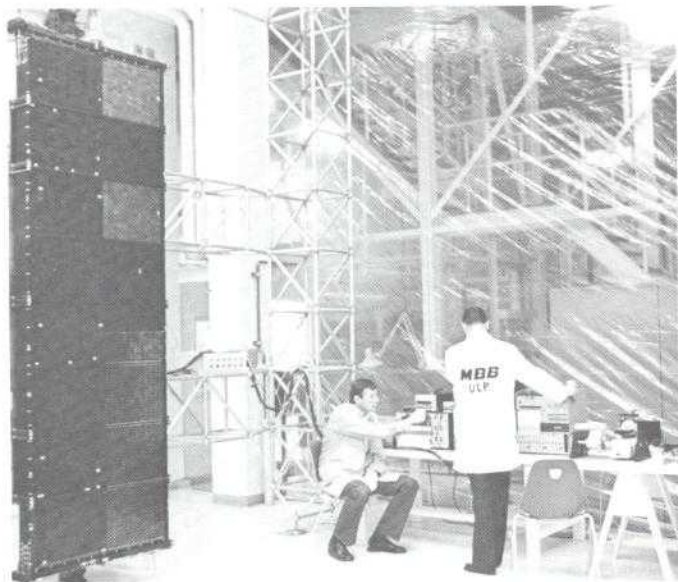
On the track, the array is given a final check by Labs technicians and those from the German firm which produced the array.



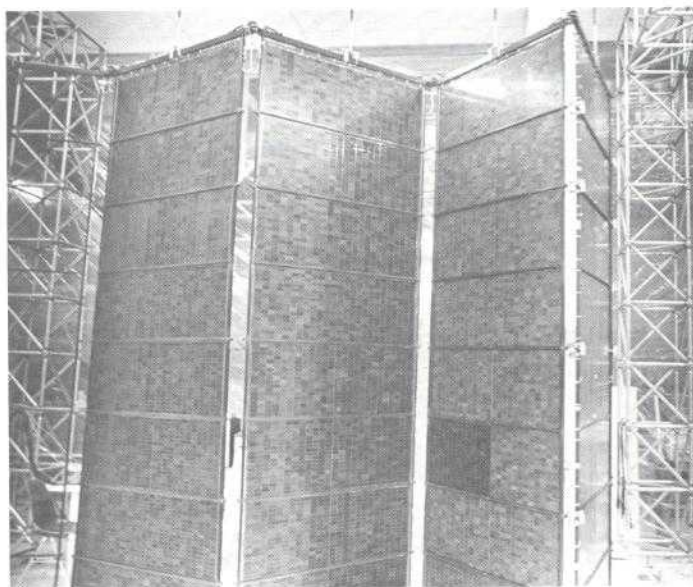
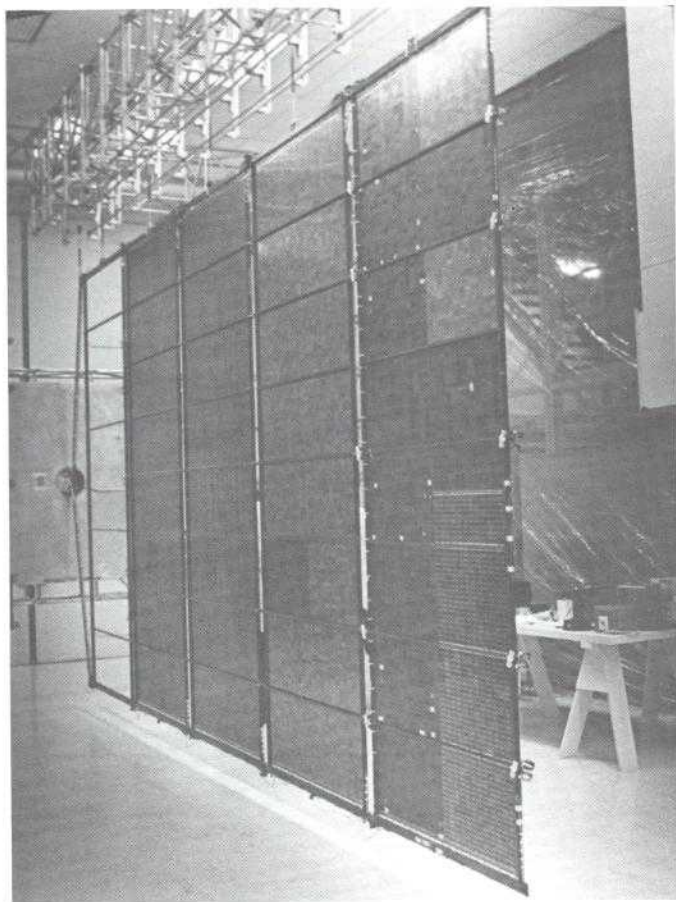
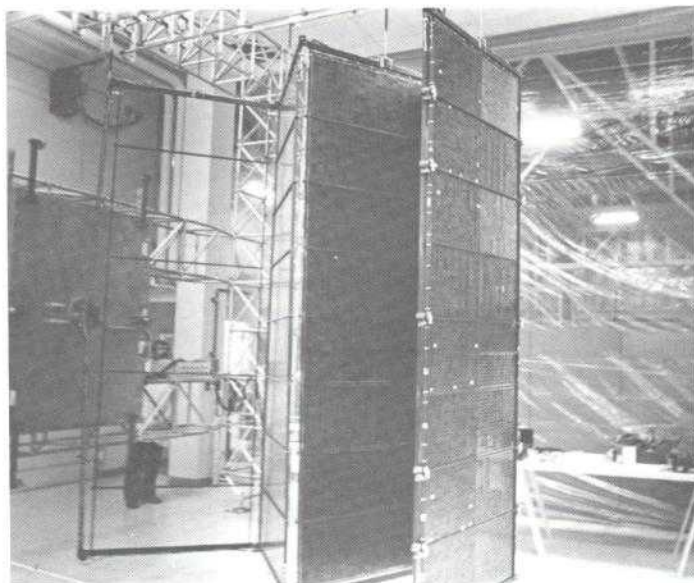
After last-minute adjustments are made, everything is pronounced ready for the test.



PHOTOS BY BILL MEGNA

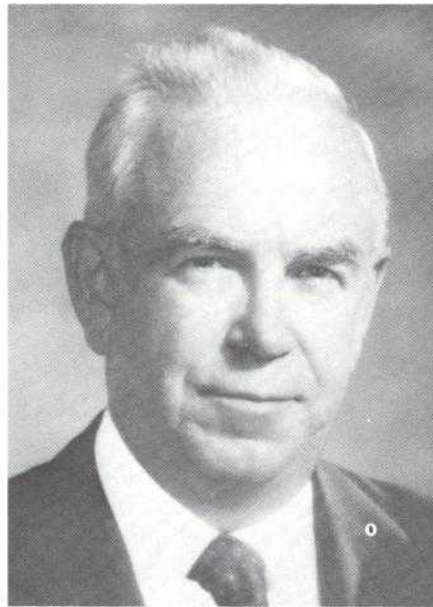


(Clockwise from upper left) The electronic signal is given; the pyrotechnic device's tiny "guillotine" cuts the cable and releases the hold-down mechanism; the panels begin to open like an oversized folding door; the empty frame, which holds the solar cells out of the shadow of the satellite, becomes visible; the array opens smoothly, until, about seven seconds after the signal, it is in full operating position.





*Joseph V. Charyk
Elected President
and Chief Executive Officer*



*John D. Harper
COMSAT Director
Elected Vice Chairman*



*Joseph H. McConnell
Board Chairman
Announces plan to step down*

At its recent meeting the COMSAT Board of Directors elected COMSAT President Joseph V. Charyk President and Chief Executive Officer and John D. Harper Vice Chairman of the Board.

Chairman of the Board Joseph H. McConnell informed the Board of his intention to continue as Chairman until the Annual Meeting of Shareholders in May, at which time he plans to retire from the Chairmanship.

Dr. Charyk has held the positions of President and COMSAT Director since the Company's incorporation in the District of Columbia in 1963.

COMSAT Board elects Charyk and Harper; McConnell to step down

Prior to joining COMSAT, Dr. Charyk had been associated with the United States Air Force as Chief Scientist, Assistant Secretary for Research and Development, and Under Secretary.

Mr. Harper was elected a Series II Director of COMSAT at its Tenth Annual Meeting of Shareholders in 1973. Mr. Harper was formerly Chairman of the Board and Chief Executive Officer of Aluminum Company of America (ALCOA). He retired as ALCOA's Chairman of the

Board in 1975.

Mr. McConnell was elected Chairman of the Board of Directors of COMSAT in May 1970 and has been reelected Chairman each succeeding year since then. He was first elected to the COMSAT Board in 1969 by the Series I (public) directors. Mr. McConnell was formerly President and Chief Administrative Officer of Reynolds Metal Company until his retirement in June 1971 and remains as a director and consultant.

COMSAT General to pay cash for Massachusetts company

COMSAT and Environmental Research & Technology, Inc., (ERT) announced jointly the acquisition for cash of ERT by COMSAT General Corporation for a purchase price not to exceed \$20 million with the purchase price dependent on ERT's audited earnings for 1978.

Earlier negotiations were held on the possible acquisition by COMSAT of ERT for a combination of cash and COMSAT stock, but those negotiations were suspended in November of 1978.

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 the year ending December 31, 1978, ERT had revenues of approximately \$27 million.

The thirty-fifth meeting of the INTELSAT Board of Governors was held in December, 1978. Among its key actions the Board:

**Administrative and
Organizational Matters**

- Authorized the Director General to execute the Laboratory Services Contract with COMSAT, for the provision of laboratory services support for a three-year period commencing January 1, 1979.

- Decided to continue INTELSAT's Assignee Program and approved execution of an agreement with COMSAT for placement of Signatory assignees to perform technical work at COMSAT in conjunction with INTELSAT programs.

- Authorized the Director General to negotiate with COMSAT (Research and Engineering) on a sole-source basis a one-year transition contract for INTELSAT system planning related to the future system study, long-term allotment study, and 1979 WARC.

- Approved a sole-source contract award to COMSAT (International Operations Division), subject to negotiation of agreeable terms and conditions, for the provision of maintenance and supply services to INTELSAT.

- Authorized the Director General to convey to the U.S. Department of State INTELSAT's interest in the International Center site, located at Connecticut Avenue and Van Ness St. N.W., Washington, D.C. as the location of the permanent headquarters for INTELSAT.

- Approved an 8.5% adjustment effective January 1, 1979 to the Executive Organ salary structure.

- Decided to establish the annual salary for the position of Director General at \$75,000 tax free, effective January 1, 1979.

- Noted that the Management Services Contract terminates on December 31, 1978, and requested the Director General to convey to COMSAT the Board's deep appreciation for the excellent work performed in its role as Management Services Contractor on INTELSAT's behalf, and its

INTELSAT Board approves Laboratory Services Contract; reduces space segment charges

assistance and cooperation with the Board over the years.

Technical and Operational Matters

- Authorized the Director General to accept the proposal of Ford Aerospace and Communications Corporation to continue its efforts on the maritime communications subsystem (MCS) program through the month of January 1979 at a cost of \$1.1 million plus a cancellation charge of \$900,000 if the work is not continued. The Board also established an annual charge per MCS of \$4,675,000 and lease terms which would be included in an agreement, should INTELSAT decide to lease maritime capacity to an appropriate organization.

- Decided to modify the INTELSAT V contract with Ford Aerospace and Communications Corporation, so as to ensure that the INTELSAT V (F-5), (F-6) and (F-7) satellites are compatible with and able to be launched on the Ariane launch vehicle, and authorized the Director General to make appropriate changes to the contract to implement this decision. It authorized the Director General to purchase 14 apogee motors; to order from NASA two STS launches, backed up by an Atlas Centaur vehicle, with the first STS or Atlas Centaur to be ready for use by April 1981; to order from ESA an Ariane vehicle, with an automatic option for another, to be ready for use by July

1981; and to enter into contractual arrangements and to make progress payments necessary to implement these decisions. The Board will decide at a future date whether to use the STS or the Atlas Centaur for the launch of INTELSAT V (F-5), and how to use the Ariane and STS launch vehicles ordered above for the launching of INTELSAT V (F-6) and (F-7).

- Authorized the Director General to execute an agreement with PTT/France for provision of 14/11-GHZ CSM services at Bercenay-en-Othe from March 1, 1980 through February 28, 1985.

- Approved a revised performance specification for TV-associated sound program transmission using the FM subcarrier technique, intended to eliminate the possibility of interference with the program baseband.

- Expressed the finding pursuant to Article XIV (c) of the Agreement that the Iranian Zohreh 1, 2 and 3 networks are technically compatible with the existing and planned INTELSAT space segment; noted that the Advisory Committee on Technical Matters concurred that the Colombian SATCOL domestic system is technically compatible with the INTELSAT system; noted that the ECS sponsors will continue in close contact with the Director General in developing additional information in accordance with the procedure for economic coordination.

• With regard to arrangements for INTELSAT provision of television service between the U.S. and Mexico and pursuant to Article III (e) and (f) of the INTELSAT Agreement, authorized the Director General to conclude lease agreements with the U.S. and Mexican Signatories reflecting full recovery of all costs incurred by INTELSAT and a pass-through of terms and conditions negotiated with the space segment supplier, and a simultaneous agreement with an appropriate U.S. space segment supplier to lease capacity in a Westar satellite for an eighteen month period. The Board also approved in principle the preemptible lease of one-quarter transponder to Denmark, one-quarter transponder to Egypt and approved an agreement with Brazil for the preemptible lease of two global beam transponders and one-half of a hemispheric transponder. The Board decided to tender advice to the Meeting of Signatories that the Peruvian domestic services on its leased quarter transponder meet the requirements in Article III (b) (ii) of the Agreement for consideration on the same basis as international traffic.

• Extended for one year, commencing January 1, 1979, approval for the Clarksburg UET to access the

space segment free of charge, and extended for three months free access for the Automatic Seismic Installation Terminal at McMinnville, Tennessee to conduct experiments and demonstrations. The Board also approved access subject to specified operating conditions in each case: four stations for use in connection with Oman's leased transponder; a Korean station for providing a standby capability to restore service in the event of a failure of the Korean Standard A station; two Yemen Arab Republic stations for free access to carry out tests and demonstrations; and a transportable Saudi Arabian station. The last station was approved subject to review by the Advisory Committee on Technical Matters, and is restricted to operation within Saudi Arabia and with leased transponder capacity.

Financial and Legal Matters

• Approved the 1979 INTELSAT Budget including capital expenditures of \$207,995,000, revenues of \$187,546,000 and total expenses of \$105,668,000. The Board also approved the addition of thirty-seven positions.

• Approved the 1979 INTELSAT R&D program, including contracted-out exploratory research and study ef-

orts amounting to \$1.572 million and \$3.0 million for contract commitments on new development projects.

• Decided to reduce the rate per unit of utilization from \$570 to \$480 per month (\$5,760 per year), and to reduce the SPADE charge from 8 cents to 7 cents per minute, effective January 1, 1979. It decided to maintain charges for occasional use for television and cable circuit restoration at existing levels. The Board also extended the present occasional-use service for program channels to include 4-kHz channels, reduced the rates for single destination transmission to \$7.50 for each 4-kHz bandwidth between 4 and 16 kHz, and increased the per-occasion charge to \$25 at each end. For multi-destination transmissions the transmit station will pay all, and each receive station half, of these rates. The charges are applicable only where space segment capacity is provided within an assigned FDM/FM carrier.

(Continued on page 16)

The preceding report was prepared by Jay Trager, INTELSAT Affairs, International Operations Division.

COMSAT Directors' R&D Committee visits Labs



Members of the R&D Committee of the COMSAT Board of Directors visited the Labs during the recent Directors' meeting to review the proposed 1979 Corporate R&D Program. Shown touring the Communications Processing Lab escorted by Labs Personnel are, left to right: Joseph Deal (Labs), Joseph V. Charyk, Lou Early (Labs), Gordon Edwards, John V. Harrington, William W. Hagerty, Bruce G. Sundlun, John D. Harper, Lewis S. Norman, Jr. (Labs), B. I. Edelson (Labs), John A. Johnson, Louis Pollack (Labs) and J. W. Breslow (COMSAT)

PHOTO BY BILL MEGNA

IOD's Colino resigns; Goldstein named acting head



Richard R. Colino

Richard R. Colino, Vice President and General Manager, International Operations Division, resigned from COMSAT effective February 11, 1979, to assume the post of President and Chief Executive Officer of Continental Home Theatre, Inc.

In a memo announcing the resignation of Mr. Colino COMSAT President Joseph V. Charyk said, "Over the span of 14 years, Mr. Colino has made noteworthy contributions to COMSAT and to the development of international communications via satellite. He will be personally missed as will his substantive contributions to our Corporation. We all wish him the best of success in his new undertaking."

Joining COMSAT in 1965 as Assistant for Interim Communications, Satellite Committee Affairs, he has served as Director-International Arrangements Division; Director-European Office; Alternate U.S. Representative to the Board of Governors, INTELSAT; Alternate U.S. Representative to the Conference on Definitive Arrangements; Assistant Vice President-International Affairs; Assistant Vice President, International Relations and Corporate Planning; Assistant Vice President and U.S. Gov-



Irving Goldstein

ernor, INTELSAT; and Vice President, U.S. INTELSAT Division.

Mr. Irving Goldstein, Assistant General Manager, INTELSAT Operations Division, has assumed responsibility on an acting basis for the operation of the division.

INTELSAT takes over own management and operations

INTELSAT, the more than 100 member-country organization that owns and operates the telecommunications satellites used by countries around the world, has assumed responsibility for all of its own management and operational activities.

Since its establishment in 1964, the administrative and operational functions of INTELSAT were carried out by COMSAT under interim agreements. With the approval of definitive arrangements in 1973, INTELSAT began a process of gradually assuming more of its own responsibilities.

Until the recent termination of a Management Services Contract, COMSAT continued to carry out many tasks on behalf of INTELSAT including

procurement of satellites and launch services, operation and maintenance of INTELSAT's satellite system facilities, technical studies and research and development projects.

COMSAT will continue to perform some technical services for INTELSAT under two Technical Services Contracts and a Laboratory Services Contract.

50¢ quarterly dividend declared by COMSAT Board

The COMSAT Board of Directors declared a regular quarterly dividend of 50¢ per share at its January monthly meeting. Its thirty-fourth consecutive quarterly dividend, and the fifth at the 50¢ rate, the dividend is payable on March 12, 1979, to all shareholders of record as of the close of business on February 9, 1979.

Maritime-equipped Vs planned for network

INTELSAT will build facilities for maritime communications services into several of its next-generation, INTELSAT V satellites.

The INTELSAT Board of Governors, at its January meeting, decided to go ahead with plans to install equipment designed to provide maritime communications services on board the fifth, sixth and seventh in its series of INTELSAT V satellites now on order. The satellites carrying the maritime packages are to be placed in orbit commencing during 1981-82.

It is planned that the maritime-equipped INTELSAT Vs will become part of a global system operated by

(Continued on page 16)

COMSAT has called for the early establishment of the proposed International Maritime Satellite Organization—INMARSAT—and announced that it has signed the INMARSAT Operating Agreement.

INMARSAT would provide commercial global maritime communications services after the expiration of services through the present MARISAT system.

COMSAT President Joseph V. Charyk announced COMSAT's intention to accept an initial INMARSAT investment share of 35 percent, more than twice the minimum set forth in the agreement. At least 95 percent of the shares must be accepted before INMARSAT can come into existence.

If 95 percent of the shares have not been accepted by May 15, 1979, Dr. Charyk said COMSAT would be
(Continued on page 16)

COMSAT calls for early establishment of INMARSAT

John A. Johnson, Chairman and Chief Executive Officer of COMSAT General Corporation and a Director of COMSAT, signs the INMARSAT Operating Agreement on behalf of COMSAT as C. P. Srivastava, Director General of the International Maritime Consultative Organization looks on. The Operating Agreement, and the Convention that is to be signed by governments, contains the terms and conditions for participation in the proposed International Maritime Satellite Organization (INMARSAT).



NASA's Shuttle/ESA's Ariane scheduled for use with INTELSAT Vs

INTELSAT's Board of Governors has decided to use both the United States' Space Shuttle and the European Ariane Launch Vehicle to place its later INTELSAT V series satellites in orbit.

At its recent meeting in Washington, the Board stated INTELSAT's intention to order two Shuttle launches from NASA and one Ariane from the European Space Agency (ESA).

The orders, worth a minimum of

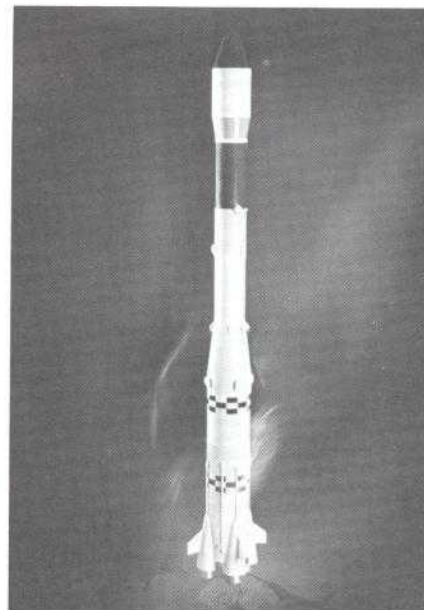
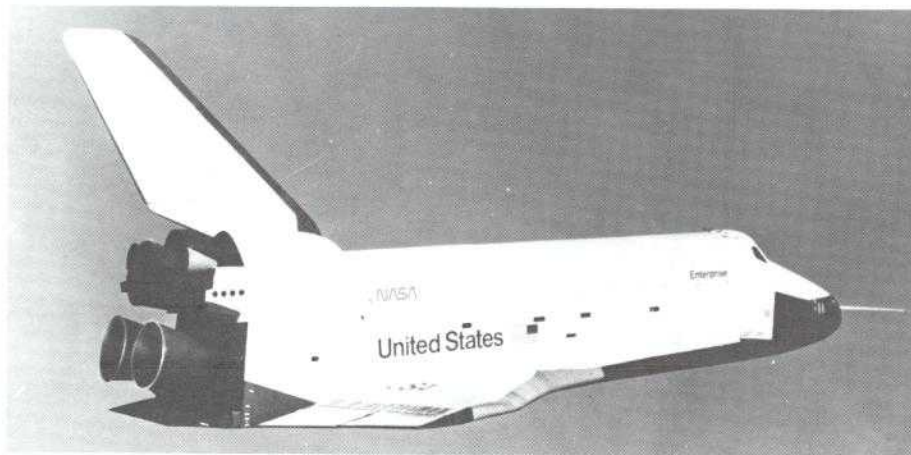
\$82 million, will cover the orbiting of the fifth, sixth and seventh satellites in the INTELSAT V series during the 1981-1982 time frame.

The decision by the Board of Governors breaks new ground for INTELSAT in that the Shuttle will provide INTELSAT with its first experience with reusable launch vehicles and the use of the Ariane will be INTELSAT's first use of a non-U.S. launch vehicle.

According to INTELSAT, the launch decision was made difficult in that neither the Shuttle nor the Ariane have been proved in operation.

The earlier INTELSAT V series satellites, as were the current INTELSAT IV and IV-A satellites, are scheduled to be launched using NASA Atlas Centaurs. INTELSAT's agreement with NASA includes a provision for an Atlas Centaur back-up should the first Shuttle not be available.

Shown below is NASA's Space Shuttle to be used in placing later INTELSAT Vs in orbit. The use of the European Space Agency's Ariane (photo at right) for the launch of one of INTELSAT Vs will be INTELSAT's first use of a non-U.S. launch vehicle.



Junior Achievers benefit from COMSAT expertise

BY MIKE SMITH

Three years ago COMSAT made a very unusual investment. There would be no monetary return on this investment; in fact, the original cash contribution wouldn't be recovered. What money manager would make such a decision? Actually, this payment was not meant to be a money making investment, but a contribution to Junior Achievement (J.A.).

Every year since 1976 COMSAT has made additional contributions to J.A., an investment in the lives of high school students and the community. The contributions from COMSAT, as well as those from numerous other corporations worldwide, are used by J.A. to fund and develop its educational program. This program introduces high school students to the free enterprise system as they organize and manage their own small-scale companies under the guidance of adult advisers. These companies elect officers, produce goods, sell stock, pay salaries, and, if profits are sufficient, declare and pay dividends. The students make all

final decisions, while the advisers perform the duty their title implies.

Besides providing a monetary contribution, COMSAT also provides advisers for the J.A. companies. As in previous years, the 1978-79 adviser team is led by Mel Williams, the Executive Adviser. Johan Curtin and Mike Smith are marketing advisers, Mike Glasby and Aaron Goldsmith help with production, and accounting is counselled by Collenia Linzy and Doug Trueheart.

(Continued on page 16)



COMSAT General's Collenia Linzy (right) provides assistance to a student in the production of macrame plant holders.

COMSAT's Aaron Goldsmith (standing) and Doug Trueheart (extreme right) review sales techniques with Junior Achievers during regular meeting.



In the photo below are COMSAT's Junior Achievement Advisors, left to right (front row), Collenia Linzy, Johan Curtin and Douglas Trueheart; (back row) Aaron Goldsmith, Michael Smith and Mel Williams. Advisor Mike Glasby is not shown.

PHOTOS BY MIKE GLASBY

COMSAT's Mike Smith (center) offers management expertise to Bernadette Thompson (left) and Regina Walker as they prepare for a weekly meeting.





NOTES FROM PERSONNEL

Medical insurance to pay maternity benefits

Effective in late April 1979, COMSAT's medical insurance will pay maternity benefits in the same manner as any other disability covered by Lincoln National.

Instead of a flat \$500 coverage, basic benefits will pay 100 percent of the first \$1,500 of covered hospital charges; after that, major medical will pay 80 percent of covered hospital-surgical expenses. (Of course, the deductible for the year must be met.)

Our medical insurance coverage is explained in detail in the "Medical Insurance" section of the Employee Handbook, disregarding page MEDICAL/16, "Maternity Benefits."

Leave taken due to pregnancy is handled the same as any disability. For the first year of employment, an employee has 10 days of sick leave at full pay. The employee will thus receive 100 percent of her salary through the tenth day of the leave; beyond that she must take leave without pay. From the second through the fourth year of employment, an employee has 20 days of full pay, and 110 days at 70 percent for a total of 130 days. After the fifth anniversary, she has 65 days at full pay and 65 days at 70 percent of pay.

Normally, short-term disability leave starts when the doctor determines that the woman must stop working and continues for up to six weeks after delivery, or until the doctor approves her return. The Deputy Director of Personnel must approve a request for leave beyond six weeks. When short-term disability leave is used up, an employee can request a six-month leave of absence for which she will receive no pay.

Remember that if you are a member of the HMO, maternity-related expenses are paid in accordance with the provisions of your HMO contract. Short-term disability leave, of course, is company policy and applies to all employees no matter which insurance plan is used.

Short-term disability leave is explained in the Handbook on page DISABILITY/5.

Ten-day posting period for non-management slots

The policy of posting non-management positions within COMSAT was established to provide promotional opportunities for our employees and to allow management to fill openings with qualified employees who have demonstrated good performance.

The policy provides a 10-day period in which position openings are posted on our bulletin boards for employee consideration. It has been the practice to keep these positions listed on the bulletin boards until filled. This practice has been changed, as announced by the Staffing Department, to emphasize the importance of employees applying within the 10-day posting period.

At the end of the 10 days the list of open positions will be removed from the bulletin boards, and external recruiting will commence. Employees interested in applying for positions no longer posted may review the master list of open positions that is maintained by the Staffing Department.

BY HOLLY PRYATEL

Increase in SS deductions reflected in smaller paychecks

By now you have probably become accustomed to seeing a smaller amount of money in your 1979 paychecks. Unless you've changed your benefits deductions, this decrease is due to higher social security (FICA) deductions. The social security tax rate for 1979 is 6.13 percent compared to 6.05 percent for 1978. The maximum amount of earnings on which social security taxes are paid (the wage base) has also risen—from \$17,700 to \$22,900.

There will be additional increases in the tax rate and the wage base in future years. The table below shows the tax rate for 1980 through 1990, and the wage base for 1980 and 1981. Starting with 1982, the earnings base will rise automatically according to increases in average wage levels.

In	Employers and employees each will pay	On earnings up to
1980	6.13%	\$25,900
1981	6.65%	\$29,700
1982	6.70%	*
1983	6.70%	*
1984	6.70%	*
1985	7.05%	*
1986	7.15%	*
1987	7.15%	*
1988	7.15%	*
1989	7.15%	*
1990	7.65%	*

Ms. Pryatel is an Employee Relations Specialist in the Personnel Office.

INMARSAT

(Continued from page 13)

prepared to commit to whatever deficiency exists between the total investment shares accepted and the 95 percent required, to insure that INMARSAT will come into existence 60 days thereafter.

COMSAT believes that the early establishment of INMARSAT would be the most efficient and effective means for proceeding with planning for a second generation maritime satellite system to assure continuity of services.

"When INMARSAT comes into being," Dr. Charyk said, "INMARSAT itself could then make the final decisions on the satellites to be used and make the necessary contractual arrangements."

COMSAT has been discussing with other prospective INMARSAT participants the nature of the commercial maritime system to succeed the MARISAT system, developed and managed by COMSAT General Corporation, COMSAT's wholly owned subsidiary. The MARISAT system, which will operate into the early 1980s, provides high-quality communications satellite services to the U.S. Navy and to commercial shipping and off-shore industries through three multifrequency satellites.

In order to bring INMARSAT into existence, two INMARSAT agreements,

an agreement among governments (the Convention) and an agreement among operating entities (the Operating Agreement), must be signed by July 5, 1979, by countries accounting for at least 95 percent of the total initial investment shares of INMARSAT.

The Operating Agreement was signed on behalf of COMSAT on January 10 by John A. Johnson, a COMSAT director and Chairman and Chief Executive Officer of COMSAT GENERAL, at the London headquarters of the International Maritime Consultative Organization.

It is expected that the U.S. Government will sign the Convention within the near future.

INMARSAT would be patterned along the lines of INTELSAT, the International Telecommunications Satellite Organization, through which COMSAT provides international communications satellite services.

In 1978 the U.S. Congress passed and the President signed into law the International Maritime Satellite Telecommunications Act which designates COMSAT as the sole operating entity of the United States for participation in INMARSAT.

INTELSAT

(Continued from page 11)

• Approved charges for one-way data services: for a 64-kb/s trans-

mission rate the Standard A or B transmitting station pays a charge of one-half unit, the Standard A receiving station pays a charge of one-half unit, and the Standard B receive station pays a charge of one full unit; for transmission rates which are multiples of 64 kb/s (up to 2048 kb/s), the above charges will be multiplied by the transmission rate divided by 64.

• Approved loan to the UK Signatory of an echo canceller, developed under the INTELSAT R&D program, for experimental use at no cost or liability to INTELSAT.

MARITIME PACKAGES

(Continued from page 12)

the about-to-be-formed INMARSAT. In this system, the INTELSAT vs, as well as performing their normal international communications roles, would work to provide ship-shore-ship communications and other services.

The maritime packages for the three INTELSAT vs, worth a total of \$26 million, are being developed and built by Ford Aerospace and Communications Corporation, prime contractor for the INTELSAT v satellites.

BOOKS WORTH READING

(Continued from page 17)

new business opportunities in using the new satellites which are accessed by small rooftop and parking lot earth stations. Systems analysts should understand the implications of satellites because they change what is needed in data communications protocols, terminal selection, design of end-user dialogues, and distributed processing. The redesign of corporate networks to take advantage of satellites affects DP strategy.

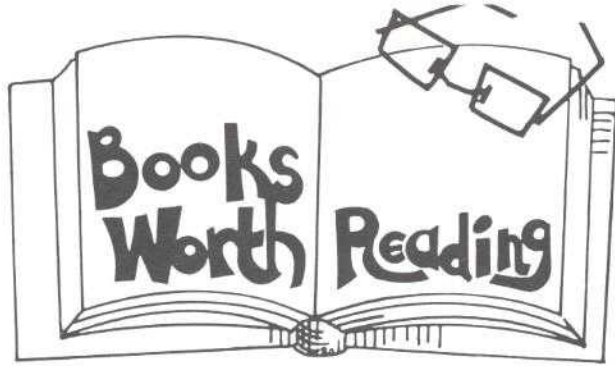
"Satellite communications is plung-

ing downwards in cost. However, it competes with much that is traditional. Old, established telecommunications organizations see the new technology as a threat. It is being resisted by telephone administrations in many countries. In some countries, new legislative barriers have been erected against satellite communications technology. It is desirable that there should be widespread comprehension of what large satellites launched with the space shuttle could do, so that corporations, the public, and the economy are not robbed of the immense benefits."

JUNIOR ACHIEVEMENT

(Continued from page 14)

This year's J.A. companies are operated by students from Eastern High School in the District of Columbia. Weekly meetings are held at the Mt. Jezreal Baptist Church, also in D.C. The two companies have been chartered and have produced and sold trouble lights, aluminum can lamps, and macrame plant hangers. The Boards of Directors feel confident of turning a profit, but regardless of the outcome, the experience gained will be invaluable.



Editor's note. The following "Introductions" are reprinted from Mr. Martin's books now available in the Central Library.

The Wired Society, James Martin, Prentice-Hall, Inc., 1978.

Imagine yourself absorbed into the world of the future. You lean

three days of work. But there's no need to fight the morning traffic—there's no need to even go to the office—just check you computer terminal to see what instructions your boss has left you. If you have any questions you can reach him by videophone.

Sound implausible? Not to James

has already arrived, with most of these "tele" inventions now in the early stages of use.

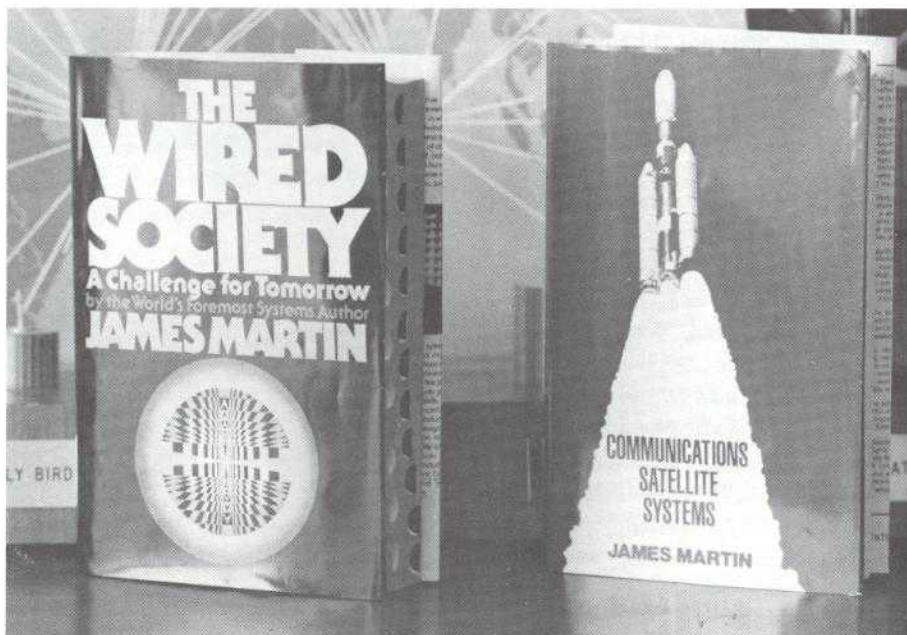
Fascinating, timely, and provocative, *The Wired Society* is an absorbing preview of the not-too-distant future—a future in which we can either be slaves to our dwindling resources or in which we can harness technology to create a beautiful world of abundance, without the destruction of nature, without pollution—a world in which humankind is free as never before to achieve new forms of greatness. The choice is ours: James Martin shows the way.

Communications Satellite Systems, James Martin, Prentice-Hall, Inc., 1978.

The author writes in his Preface, "The potential of satellite communications is so great that it can change the entire fabric of society. At some future time, advanced countries will have vast numbers of small antennas receiving mail, television, and computer communications via satellites. As petroleum costs rise, large-screen teleconferencing, interactive education, and new electronic networks will change working and living patterns. The office of the future will not need to be in a big metropolis. Computer system architectures and uses will be different because of the high bandwidth transmission links.

"We are rushing headlong towards a world of immensely powerful micro-processors, giant data banks, and very high capacity channels spanning the world. Communications satellite technology is often misunderstood. In some ways it is fundamentally different from terrestrial telecommunications. This book attempts to explain the subject, the tradeoffs, and the implications for system design. Corporations in countries which permit it should now be planning how the new satellite facilities will change their telephone and data networks, their word processing and mail, their travel budgets, training, and human communications. There will be many

(Continued on preceding page)



forward, turn on your 7-foot television screen. You could watch a movie, sports, or news, but instead you decide to see what life is like in another corner of the world. So you turn to the travel agent's channel, select a country, sit back, and watch an array of action views from some exotic land.

Perhaps you'd like to play chess. Simply punch into the computer in your living room and you have an instant partner.

Want to shop? Turn to the shopper's catalog on the TV dial where you can purchase anything from clothing to computers.

Tomorrow is a work day. After four days of leisure, it's time for

Martin, the world's foremost systems writer. Sharing a bold new vision of the world to come, Martin takes you on an exciting journey through a society whose very texture and fabric have been shaped by a revolution in telecommunications, a world where words such as "telebanking," "telemedicine," and "telehighways" will be as common as telephone and television are today.

Using everyday nontechnical language, Martin vividly demonstrates how developments in telecommunications will affect the way we shop, bank, work, spend our leisure, form communities, educate our children, and govern ourselves. He also shows that, in many instances, teliving

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

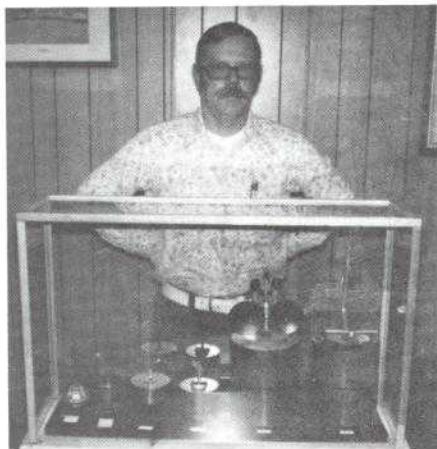
Pat Hogan

Southbury

Eileen Jacobsen

ANDOVER. The Annual CEEA Christmas Party was held at the Country Way Restaurant in South Paris with music provided by the Travellers. The Children's Christmas Party complete with Santa Claus (with gifts), cookies and punch was held in the Visitors' Building.

Bruce Simmons with his recently completed satellite display.



The election of the new Board of Directors for the CEEA is underway. Our appreciation goes to the outgoing Directors for their efforts in manning the vending machines and planning the year's picnics and parties. **Don Verrill** has been at home recovering from an appendectomy.

Construction on the new TTC&M antenna is progressing well in spite of sub-zero weather. The MUX installation is complete and the NEC personnel, along with Headquarters' **Paul Hanna**, departed the site early in January.

In the accompanying photo **Bruce Simmons** is shown with the display he has been working on for some time. The display includes scale models of satellites to include Telstar, Early Bird, INTELSAT II, INTELSAT III, INTELSAT IV and INTELSAT IV-A.

—Joanne Witas

BREWSTER. Four employees received Ten-Year Service Awards in 1978: **Donald Allen**, **Wayne Colpitts**, **Melvin Hofmann** and **Dorothy Buckingham**. Two new employees were added to the staff during the year: **William Glandon**, Utilityman, and **Robert Erskine**, Facilities Mechanic.

A really "new" member of our COMSAT family is **Sarah Sanderson**, the new baby daughter of **Bob** and **Sheryl Sanderson**.

Our annual CEA Christmas Party was held at the Cariboo Inn in Okanogan with most off-duty personnel and their spouses attending. We were pleased to have **Imogene** and **Bill Cook** and **Dewey** and **Rita Martin** join us for the evening. Imogene and Dewey are former members of the Brewster staff.

The year ended disappointingly for our skiers—lots of cold weather with very little snow.

—Dorothy Buckingham

CAYEY. Our staff enjoyed the traditional Thanksgiving Day turkey at a station celebration sponsored by the CEEA.



Thanksgiving Day turkey luncheon sponsored by the CEEA.



Multimedia first aid class held for station personnel.

A multimedia first aid class was held for all station personnel and was conducted by our certified instructors **Otto Irizarry** and **John Gonzalez**. We soon hope to have certified CPR instructors to meet all possible future needs. We also have a good safety program going and are conducting a campaign to discourage smoking.

—E. V. Castro

ETAM. Two new employees have joined our staff: **Gary Cochran**, Junior Technician, and **John Haller**, Electronics Engineer. Gary resides in Grafton with his wife and five boys. John is a bachelor and lives in Kingwood.

The Etam CEA sponsored two dinners over the past few months at Alpine Lake at Terra Alta, West Virginia. CEA elections for 1979 were held recently. The Chairman and Representatives for the new year are: **David Cross**, Chairman; and Representatives **Paul Helfgott**, Administration; **Ronald Feather**, Facilities and Electronic Maintenance; **Donald Riffle**, Blue and Gold Teams; **Gary**

Cochran, Red and Grey Teams; and R. DeNigris, ITT and AT&T.

We can report a much milder winter this year in comparison to the two previous ones, much to the delight of our station personnel. —**Bev Conner**

JAMESBURG. Hewlett Packard has accepted two programs from Jamesburg employees. **George Furford**, Team D Supervisor, submitted a program identified as 02904D 67-Data Sorting/Handling, and **Dale Farmer**, Electronic Technician (now with SBS), formerly with Team B, submitted a program designated 02196 97-Planetary Positions.

John P. Scroggs, Station Manager, recently presented One-Year Awards to Junior Technician **Allan L. Mayland** and **Peter S. Rasher**, who received his promotion to Technician along with his service award.



Station Manager John Scroggs presents service awards to Peter S. Rasher (photo above) and Allan L. Mayland, Jr., (bottom photo).



Our annual CEA Christmas Party was held at the Outrigger Restaurant located on scenic Monterey Bay with an enjoyable time had by all.

—**C. B. Marshall**

LABS. The Lyn Russells, E. Ford, Pep Ruddiman, B. Jacocks and Rosa Liu hosted an "Open House" for the Administrative Services Group at the Russells' home recently. "Happy Housewarming" to Julia Wallick, Charlotte Scott, Linda Doulos, John Reisenweber and Betty Mowen.

A very jolly Santa Claus visited the Labs this Christmas passing out gifts. To those mystified as to Santa's true identity we must credit Shirley Anders for her super Santa. Spacecraft Labs had its Christmas Party at the Golden Bull Restaurant.

A farewell party was given in early January in honor of **Kevin Hodson**, an INTELSAT Nominee, who has been working in the Digital Modulation and Techniques Department for the past two years. Kevin has returned to the U.K. **Debbie Moore**, a temporary on Christmas vacation from Eastern Kentucky University, filled in in Word Processing for **Shirley Taylor** during Shirley's three-week vacation in California. **Don Zyriek**, the Semi Conductor Technology Department Co-Op, is back at the Labs from Georgia Tech for this term.

Other comings and goings include the **Allan Cramers** spending Christmas in Puerto Rico; **Chis Imman** to snowy Boston; **Donna Owens** vacationing in Los Angeles for two weeks plus; and spending New Year's Eve in Times Square were **Marianne Merrihew**, **Andy Brunk**, **Yvette Viviani** and **John Effland**. **Shirley Taylor** spent the holiday season with her sister in Oakland, California, and sampled the extremes of California scenery, traveling from Donna Lake in the ski country of the High Sierras near Lake Tahoe one weekend to Carmel-by-the-Sea the next. No sooner did Shirley return than she plunged into rehearsal for "40 Carats," a play being produced by Potomac Playmakers in Hagerstown.

Presented with Ten-Year Service Awards were **B.I. Edelson**, **Milton Carter**, **Dayamoy Chakraborty**,

Donald Fietkiewicz, **Robert Gruner**, **Otakar Horna**, **Jiausen Jih**, **Joachim Kaiser**, **John Maddox**, **Marianne Merrihew**, **Kenneth Peas**, **Al Walker**, **Samuel Wax**, **Donald Wentworth** and **Pier Bargellini**.

Receiving Five-Year Awards were **John Castorina**, **Jerry Creamer**, **Linda Duolos**, **John Elsback**, **Ronald Johnson**, **David Kurjan**, **Diane Lusby**, **James Proctor**, **Lorin Rodgers**, **John Snyder**, **John Stewart**, **Vasil Uzunoglu**, **K. Virupaksha** and **Pamela Wood**.

Labs awards presented recently were: Patent Incentive—**William Childs**, **Russell Fang**, **Randall Kreutel**, **Lin-Nan Lee**, **Andrew Meulenbergh**, **Chester Pentlicki**, **Smith Rhodes** and **Edmund Rittner**; "One Gallon" blood donors—**Roger Colby**, **Fred Esch**, **Blanca Martin**, **Daniel McAuliffe**, **Henry Parker**, **David Perlmutter** and **Dirk Vanderloo**; Safety—**Michael Onufry**.

Virginia Hott has a new daughter, **Brandy Nicole**, weight six pounds, four ounces. The **Bartolome Arroyos** also have a new daughter, **Wanda**, weighing in at nine pounds, three ounces. **Jiausen Jih** has been reporting sub-zero temperatures from his new house on Braddock Heights this winter with some reports differing by as much as 15 degrees from those of the local news station.

In sports, paced by our own **Andy Brunk**, the Montgomery County Board of Education League closed the season with a fine exhibition of bowling. Andy blasted out games of 192, 227 and 232 (651 total). It was his first 600 set which also set a new record high for the league this year. **Ralph Burall**, subbing for the Calibration Team, accumulated a set score of 608 with 161, 223 and 224 games. Our Gaithersburg Super B League basketball team won the first three games of a 10-game schedule by a total of seven points. Team members are **Robert Holston**, **A. Kevin Grantham**, **Andy Brunk**, **Britt Orrison**, **Marvin Stanton**, **Skip Stanton**, **Kave Vanderhart**, **Pete Carlton** (coach) and **George Meadows** (coach).

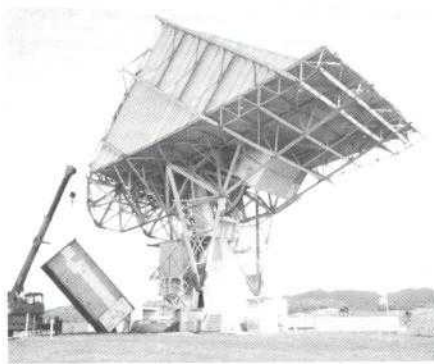
Terminating employment with COMSAT were **Gert Van Ommering**, **Kevin Hodson**, **Herbert Moreno**, **Alan Stansbury**, **Ken Betaharon**, **Manouchehr Mohaseri** and **Hiketoshi Nishi** (INTELSAT Nominee returning to Japan).

New Labs employees include **Charles Arvin**, **Ralph Ambrose**, **Robert Egri**, **Robert Sorbello**, **Belinda Haddock**, **Steve Gray**, **Robert Parker**, **Kitty Heh**, **Sharon Properzio**, **Sharon Draper**, **Ruth Ann German**, **William Timoney**, **David Handy**, **George Corbin**, **James Miller**, **Michael Hofe**, **William Meitzler**, **Robert Cassagnol**, **William Hersey**, **Michael Hurst**, **Robert Kibler**, **Kevin Lambert** and **Linda Nixon**. —B.P.S.

M&S CENTER. The M&S Center Annual Christmas Party was held at the home of **Ellen** and **George Robertson** with approximately 30 Center staffers and family members attending. The Calibration Team of **Chuck Andersen** and **Frank Sandel** visited the Cayey and Managua stations prior to the end of 1978. Team members **Don Rounsaville** and **Chuck Andersen** visited Etam early in 1979.

Erma and **Bud Kennedy** have been getting around recently—they spent their Thanksgiving holiday in Hawaii and were provided tours of the Island by **Bob Makizura** and his family, then spent the Christmas holidays in Florida visiting Bud's parents. **Mr. Abdelkader Bairi** and **Mr. Mohamed Falah Youyou** of Algeria recently visited the Labs and were given a tour of the Center. —**Darleen Jones**

PAUMALU. While activities leveled off at the year's end due to the Holiday period, 1979 was ushered in with some interesting activity. During the early part of January, the high-power testing of the Rantec Feed from the new TTC&M antenna was conducted.



Feed in sea container is hoisted into position for high power testing.

The feed, some 20 feet long and weighing almost three-quarters of a ton, was brought in by ship to Honolulu and trucked to the site. During the testing, as well as during shipment from the Rantec facility in California, the feed was housed in an 8' x 8' x 20' sea container. The container-housed feed was held up at the correct pointing angle by a crane as shown in the accompanying photo. The feed was connected to the TT&C antenna transmitter to test it under high power conditions. Paumalu was chosen for the test because of its geographic location and the availability of a high power transmitter.

The feed testing was performed by a team of engineers from Rantec Corporation, manufacturer of the feed, and TIW, prime contractor for the antenna construction. **Ronald Price** of COMSAT Labs monitored the testing and **Ken Yamashita**, Station Engineer, assisted in setting up station equipment required for the testing. Construction of the latest antenna addition at Paumalu is scheduled to begin soon.

One of the most elegant dining spots on the Island, the Kahala Hilton, was the setting for the CEA-sponsored Holiday parties for station employees and their guests. The parties were held on two evenings to accommodate shift workers. The ex-

cellent cuisine and beautiful setting added to the festive spirit of the groups and was enjoyed by all. Handling party arrangements for the CEA were **Tim Kolb**, **Tom Kaneshiro**, **Cenon Usita**, **Don Stribling** and **Jack Vollrath**. —**Bob Kumasaka**

PLAZA. It's a boy, **Martin Stanislaus**, for **Victor** and **Margaret Slabinski**, born in late December, weighing in at eight pounds, three ounces. Welcome back to Personnel's **Pat Cramer** after recuperating from surgery. Personnel's **Irma Burris** is at home recovering from a broken ankle.

Service Awards were presented to **William B. Lockett**, ten years; and to **Tish Fonda**, **Cristina Ullis**, **Willie E. Walters**, **Richard E. Keefer**, **Susan A. Turnbull**, **Robert N. Axelrod**, **Wayne D. Cade**, **M. Beth Corry** and **Arthur W. Romerhaus**, 111, for five years service.

Received a letter recently from **Paul Eckley**, former Manager of Reproduction and Distribution, General Services, now retired, from Bradenton, Florida. Says he expects to move into his new home in Clearwater around April or May.

—**Mary Lane**

SOUTHBURY. **David C. Parsons**, formerly of New Hampshire, has joined our staff as a Technician. **Denis Bouchard** attended an orientation at Washington Headquarters and was conducted on a tour of the Labs.

MARISAT Operator **May Scott** is now a grandmother (first-time); her daughter Lorraine gave birth to a baby boy. **MARISAT** Operator **Rose Marie Eureka** announced the engagement of her daughter Deborah Carroll to Jeff Lawlor while **MARISAT** Operator **Joanne Coughter** plans to be married in the Fall.

—**Eileen Jacobsen**

ENERGY SAVING BRIEFS

Today's homeowners are frittering away billions of dollars a year by letting much of the heat they pay for literally go out the window.

The fact is that windows account for the typical home's biggest winter heat loss, next to poorly insulated ceilings, roofs, or attics.

Now, however, scientific data show that a simple, inexpensive means is available to cut down on this loss and on the costly energy needed to replace it.

Energy saving at home

By simply lowering or raising your window shades during the day when it is coldest outside, you can thwart the escape of your furnace-generated heat by as much as 31 percent, according to a laboratory study conducted by a team of researchers at the Illinois Institute of Technology in Chicago.

This can help keep your heating bills under control. That's because the colder the inside of your house gets, the greater your demand for energy to keep it warm.

Glass windows are an excellent conductor of heat. As such, they are a poor insulator. That is why indoor heat will pass through glass, and why heat intended for the inside of your home is lost to the great outdoors.

Now that the cold weather is upon us, here are some sound tips that come out of that window shade research: keep your shades drawn in the evening, at night, and throughout the early morning when the air outside is most cold. You'll find that your shades act as barriers to block the loss of heat through the windows. Much of the heat that normally seeps through your windows "bounces" off the shades and is kept where you want it, inside the house.

During the sunny, daylight hours, pull your shades up. You'll be letting in some of the sunlight which will help to warm the interior and cut your use of heating fuel.

The Illinois Tech researchers estimate that these simple shade-pulling exercises can result in savings of up to eight cents per heating dollar for homeowners living in moderate climates. This is good news for people who have watched their heating bills skyrocket in just a few short years. This fuel-saver could soon be even more valuable: authorities are forecasting that the cost of energy, which is twice what it was as recently as 1973, could double again in the next five years.

Simulating Midwest winter conditions with typical 20° to 50° F. temperatures, the researchers compared the heat-blocking efficiency of window shades to that of venetian blinds and draperies. The results showed that shades prevent up to 31 percent of heat usually lost through windows. Blinds and draperies kept in six to seven percent of window heat loss, only about one-fourth of the effectiveness of window shades. Both the window shades and venetian blinds tested had one-quarter-inch clearance along each vertical edge and touched the sill. The drapes completely covered the window.

Energy saving at the office

Efficient energy use around the office can make a difference on commercial fuel bills. With energy costs rising at record rates, energy conservation at work has become a must. The alternative is an energy budget that increasingly eats into profits and payrolls.

The largest item in an office building energy budget is the expense of heating and cooling. Efficient operation of heating and cooling equipment is largely the responsibility of building managers, but office workers can help by cooperating on a program of sound office energy management.

For instance, about 22 percent of all electrical energy generated in

the U.S. is used for lighting, half of this for lighting in office buildings. Office employees who are in the habit of leaving lights on in unoccupied work areas are out of step with the reality of high energy costs. Turn off lights and electrical equipment when not in use.

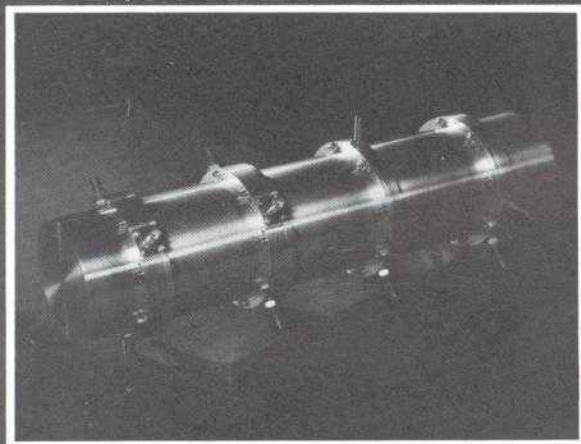
The Washington-based Alliance to Save Energy has some suggestions for efficient energy use around the office:

- Work with the building manager to develop a comprehensive program for reducing the energy costs of heating, cooling, and lighting the entire building.
- Make maximum use of daylight and desk or task lighting in order to reduce the need for expensive overhead lighting. Post notices near light switches to remind fellow employees to douse unnecessary lights.
- Take a look at how efficiently office equipment is used. Are typewriters left running all day? Is that extra copying machine necessary? Typewriters, copying machines, automatic pencil sharpeners, tape recorders, radios, coffee makers, computers, and postage machines—the use of all electrical office equipment should be reexamined in the light of rising energy costs.
- Use office supplies sparingly. Don't waste paper. It takes energy to produce paper, write on it, dispose of waste paper, and replace it. Use both sides of a sheet of paper when possible. Eliminate unneeded copies.
- Alert all fellow employees to the importance of using office energy efficiently.

An Energy Saving Brief from the ALLIANCE to SAVE ENERGY.

Better filters for space . . .

From COMSAT Labs



Significant advancements in microwave filter technology have been achieved with the lightweight dual mode microwave bandpass filter developed by COMSAT Laboratories.

The new 4 GHz filter introduced by COMSAT Laboratories weighs only 206 grams. Use of this type of filter on the INTELSAT V satellites represents a dramatic reduction in weight from the INTELSAT IV filter weight of 2.3 kilograms.

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Pathways

SATELLITE

March-April 1979
Volume 4 Number 2

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*Paumalu Earth Station
Island of Oahu, Hawaii*

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Cover. An aerial view of COMSAT's Paumalu Earth Station on the North Shore of the Island of Oahu, Hawaii. The photo was one of a series taken for a feature article which appeared in the May 1978 issue of **SURFER MAGAZINE.**

Paumalu Earth Station

At the crossroads of the world



BY JOHN J. PETERSON

ACCORDING TO ISLAND legend, long ago, the youth called Kahikilani, Kauai's most noted champion surfer who loved to challenge dangerous waves and tides, was drawn to Paumalu, "the Receding Sea", (*Legends of Hawaii, Oahu's Yesterday* by Pilahi Paki).

Not many men could ride the waves of Paumalu which came ashore "in long sweeping swells, but with a subtle motion of crouching lulls and pouncing...like a wily panther creeping, secretly, to spring upon its prey." Many times Kahikilani tried to ride the unusual swells but failed.

*Mr. Peterson is Editor
of Pathways.*

Searching for the surf's origin, Kahikilani paddled his surfboard to Bird Island even though warned that the island was the home of the great Sea-serpent, the Puhipaka, who guarded the bird-maiden there. Singing birds soared and dipped in the sky each carrying leis to Kaiulani, the lovely girl who dwelt in the cave of Bird Isle protected by Puhi, the eel guarding the cave entrance while stirring up the waves that caused the panther-like surfs.

Seen and wooed by Kaiulani, Kahikilani forgot everything but the beautiful girl of Bird Island and they lived happily together for a long time. But the happiness could not last forever. The challenge of the mighty surf racing toward Paumalu was strong within him and he asked his love if he might not go to the

beach. With his promise that he would return very soon, and that he would not kiss another maiden during his absence, Kaiulani allowed him to go.

Conquering the surf, Kahikilani, King of the Surfers, was overcome by the adulation of those awaiting him on the Beach of Paumalu and accepted the lei and kiss of an admiring maiden. At that moment he forgot the love he had left on Bird Island. But the singing birds did not and carried the message to Kaiulani. Disguising herself as a crow she flew to Paumalu, snatched the maiden's lei from the neck of her lover, dropping hers on his shoulders, and whispering, "With this final lei of love, our happiness is over." As she soared from view Kahikilani bowed his head in shame.

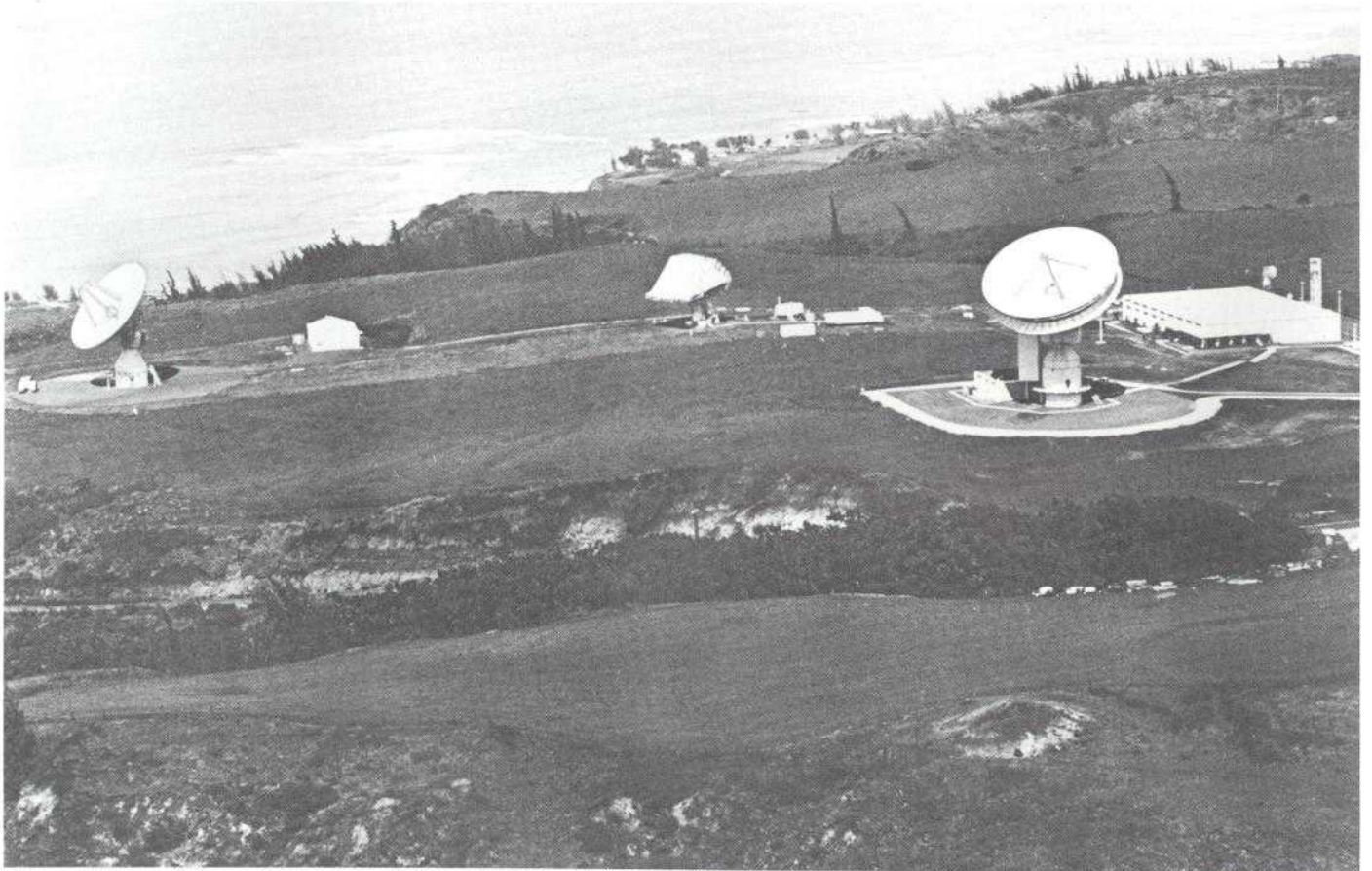
He tried to follow but he found himself unable to walk to his surfboard and to the sea. Instead, his legs would only carry him backwards toward the cliffs overlooking Paumalu Beach. From the cliff he could only watch as his love disappeared

into Bird Island and he was transformed into stone.

To this day it is said, if you look closely at the cliff formations, you can see Kahikilani, the Faithless Lover, wearing his crown of Lehau blossoms, with his face turned to the home of

his love, Kaiulani.

And if one looks a little closer and beyond the volcanic image of Kahikilani, the silvery-shining discs of COMSAT's Paumalu Earth Station can be seen peering out over the Pacific along with Kaiulani's lover.



The Paumalu Earth Station on the Island of Oahu in Hawaii.

The earth station complex at Paumalu is located about 40 miles north of Honolulu on the island of Oahu. The 237-acre tract is on a rolling plateau that overlooks the Pacific Ocean. The Paumalu facility is connected by microwave links to terrestrial networks serving Hawaii.

Other U.S. earth stations for international communications are located at Andover, Maine; Brewster, Washington; Etam, West Virginia; Jamesburg, California; and Pulantat, Guam.

The primary role of the Paumalu earth station is to

process communications signals which it sends to or receives from satellites stationed in synchronous orbit over the Pacific Ocean 22,240 miles above the equator.

The landmarks of the Paumalu station are its two dish-shaped antennas which stand taller than a 10-story building. The smooth surfaces of the dish reflectors were designed to such critical specifications that each antenna and receiver was tested and calibrated by listening to the known radio emissions from a star, Cassiopeia A, many light years away.

Centralized operation of the station is maintained in the control building which houses a maze of sophisticated equipment. Here skilled technicians constantly test and monitor performance of the station, control the antennas, operate equipment to re-route or bring up new channels, and coordinate operations with other stations in the Pacific network. The station operates around the clock.

All forms of communications are processed through the station at the speed of light (186,000 miles per second). The voice

quality of an individual telephone call is as clear as if it were being made from next door. Television, teletypewriter, high-speed data and facsimile are also of very high quality, meeting or exceeding rigid international standards.

COMSAT shares ownership of the Paumalu station with other U.S. international communications carriers. In an interim ruling in 1966, the Federal Communications Commission set the following ownership quotas for the Paumalu station: COMSAT, 50 percent; Hawaiian Telephone Company, 30 percent; RCA Global Communications, 11 percent; ITT World Communications, six percent; and Western Union International, three percent.

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

Editor's Note. This is the last in the series of features on COMSAT and COMSAT General's earth stations. Prior issues of PATHWAYS contain features on the earth stations located at Andover, Maine; Brewster, Washington; Etam, West Virginia; Jamesburg, California; Santa Paula, California; and Southbury, Connecticut.

Those interested in obtaining copies of any of these features should write to the Editor of PATHWAYS.

Riding the surf on Oahu's world famous North Shore.



Paumalu Station is located on Oahu's world-famous "North Shore" overlooking Sunset Beach, renowned for its 25- to 30-foot winter surf, and Waimea Bay where the first *haoles* (caucasians) reportedly stepped ashore on Oahu in 1779.

Much has been written of the attractions of the southern part of Oahu—Waikiki Beach, the Blowhole, Diamond Head, Pearl Harbor and the Punch Bowl, to name but a few—but if one were to draw a line approximately across the middle of the Island, say from Kaena Point (west) to Kaneohe Bay (east), and explore Oahu to the north, that portion of the Island in which the Paumalu Station is located, the visitor to this "Paradise of the Pacific" would find many points of interest, some well-known and some not so well-known.

Among the well-known is the Mormon Temple, almost a must for all of Oahu's visitors and a regular

stop for island tours. Not so well-known is the Place of the Sacred Birthstones near Wahiawa, a short distance off Kamehameha Highway on the way to Haleiwa, Paumalu Station's post office address.

Found in a pineapple field on the Waialua side of Kukaniloko Gulch, it is a place of special interest to anthropologists and students of Polynesian history. It was to this historic, half-acre plot that Hawaiian women of royal blood came to have their children.

According to *FODOR'S Hawaii*, the stones, protruding three feet above the ground, are vestiges of a maternity center whose origins are lost in the mists of time before recorded history. It is known, however, that Kukaniloko was used up to the time of the reign of Kamehameha the Great. The birthstone, called Kukaniloko, was the primitive equiv-

(Continued on next page)

Fingers of lava reach out into the ocean.



alent of a delivery table designed to support the woman in labor. The stones which surrounded the central stone were for the *alii*, the high chiefs and chiefesses of Oahu, who assisted at the birth like medical students in a contemporary operating room.

The 1,500-mile-long string of islands that makes up Hawaii is the most isolated of all the major island groups in the world—more than 2,000 miles from the North American continent, the Aleutian Islands to the north are only slightly less remote, while, to the south, the nearest high islands are the Marquesas, 2,000 miles away.

Author Edward Joesting, in his *Hawaii—An Uncommon History*, provides versions of the creation of the islands for both the romanticist and the scientist. For the romantic, Joesting relates the tale of the Islands of Hawaii as the children of the gods. The Mother of the Gods and the God of Light dwelt in the sky, and when their first child was born it dropped into the sea and became the island of Hawaii. Another child was conceived and became the island of Maui. The island of Kahoolawe followed.

After bearing these three children the Mother of Gods returned to Tahiti, but the God of Light remained, and by another woman the island of Lanai was born. By a third woman the island of Molokai was born. When the Mother of the Gods heard of this infidelity, she returned from Tahiti, and to spite her former mate she lived with another man. By him she conceived and bore the island of Oahu. At last the Mother of the Gods and the God of Light were reunited, and she became pregnant with the child which became the island of Kauai. Then followed the islands of Niihau, Kaula and Nihoa. The Mother of the Gods now became barren, and the creation of the islands of Hawaii was complete.

According to geologists, however, the island chain had its beginning at a time which can be measured only in the tens of thousands of years with the wrenching apart of the ocean floor followed by earthquakes and the creation of pressures forcing upward mountains of molten lava and ash. Above sea level the land was exposed to the elements and the buffeting of the ocean tides resulting in the island forms of today.

During the centuries European sailors hesitated to stray out of the sight of land. The Polynesians, aided by no navigational tools, freely roamed the Pacific Ocean in giant, twin canoes, canoes joined by a deck capable of carrying as many as 50 passengers and stores for colonizing, discovering and settling new-found islands thousands of miles from their native islands. These were the navigators that initially found their way to the Hawaiian Islands some 1,500 years before Captain James Cook of the Royal British Navy sighted the first island of the Hawaiian chain in January 1778.

Merze Tate in his book *The United States and the Hawaiian Kingdom* states the probability that the earliest American contact with the Hawaiian Islands was made in 1789 by a small Boston trading craft, the **Columbia**, under the command of Captain Robert Gray on his voyage from the Pacific northwest coast to China. His visit established a precedent for the Oregon-Canton trade route with the islands becoming an enjoyable refreshment and rest station.

Tate also points to the missionary influence as being significant in drawing the islands into the American sphere of influence. Although the primary interest of the missionaries was nonpolitical, their direct and intimate association with all classes of Hawaiians had its effect in presenting the American point of view. The most notable achievements of

the missionaries were the systemization of the Hawaiian language, the preparation of literature to be used in the churches and schools and the development of an educational system.

Symbolizing the missionary influence on the culture of Hawaii is the Mormon Church complex, a short drive along Kamehameha Highway from the Paumalu Earth Station. Situated in Laie, the complex includes the world-famous Mormon Temple, the Brigham Young University—Hawaii Campus, and the Polynesian Cultural Center.

Although the Temple is of relatively recent vintage (it was dedicated on Thanksgiving Day in 1919) the dignity of its architecture as well as its spacious and peaceful setting serves as a reminder to natives and visitors of the influence of the Mormon missionaries on the culture of the Islands. Initially erected in the form of a Greek cross at a cost of \$200,000, the Temple was remodeled tripling the capacity. Today's value of the structure is estimated at approximately \$7 million.

Adjoining the Temple is the Hawaiian Campus of Brigham Young University, formerly the Church College of Hawaii. The goal of the University as stated in the University Catalog "is to be a living laboratory where students from many nations and cultures have an opportunity to develop appreciation, tolerance, and esteem for one another." The University assumes a special responsibility to prepare qualified men and women who can live, serve, and contribute in Hawaii, the South Pacific, and East Asia. The result is a Mormon campus populated by various ethnic groups, and offering a cultural education as well as an academic one.

Probably no other setting in the islands tells the history of the Hawaiian culture more graphically

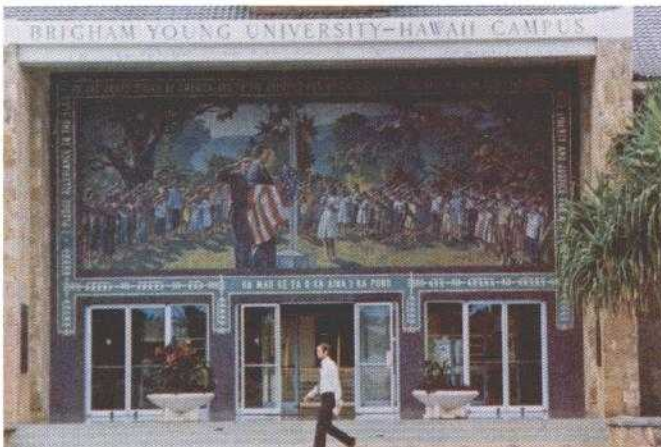
than the Polynesian Cultural Center in Laie. Opened in 1963, the Center is a show window for all Polynesia, a microcosm of the South Pacific, presenting authentic recreations of the island cultures of Samoa, Maori (New Zealand), Fiji, Tahiti and the Marquesas, Old Hawaii and Tonga.

Established as a non-profit educational and cultural activity of the Church of Christ of Latter-Day Saints (Mormon), the Center was created to portray the arts and crafts of Polynesia and to provide jobs and scholarships for Polynesian students attending the University.

The Mormon Church complex



The Mormon Temple was erected in 1919 at a cost of \$200,000. It is calculated that the extensively remodeled structure, if built today, would cost between six and seven million dollars.



Brigham Young University — Hawaii Campus serves students from throughout the South Pacific islands and offers both a cultural and an academic education.



The Polynesian Cultural Center depicts the island cultures of the South Pacific, recreated by the native students of the University.

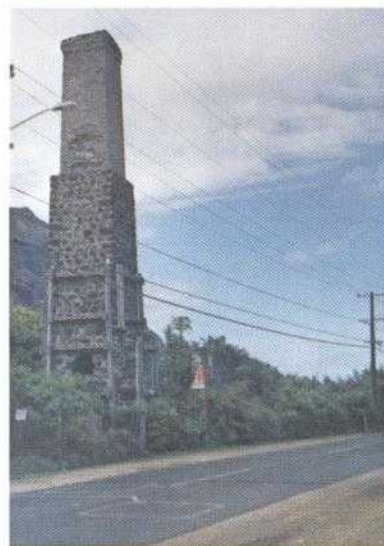
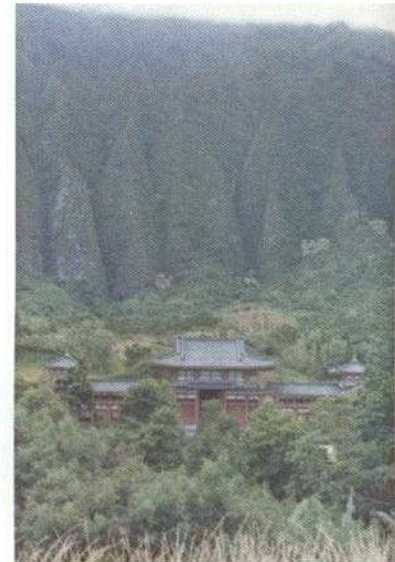
Legally, the State of Hawaii consists of eight major islands in the chain and 124 minor islands with a total area of more than 6,000 square miles with an additional 25 of inland waters. The state has a coastline of 750 miles. There are only three levels of government in Hawaii, Federal, State and County, and only four counties. Legal government is vested in one combined City and County (Honolulu, consisting of the Island of Oahu and numerous islets), three non-metropolitan counties (Hawaii, Kauai and Maui) and one area (Kalawao county). Each county has a mayor-council form of government.

Oahu constitutes the City and County of Honolulu. The county is unique in that its borders are not constituted of land mass but water. Honolulu is the seat of government for the State of Hawaii. In 1850 Kamehameha proclaimed Honolulu the capital city of his kingdom. It is still the capital and main city of the Nation's fiftieth state. Hawaii was admitted to statehood on August 21, 1959. It is the only American state that was once a kingdom ruled by its own native royalty.

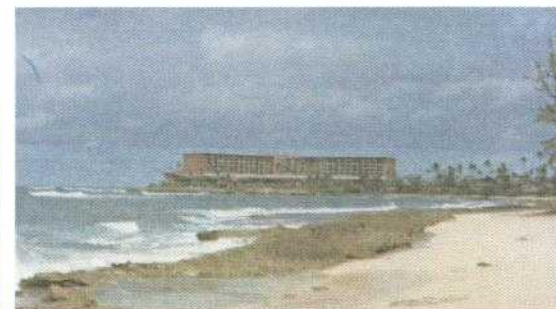
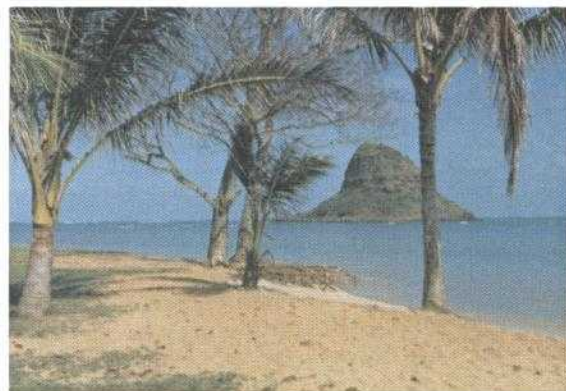
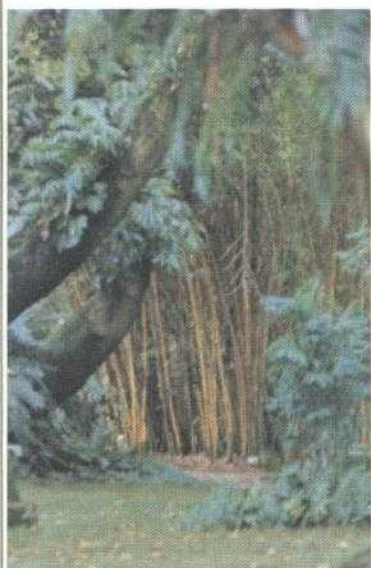
Like all the Hawaiian Islands, Oahu is noted for its easy way of life, at least in suburbia. Two sections, however, hum with activity, the downtown metropolitan area of Honolulu, and Waikiki, a miracle mile of hotels, shops, restaurants and clubs, once the playground of royalty and now the entertainment center for visitors and residents alike.

The third largest of the Hawaiian Islands is noted for its climate and recreation. Its major industries are tourism, government, construction, manufacturing, and agriculture. It is the state's only island where other economic activities overshadow agriculture—even though it has more land planted in pineapple than any other.

(Continued on page 7)



Many scenic points are within easy driving distance of Paumalu. Beginning at the upper left and moving from left to right are: Kolekole Pass view leaving Schofield Barracks; Liliuokalani Protestant Church with Paumalu's Bob Kumasaka in the foreground; Wahiawa Hongwanji Mission; Dole Pineapple Pavilion; newly planted pineapple fields; Byodo-In Temple in the Valley of the Temples; Army helicopters at Wheeler Field; ruins of Oahu's first sugar mill; Wahiawa Botanic Gardens; Chinaman's Hat; Kahuku Sugar Mill; ruins of St. Michael's Catholic Church; adjoining pineapple and sugar cane fields at Leilehua Plateau; and the Kulima Hyatt Resort Hotel on North Shore.



Island scenery varies from the parallel, 4,000-foot Koolau and Waianae Mountain ranges to the long stretches of sugar cane and pineapple fields which sometimes seem to descend to the sandy beaches and surf of the coastline. The Koolau Mountains divide Oahu into the Windward and Leeward sections with the dividing line the Nuuanu Pali where history relates King Kamehameha the Great defeated the Oahuan army in 1795 driving the enemy over the sheer cliffs to their deaths. Some 700,000 of the State's nearly 900,000 people live on Oahu justifying the name the early Hawaiians gave it—"The Gathering Place."

The Paumalu Earth Station looks over Oahu's world-famous stretch of surf known as "North Shore." Although "Waikiki" and "surfing" are interchangeable terms, each of which conjures up images of Hawaii as a surfer's playground, it is the surf stretching from Waimea Bay to Kawela Bay and the Kuilima Hyatt resort hotel at Turtle Bay—Oahu's North Shore—that attracts champion surfers from around the world.

South of Paumalu, champion surfers challenge the breakers of Sunset Beach, the longest stretch of wide beach on Oahu, and the "Banzai Pipeline," where, during the winter months, offshore waves reach tremendous heights with the crest of each thrown forward as it breaks, often forming an almost perfect tube. Where Kamehameha Highway turns inland at Kawela Bay, vacationers to the island can enjoy the culinary offerings of the Kuilima Hotel while witnessing the struggle of surfers riding the crests of waves into the beach at Kuilima.

But the North Shore offers more than just a romping place for surfing enthusiasts, it also offers a glimpse into the history of the islands.

Down the ridge from the Paumalu Station are the remains of the Puu O Mahuka Heiau (temple). An article in a 1970 issue of the Honolulu Star Bulletin recalls an event of almost 200 years ago.

"Today, the waves crash as they have always done, into Waimea Bay.

"Today, people sun themselves on the sand, or climb up on the big rock sticking out of the bay.

"But yesterday a sailing ship was anchored in the bay, the **Daedalus**, a store ship belonging to Captain George Vancouver's squadron.

"And on the cliffs above the bay, there was a temple dedicated to the war god Ku; on the altar of this temple Lieutenant Hergest, commander of the **Daedalus**, and two of his men are belived to have been sacrificed to Ku.

"The rock walls that the visitor sees comprise the largest *heiau* complex on Oahu, a *heiau* bigger than Kamehameha's famous *heiau*, Pukohala, on the Big Island. The rock walls are all that the visitor sees now, as the images, stockades, towers, houses and altars that were once a part of the temple have long been gone. Most of such appurtenances to *heiaus* were destroyed in 1819 on order of Liholiho, Kamehameha II, the year before the first missionaries came to Hawaii."

As it makes its way along the edge of Waimea Bay, where the first *haoles* (Caucasians) reportedly stepped ashore on Oahu in 1779, Kamehameha Highway presents a study of contrasts. On the Bay side huge surfs challenge the most experienced surfer but are a threat to swimmers; while on the inland side, Waimea Falls Park offers a natural, peaceful Hawaiian setting complete with a 45-foot waterfall, botanical gardens and a nature walk included among its 1,800 acres.

Several miles further south, approaching Waialua Bay, Kamehameha Highway makes a 90-degree

change of direction inland at Haleiwa, Paumalu Earth Station's mailing address. (Continuing west along the coast brings one to the Mokuleia Polo Field, Dillingham Air Force Base, noted for its glider flying, and the Coast Guard Station at Kaena Point, Oahu's westernmost point.) Here modern society and Hawaiian lore coexist along Haleiwa's main street—modern with its business section, post office and municipal building; historical in the form of the Liliuokalani Protestant Church.

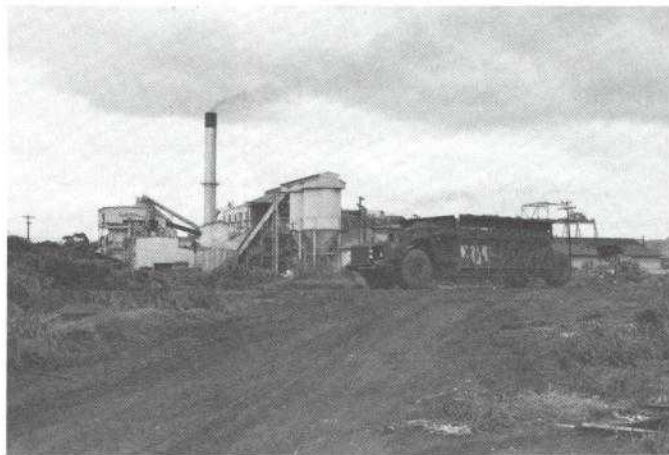
Still standing and serving its flock, the Liliuokalani Church first took form as a grass hut church in nearby Waialua. At its dedication in 1832 it was filled to overflowing—Chief Laanui issued a command to all the natives to be there.

In 1840 a second church, of adobe, was built and used not only for religious services but also for the teaching of Hawaiians who wished to become leaders of the church.

On the present site of Liliuokalani Church (now called Haleiwa), a third church was built in 1890 and was attended by Queen Liliuokalani who had built her summer home nearby. People made reference to the "Queen's Church" and the congregation took her name for the church. (The last of the Hawaiian monarchs, Queen Liliuokalani was a talented composer who wrote the island's haunting song of Farewell, *Aloha 'Oe*.)

In 1892 the Queen presented the church with a clock believed to be the only one of its kind in existence. In 1935 the church pastor, the Reverend Jerome Holmes, wrote of the clock, "In place of the regular numbers on the dial, the letters of the Queen's name are used. The largest hand indicates the days of the month; another dial gives the phases of the moon; and another the months of the year; leap year, the days of the week and

(Continued on next page)



Giant diesel carriers haul sugar cane to the Waialua Sugar Company mill. In the photo at left, a carrier hauls a load to be processed and, at right, returns empty from the mill for another load.

the weeks of the year are indicated. The calendar part of the works, by accident or intention, are in the shape of a cross." It is a wall clock 36 inches in diameter and one of the hands makes only one revolution in 36 years.

In 1910 a large stone archway was built at the entrance to the church grounds. On June 11, 1961, the fourth church building was dedicated. Over the entrance is a beautiful stained-glass rose window honoring the memory of the many church members who contributed to the building fund. The church bell, which was bought by the church members in 1833 and carried on the shoulders of strong Hawaiian men from Honolulu to Waialua, was taken down in 1945 when the old steeple would no longer hold its weight. It hangs again today in the Liliuokalani Church and regularly summons the congregation to services.

Hawaii's sources of basic income are the Federal Government (particularly the military), tourism, agriculture and manufacturing. Its great industrialized crops are sugar, valued at \$366 million in 1975, and pineapple, valued at \$137 million in 1975. Sugar and pineapple remain synonymous with Hawaiian agri-

culture and as one leaves Waialua and climbs the gentle grade between the Waianae and Koolau Mountain ranges toward Wahiawa, acre after acre of sugar cane hems in the highway until reaching the Leilehua Plateau.

Approaching the tableland of Leilehua, the green of sugar cane gives way to the darker, green-spiked leaves deployed row upon row for miles around like soldiers in formation. A stop at the Dole Pineapple Pavilion provides the opportunity to sample chilled fresh pineapple fruit and juice and to view a pictorial history of the growth of pineapple in Hawaii. Another mile further, at a fork in the road, a small pineapple garden is maintained featuring the varieties of pineapples grown around the world.

Another approach to the Leilehua Plateau is by way of Kaunokahua Road offering a view of vast expanses of sugar cane dominated by Mount Kaala, Hawaii's highest peak, more than 4,000 feet above sea level. From the summit, once a flat, dismal swampland and now a radome site for the Hawaii Air National Guard, all of Oahu lies spread out with the sky and sea becoming one. Mount Kaala was conquered by road builders who literally tied themselves to trees

and carved a road from its slopes.

Before one reaches Wahiawa, a dirt road angles off from Kamehameha Highway and carves its way through the pineapple fields toward a cluster of graceful eucalyptus trees. This is Kukaniloko, mentioned earlier in the story, the Place of the Sacred Birthstones, ground long held sacred in Hawaiian tradition. Established in the 12th century, it is one of the two famous birthplaces for royalty in the Islands. Originally two rows of stones, representing 36 royal chiefs were laid down with a mound for the royal mother-to-be on which her child would be born with honor.

Wahiawa, about a dozen air miles south of Paumalu, offers a variety of points of interest. Straddling the highway between the two forks of the Kaukonahua Stream, it has the appearance of a frontier town. Its population is considerably augmented by military personnel from nearby Schofield Barracks, the sprawling Army post made famous as the location for the novel and film *From Here to Eternity*, and Wheeler Air Force Base, where the first mainland-to-Oahu flight landed in 1927, and from where Amelia Earhart took off on the first flight from Hawaii to California, both of which came under

(Continued on page 15)

COMSAT has announced a number of organizational changes relating principally to COMSAT's international communications and technical services and to its research and development activities.

John L. McLucas has been elected Executive Vice President of COMSAT responsible for International Communications and Technical Services. Dr. McLucas had been President of COMSAT General Corporation, a COMSAT subsidiary.

John V. Harrington has been elected Senior Vice President, Research and Development; he had been Vice President, Research and Engineering.

Irving Goldstein has been elected Vice President and General Manager, International Communications; he had been Assistant General Manager, External Relations and Business

Development, International Operations.

Burton I. Edelson has been elected Vice President, Systems Technology Services; he had been Assistant Vice President and Director, COMSAT Laboratories

Mr. Goldstein and Dr. Edelson will report to Dr. McLucas, who also will be responsible for COMSAT's activities as the U.S. representative in INMARSAT—the International Maritime Satellite Organization, which is being organized to provide commercial maritime communica-

tions services beginning in the 1980's.

John A. Johnson, Chairman and Chief Executive Officer of COMSAT General, will serve also as President of the subsidiary, assuming responsibilities which had been handled by Dr. McLucas.

Reporting to Dr. Harrington will be Terrence P. McGarty, Division Manager of the Equipment Integration Division, and Louis Pollack, who will continue as Assistant Director but who will serve temporarily as Acting Director of COMSAT Laboratories.

COMSAT sells ownership in Cayey earth station

COMSAT has transferred the U.S. mainland-Puerto Rico satellite communications traffic from the INTELSAT global satellite system to the U.S. domestic satellite system and sold COMSAT's 50 percent ownership in the Cayey, Puerto Rico, earth station to All America Cable & Radio, Inc. (AAC&R), an ITT subsidiary, for the book value of approximately \$900,000.

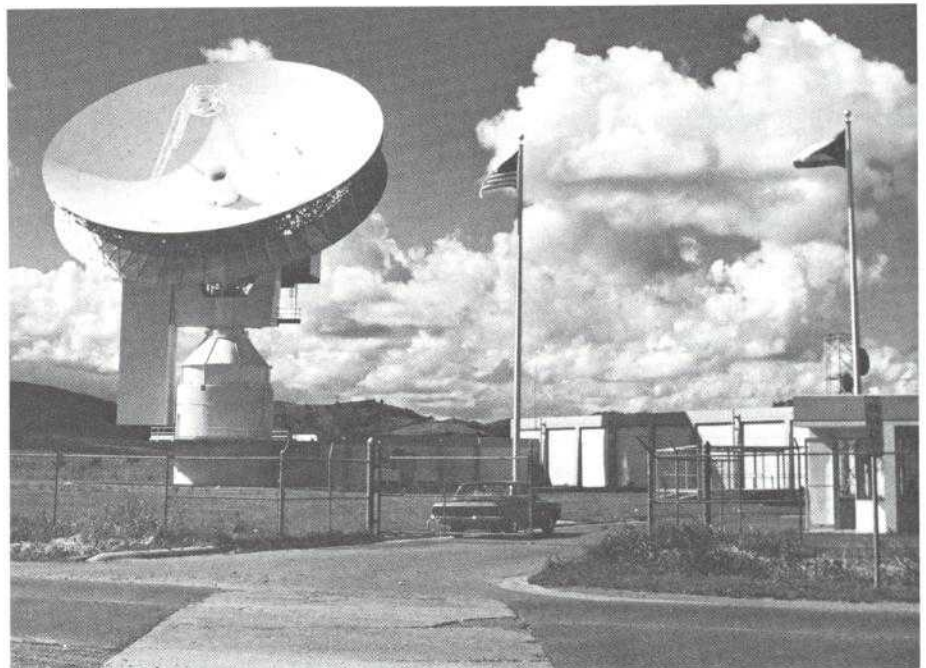
The remaining interests held by other U.S. communications common carriers also are being acquired by AAC&R.

The transfer of this traffic from the INTELSAT system and COMSAT's sale of its interest in the Cayey station had been anticipated for some years as the result of a Federal Communications Commission (FCC) policy permitting satellite traffic between the mainland and other U.S. offshore points, including Puerto Rico, to be carried via domestic satellite systems.

The Puerto Rico service had been the only sizable amount of U.S.-off-

shore traffic provided by COMSAT through the INTELSAT system in recent years. The mainland-Puerto Rico traffic accounted for approximately \$10.7 million or six percent of COMSAT's total operating revenues for 1978.

The mainland-Puerto Rico traffic was transferred to AT&T, which will provide service through the COMSTAR satellite system leased from COMSAT's wholly owned subsidiary, COMSAT General Corporation.



INTELSAT Board meets:

approves maritime packages for some INTELSAT Vs;

The Thirty-sixth Meeting of the INTELSAT Board of Governors was held in January, 1979. Among its key actions the Board:

- Decided unanimously to authorize the Director General to instruct Ford Aerospace and Communications Corporation (FACC) to proceed with the Maritime Communications System (MCS) program and to conclude an amendment to the INTELSAT V contract for the inclusion of MCS packages on the INTELSAT V (F-5), (F-6), and (F-7), this program having the following cost elements: delivery price, \$19,476,000; in-orbit incentives, \$5,962,329; equipment for INTELSAT evaluation, \$57,000, July-September 1978 study costs (including FACC recovery) not to exceed \$600,000. The Board noted that the amendment to be concluded will include options for incorporation of maritime subsystems on additional INTELSAT V spacecraft.

- Requested the Advisory Committee on Technical Matters to undertake at its next meeting a comprehensive review of the INTELSAT V program status, and report to the Thirty-seventh Board Meeting with its findings and views.

- Authorized the Director General to direct Ford Aerospace and Communications Corporation to proceed with work under Phase II of the Nickel-Hydrogen Battery Program at a delivery price of up to \$2,400,000 according to the terms negotiated with FACC, and to amend the INTELSAT V contract accordingly.

- Authorized the Director General to make appropriate changes in the INTELSAT V contract to provide a fifteenth INTELSAT V apogee motor, at a cost of \$297,000 plus incentives, and requested the Director General to recommend at an appropriate time the launch vehicle configuration that this additional apogee motor should

take.

- Approved applications for two non-standard Saudi Arabian earth stations subject to review by the Advisory Committee on Technical Matters and limited to operations with the Saudi Arabian domestic lease; and an experimental non-standard Australian station for demonstrations during the period February 5 through February 23, 1979.

- Requested the Director General to convene an extraordinary meeting of the Assembly of Parties on April 2-3, 1979, immediately prior to the Eighth Ordinary Meeting of Signatories, in Manila, Philippines, for the purpose of considering the advice of the Board of Governors with respect to consultations conducted under Article XIV(d) of the Agreement between INTELSAT and the ECS System and the Indonesia Palapa B satellite networks. This will allow the Assembly to express, in the form of recommendations, its findings within a period of six months from the date of commencement of consultations, as required by the Agreement.

operational spare in Indian Ocean Region

The Thirty-seventh Meeting of the INTELSAT Board of Governors was held in March 1979. Among its key actions the Board:

Technical and Operational Matters:

- On the basis of specific information, undertakings, and assessments, decided pursuant to Article XIV(d) of the INTELSAT Agreement to tender advice to the Assembly of Parties concerning the coordination of the proposed Palapa 3, 4 and 5 networks of the Palapa B system and the primary network of the European Communications Satellite (ECS) system that the proposed networks and their operation: are technically compatible with use of the radio frequency spectrum and orbital space by the

existing or planned INTELSAT space segment; will not cause significant economic harm to the global system of INTELSAT; and will not prejudice the establishment of direct telecommunications links through the INTELSAT space segment among all the participants. Both networks will require new coordination under Article XIV(d) if there is any material change in the technical parameters or operational scope or any material extension of such networks, beyond 1990 in the case of Palapa B and beyond 1992 for the proposed ECS network. The Board also decided, pursuant to Article XIV(c), to express in the form of a recommendation its finding that the operation of the Indonesian Domestic System utilizing the Palapa B networks is technically compatible with the existing

or planned INTELSAT space segment.

- Authorized the introduction of diversity operation in the Indian Ocean Region, utilizing the operational spare concept. The Board decided to consider again in September possible later introduction of two-satellite operation (Primary, Major Path plus spare) in the Indian Ocean Region.

- Revised previously authorized orbital locations so that the Director General may apply in a timely manner the appropriate ITU processes eventually leading to new registrations of INTELSAT IV, IV-A, V satellites, and of maritime communications packages.

- Decided to tender advice to the Meeting of Signatories, that the Danish domestic public telecommunications services in Greenland are be-

tween areas which are not linked by any terrestrial wideband facilities and which are separated by natural barriers of such an exceptional nature that they impede the viable establishment of terrestrial wideband facilities between such areas. With this finding, the Meeting of Signatories can determine that this traffic should be classified on the same basis as international service, pursuant to Article III(b)(ii) of the Agreement.

- Approved in principle the allotment of one-quarter transponder of space segment capacity to the Signatory of Colombia for a minimum period of five years, on a preemptible basis, at a charge of \$250,000 per annum for domestic public telecommunications services.

- Approved a two-month extension of free access to the space segment for the Automatic Seismic Installation Terminal at McMinnville, Tennessee, and a three-month extension for the experimental earth station at Goonhilly Downs, Cornwall, England; approved a Norwegian experimental earth station to operate with Norway's leased half-transponder, subject to specified operating conditions.

Financial and Legal Matters

- Decided that, in cases where its specific approval is not required by the Agreement or Procurement Regulations, approval of the annual budget confers authorization for the Director General to incur expenditures on budgeted items, provided that: no project may be divided into components in order to avoid the approval procedures which would be appropriate for the project in its entirety; and the Board will be advised in monthly and quarterly financial reports of expenditures on budgeted items, with particular attention to budget overruns. Further, these reports will detail any contracts which the Director General, pursuant to the Procurement Regulations, is authorized to award but which were not foreseen in the budget.



Confirmed by Senate

Mr. Jessie Hill, Jr., of Atlanta, Georgia, and Mrs. Joan F. Tobin of Washington, D.C., Presidential nominees to the COMSAT Board of Directors, were recently confirmed by the

Senate of the United States. Shown above are Hill and Tobin during hearings before the Commerce, Science and Transportation Sub-Committee on Communications.

- Adopted the INTELSAT Financial Statements for the year ending December 31, 1978.

- Decided that if the Signatories of Sudan and Mali are still in default under Article 7(c) of the Operating Agreement by close of business on March 26, 1979, their rights as Signatories under the Agreements shall as of that date be suspended pursuant to Article XVI(b)(ii) of the Agreement; that at such time as payment is received from them, their rights will be restored.

- Approved revised costs of \$1.912 million for INTELSAT-provided equipment for TT&C services through 1984, and a \$1.926 million increase to the 1979 capital budget. The Board also approved the award of a direct source contract to Codex Corporation of an estimated amount of \$118,225 for the provision of data transmission equipment for the TT&C network.

- Approved revised INTELSAT Principal Contract Terms and Conditions and INTELSAT Procurement Regulations incorporating editorial changes to reflect the coming into force of

permanent management arrangements.

Administrative and Organizational Matters

- Approved the following terms of assignment under the INTELSAT Assignee Program: a one-year term of assignment for Mr. Michihisa Ohkawa, a nominee of the Japanese Signatory, in the Planning and Studies Department; a one-year extension for Mr. Jean-Paul Berges, a nominee of the French Signatory, in the COMSAT West Coast Project Office; and a one-year extension for Mr. Roger J. Colby, a nominee of the U.K. Signatory, in the COMSAT Laboratories.

- Approved new positions within the Executive Organ of Member of Technical Staff, TTC&M Network Implementation Section; Assistant Cashier and Investment Officer, Finance Department; and two secretaries.

The INTELSAT reports were prepared by Ellen D. Hoff, Director, INTELSAT Affairs, International Communications.



ERT acquisition completed

Marvin Gaut, Chairman of the Board and Chief Executive Officer of Environmental Research & Technology, Inc., (left), and John A. Johnson, Chairman and Chief Executive Officer of COMSAT General (second from left), sign the documents concluding the acquisition of ERT by COMSAT General.



New Jamesburg Manager

A. J. Stotler, right, receives the key to the Jamesburg Earth Station from retiring Station Manager John Scroggs. Stotler, who has been with COMSAT since 1967, was formerly Manager, U.S. Plant, Headquarters, Washington.



Chinese delegation tours Labs

A delegation from the People's Republic of China tours COMSAT Labs and is briefed on new developments and projects being undertaken by COMSAT. In the photo above, Neil Helm of the Labs (at left) with the help of Dr. John Hsing who acted as the translator (second from left) describes some microwave test equipment to (left to right) Dr. Huang Feng-gan, Chem Yi-yuan, Dai Shizheng, Lu Cheng-wen and Ao Lin.



Global system described

COMSAT President Joseph V. Charyk (left) describes global communications satellite system to Ambassador Chai Zemin of the People's Republic of China (lower right) during his recent visit to the Plaza Headquarters.

The *Calypso*, whose scientific and oceanographic exploits worldwide are known to millions of television viewers, has been outfitted with a COMSAT GENERAL terminal for communications via MARISAT.

The terminal and a Magnavox navigation receiver were installed while the *Calypso* underwent extensive repairs and refitting in port at Marseilles, France. Under an agreement between the Cousteau Society and COMSAT GENERAL, the MARISAT terminal is being supplied by COMSAT GENERAL without charge for a period of up to three years.

And while the *Calypso* was being refurbished in Marseilles, even down to new mess furniture, the captain of the ship was ashore in COMSAT GENERAL's headquarters to sign the terminal agreement personally. Captain Jacques Yves-Cousteau also toured the COMSAT GENERAL telex switching center for MARISAT message traffic in the United States, and called the *Calypso* directly by telephone and telex.

"Jacques Yves-Cousteau vous appelle du Central COMSAT GENERAL

de Washington, est-ce Guy?" was the first message. Luckily, Guy was on the other end, and advised the Captain that repairs and preparations were going fine—"tout va bien."

Captain Cousteau also used the telephone on a test terminal in the switching center to talk to his crew directly via the Atlantic MARISAT satellite.

Looking to the future, Captain Cousteau said he was tremendously interested in an expedition up the Amazon River in Brazil. The Amazon has about 2,500 miles of navigable waters, a river system which drains dense jungle where one-fourth of the world's oxygen is produced. Cousteau also mentioned possible expeditions to the North Sea, the Persian Gulf and the Red Sea. Such expeditions, of course, would be chronicled on film, later to be shown on television in many countries.

But for the immediate future, Cousteau said in a March 15 interview, repairs will be completed on the *Calypso*, then tests run at sea in the Mediterranean, then two weeks leave for the 27-member crew in April.

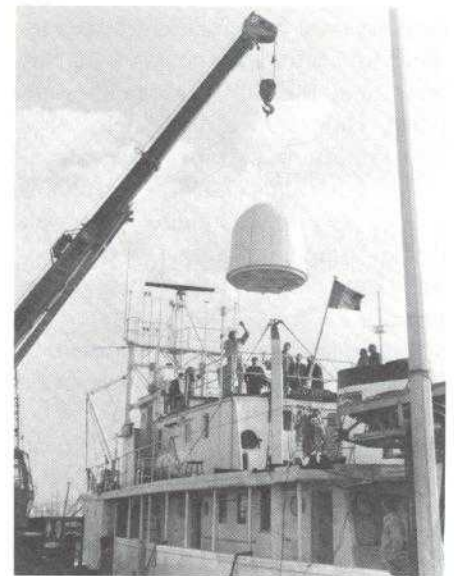
Cousteau tours the COMSAT General telex switching center at the Plaza Headquarters during his recent agreement-signing visit and writes a message for transmission to his ship via the Atlantic MARISAT satellite.



Odyssey of the Calypso



Noted undersea explorer Jacques Yves-Cousteau makes use of COMSAT General's MARISAT to talk with the Calypso in Marseilles, France, during his Plaza visit.



While the Calypso underwent repairs and refitting in Marseilles, a COMSAT General terminal was loaded aboard.



NOTES FROM PERSONNEL

BY HOLLY PRYATEL

Job evaluation program

Does anyone remember the job questionnaires that we had to fill out way back in 1975? If so, you might be wondering what happened to them.

They *did* serve a purpose—they were the basis for writing job descriptions for what was then a new compensation program. Hay Associates were chosen by management to help us set up a job evaluation program. The Hay consultant trained several employees to write key job descriptions from the questionnaires and then set up our structure around these key jobs. Eventually every position in the company had a formal description.

What is a compensation program? It is a system of paying people for performing work for the organization. To determine a fair rate of pay, the compensation program which fixes a dollar amount of a job's worth is established. Job evaluation is the means by which we determine a job's relative value within the organization. Once the descriptions are written, the jobs are related to each other and to outside firms, and the dollar amount established. Job evaluation, then, is a very important part of our compensation program. The Hay system is one of several techniques for evaluation—another example is the Federal Government's classification system.

Two committees were formed in COMSAT to create and maintain the job evaluation program. One committee evaluates exempt positions; the other evaluates non-exempt positions. It is the function of these committees to evaluate new jobs or re-evaluate existing jobs when warranted according to an established set of criteria. The factors used in analysis are 1) know-how, 2) prob-

lem-solving and 3) accountability. The committees look at the skills required to do the work, and the duties and responsibilities of the job. It must be stressed that jobs are evaluated, not the person in the job. There are no names on the job descriptions that are analyzed.

Upon consensus of the committee, points are assigned according to the number and value of factors in a job. These points in turn determine a salary midpoint around which a salary range or the lowest to highest monetary value placed on a job is constructed. The committees *do not* determine individual people's salaries and *do not* know the midpoint results from the evaluation.

Some of the jobs analyzed in the committee meetings are re-evaluations. These occur upon request of a manager only if the responsibilities or the skills required to do the job have significantly changed. If a job seems to warrant a re-evaluation, a Position Description Form, CSC 1193, can be obtained from Personnel; the job rewritten, and submitted with nine copies to the Compensation and Benefits Department. If a position is new, the job description should be submitted along with a Regular Employee Requisition, CSC 189. When the position has been evaluated, the requisition will go to the Staffing Department to begin recruitment. The committees generally meet once a month.

Vacation time

With the arrival of spring our thoughts usually turn to vacation planning. If you're wondering how many vacation days you have coming for the year you can check the computerized leave report furnished each division and earth station. This re-

port will let you know the vacation time, sick leave, personal absences and holidays you are entitled to.

The vacation policy (SPI 70-301) explains eligibility requirements. Briefly, if you are a full-time regular employee, hired before June 1, you are eligible for five days vacation after six months of service. If hired after June 1, you must wait for the next calendar year at which time you become eligible for 10 vacation days after six months service. In the second through the fourth calendar years you are entitled to 10 vacation days; in the fifth through the ninth, 15 days; and 20 days in the tenth through the nineteenth year.

Vacation days are granted as of the first day of each year with the expectation that you will continue your employment with the company through the year. You earn vacation days, however, each month. So, if you voluntarily terminate and have taken your full eligibility but were only entitled to a part of it, you must reimburse the company for the excess taken. In turn, the company will pay you for days earned but not used.

You are encouraged to use your vacation each year—everyone needs the rest and change from the pressures of work. Finally, make sure your vacation plans are coordinated with and approved by your supervisor.

Educational assistance

As a reminder to those of you who will be finishing school courses in May of June, when you applied for educational assistance on CSC 187, Educational Assistance Application, the Training Department returned the yellow copy to you. To get your tuition reimbursement, return this copy with a copy of your grade(s) and receipt of payment (it can be a cancelled check) to the Training De-

(Continued on page 17)

Ms. Pryatel is an Employee Relations Specialist in the Personnel Office.

PAUMALU

(Continued from page 8)

heavy attack on the morning of December 7, 1941. Looming over Schofield is the Waianae Mountain range and the gap made by Kolekole Pass through which enemy planes poured to attack the sleeping military garrisons on that fateful Sunday.

Two of Wahiawa's points of interest recommended for visits by Oahu guide books are the Wahiawa Botanical Garden and the Hongwanji Mission. The Botanical Garden includes 27 acres, four acres of which are under cultivation complete with marked paths, benches and shelters. The Garden is a place for quiet reflection where one can wander the paths enjoying the beauty of trees, grass and flowers or sit in admiration of tall and stately trees, wide and spreading trees, or exotic shrubs.



Station Manager G. M. Vinquist

There was little difficulty getting in to see the temple even though it is not always open to the public. A knock at the living quarters door resulted in the Reverend Norito Nagao's providing his gracious and informative daughter Arlene for a guided tour of the temple. Founded in 1908, the existing temple was completed in 1949 with the front portion added in 1962. At the front end of the Temple a statue of Amida Buddha looks upon the congregation from an altar of Japanese cypress.


It is a leisurely drive of but a few miles from the Earth Station to the northernmost tip of Oahu to Kahuku Point before starting southward on the island's eastern side toward Honolulu with many attractions in between. The 87-year-old restored sugar mill at Kahuku now presents itself as a tourist attraction, in sharp contrast to the active, producing mill at Waialua, south of Paumalu, easily located from afar by following the direction of monstrous cane haulers streaming toward the high smoke stacks in Wauaalua, often with only their diesel exhaust stacks visible above the fields of cane.

The Kahuku Sugar Mill today tells the story of Hawaiian sugar with a guided tour of the plant and a multi-screen film presentation. The one-time sugar mill now provides space for 36 shops and restaurants, one of which, the Cane Train, features a buffet and souvenirs of early rail-roading days in Hawaii.

Continuing south past the Mormon Church complex to Hauula, a five-mile diversion inland is climaxed with a view of the Sacred Falls which plunge 87 feet from a cliff into a gorge forming a pool of crystal clear water. The Sacred Falls are not easy to reach, however, and hiking ability and weather are factors to be taken into consideration in order to reach the site. Another few miles and a roadside Hawaiian Visitors Bureau (HVB) marker at Kaaawa identifies the stone ruins of Oahu's first sugar mill erected in 1864.

Arriving at Kualoa Point, one should take a detour through Kualoa Regional Park. From the park there is a magnificent view of Kaneohe Bay punctuated by Chinaman's Hat (Mokolii Island) rising more than 200 feet out of the water. The island received its name because of its resemblance to the hat worn by early Chinese plantation workers. The island is the result of wave action as a

drastic form of coastal erosion and is called a "sea stack". Visible at the far end of the bay is Mokapu Point housing air and ground forces of the United States Marine Corps.

From Kaneohe it is but a half-hour's drive through the wind-swept Koolau Mountains via the historical Nuuanu Pali and the downward side into Honolulu. 

Paumalu Highlights

1965

December—Groundbreaking ceremonies attended by COMSAT officials, members of Hawaii's Congressional delegation and local government and business leaders.

1966

July—Station control building completed.

September/October—Initial group of technicians reported for duty.

November—Inaugural live telecast between the U.S. Mainland and Hawaii.

December—Transportable van/antenna became operational; 85-foot antenna (Paumalu 1) put into service.

1967

January—TT&C station played key role in tracking/positioning on INTEL-SAT II (F-2); Paumalu 1 used for acceptance tests; Inauguration of Pacific satellite service.

1968

January—Began construction of Paumalu 2 antenna.

September—Glenn M. Vinquist assigned as station manager replacing William L. Miller who was reassigned to Headquarters.

December—Paumalu 2 antenna became operational.

1969

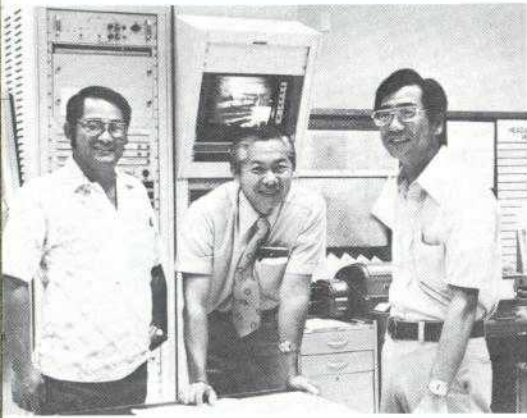
February—Participated in successful INTEL-SAT III (F-2) launch.

April—Paumalu 2 antenna formally dedicated.

June—Transferred traffic from INTEL-SAT III (F-3) to INTEL-SAT III (F-4).

(Continued on page 17)

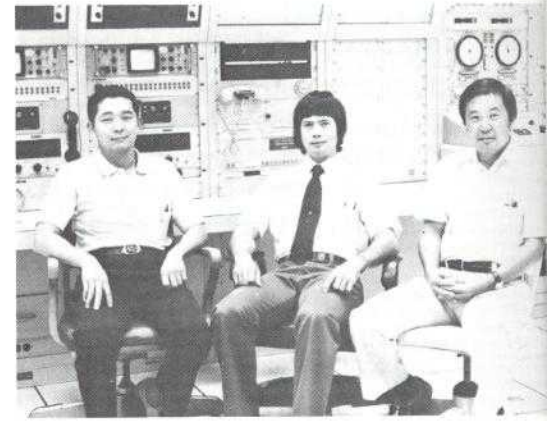
Paumalu staffers with decade of COMSAT service



*Senior Technician Ronald Miyasato
Electronic Maint. Sup. Charles Wong
Station Engineer Kenneth Yamashita*



*Senior Technician John Vollrath
Senior Technician Timothy Kolb
Operations Sup. Richard Senones*



*Senior Technician Thomas Ota
Operations Supervisor Allan Prevo
TTC&M Supervisor Eddie Miyatake*



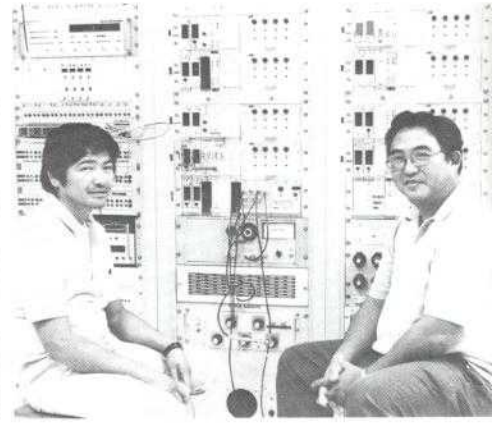
*Facilities Supervisor Joe Chow
Sr. Facilities Mechanic Robert Manske
Mechanics Helper Edward Clarke*



*Operations Sup. Charles Ogata
S. Technician Norman Murakami*



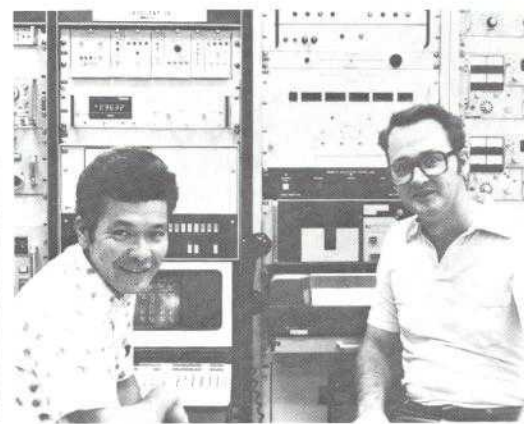
*Caster R. Corpuz
Facilities Painter*



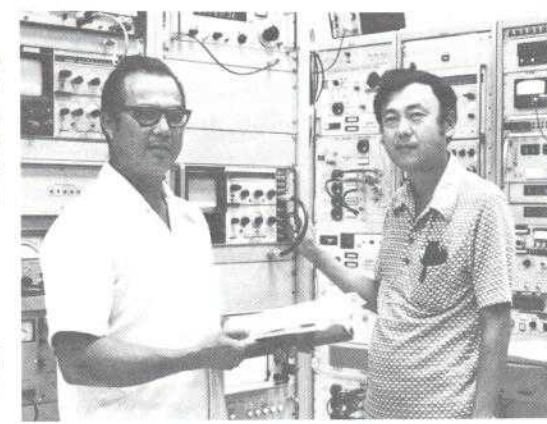
*Senior Technician Norman Kato
Senior Technician Yoshiaki Daikoku*



*Mat'l Control Spec. Robert Makizuru
Accounting-Personnel Clk Lily Miram
Administrator Robert Kumasaka*



*Senior Technician Paul Koike
Senior Technician William Osborn*



*Operations Supervisor Stanley Holt
Senior Technician Paul Motoyama*

PAUMALU HIGHLIGHTS

(Continued from page 15)

1970

December—Inaugurated service with Bartlett, Alaska, station.

1971

April—Construction of BPS/Hydra-mech building completed.

1972

January—Participated in successful INTELSAT IV (F-4) launch.

February—Transferred traffic from INTELSAT III (F-4) to INTELSAT IV (F-4).

December—SCPC service inaugurated with Jamesburg for circuit from University of Hawaii to Ames Aeronautical Labs in California.

1973

July—Hosted a seven-member study group from the People's Republic of China.

August—Participated in successful INTELSAT IV (F-7) launch.

September—SPEC (Speech Predictive Encoding Communication) System installed for field tests at Paumalu and Brewster.

1974

November—Participated in successful launch of INTELSAT IV (F-8).

December—Transferred traffic from INTELSAT IV (F-4) to INTELSAT IV (F-8).

1975

August—TT&C equipment relocation completed.

September—COMSAT Labs' experimental 15-foot reference antenna installed for use in polarization measurements.

1976

January—Modifications to Paumalu I antenna drum room completed.

May—Installation of MARISAT antenna completed.

Note—During 1976 participated in the successful launches of INTELSAT IV-A (F-7) in January; COMSTAR D-1 in May; MARISAT (F-3) in June; and MARISAT (F-4) in October.

1977

May—Participated in successful launch of INTELSAT IV-A (F-5).

1978

January—Participated in successful launch of INTELSAT IV (F-3).

June—Paumalu I antenna used for the last time in the conduct of in-orbit acceptance tests for COMSTAR D-3.

Editor's note. *Appreciation is extended for the assistance given in the preparation of the Paumalu feature by Station Manager G. M. Vinquist and the station staff, to Station Administrator Robert Kumasaka for laying the considerable groundwork necessary to the research process, to the Hawaii Visitors Bureau for providing very complete background data, to the researchers and staff librarians of the Hawaii State Libraries in Honolulu and Waialua, and to the personnel of the Library of Congress in Washington, D.C.*

PERSONNEL

(Continued from page 14)

partment. The information will be processed here and sent to Accounting where your refund check will be made.

If you will be going to summer school, submit the Educational Assistance Application about two weeks before classes start. If you want prepayment of tuition, submit the form at least three weeks in advance. Also, for prepayment, write a memo to the Training Department explaining the need for prepayment and how much is desired, up to 70 percent of total tuition. Your Supervisor must approve this request. If the course is not satisfactorily completed, you will be required to return any tuition amounts that were advanced to you.

MARCH-APRIL 1979

CCU Annual Meeting



Members of the COMSAT Credit Union meet at the Plaza and are briefed by Credit Union President James H. Kilcoyne. The meeting was concluded with the election of officers for the new year.

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

Terri Myers

Southbury

Eileen Jacobsen

BREWSTER. Our station has a new look—the canteen, offices and some of the hallways of the control building have been repainted with bright, new colors, and, with the new drapes installed last summer, it all looks very attractive.

Station Manager **Wally Lauterbach** and wife **Doris** recently returned from a trip in their mini-home visiting old friends in California and Arizona. Wally reported good weather and lots of golf on lots of courses.

Jack Wohlford recently received his 10-year service award. **Jerry Bowes**, Station Administrator, spent his Washington's Birthday holiday with his family skiing in Vernon, B.C. —**Dorothy Buckingham**

Brewster bikers

Shown in the photos at the bottom of the page, from left to right, are Jack Wohlford, Mel Tate, young Jim Wohlford and Mel Tate, Jr.

Evil Kneivel—No!, look again, it's Jack Wohlford and Mel Tate, senior facilities mechanics at Brewster. Their hobby, motocross racing. Jack, a member of the Washington (state) Chapter of the Oldtimers Motocross Association (for persons over 40 and willing to admit it) has raced in six international events and won trophies in four of them. A second place in Edmonton, Canada, was his best. Mel competes in the Over-the-Hill Gang of Washington (for motocrossers over 30 and looking forward to 40). Mel has raced in four international events, winning trophies in three of them—his best, a second place.

Their interest in this sport started when their sons, Jim Wohlford, age 12, and Mel Tate, Jr., age 8, expressed their desire to ride motorcycles. The families started riding trail bikes and spent many happy hours riding the thousands of miles of trails through our beautiful State of Washington. Jim and Melvyn Jr. are mini bike racers now and are among the top contenders in their class. Even

Mom is involved, mending racing gear, keeping lap times, racing scores and scrap books, and cheering them on to the checkered flag.

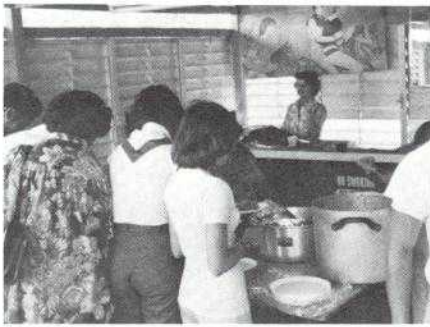
Their latest motocross adventure was the highlight of their racing when they were invited to race the first annual Hi Point Amateur Supercross in the Kingdome, Seattle, Wash. This is a new and different kind of competition for amateur racers.

Two weeks before the race, final preparation began in Mel's garage. Jack, Mel and their sons spent their spare time overhauling, modifying, and tuning their bikes for this special race. Three days were spent at the Kingdome, two days attending riding seminars and watching the world's top pro riders race. Neither Jack nor Mel won the race, but the experience will help them when they race with their clubs to defend the World Cup Trophy held by the Washington Old Timers in May. Good luck!

CAYEY. A typical puertorrican "Fiesta" was held recently sponsored by the CCEA. The annual party celebrated the "octavitas" which traditionally take place after Three Kings Day. Station personnel and the mem-

Candid shots of the Cayey "Fiesta"





bers of their families enjoyed lots of good food, games and witnessed the awarding of a perfect attendance certificate for 1978 to **Jose M. Carriles, Sr.**, by Station Manager **L. R. Rodriguez**.

Luis Ruiz, Junior Technician, passed his Second Class FCC examination and took to himself a bride since the first of the year. Senior Facilities Mechanic **Arsenio Reyes** has been at home suffering from successive virus attacks. **Otto Irizarry**, Operations Supervisor, has become a real 35mm shutterbug and hopes to be supplying some good photos for PATHWAYS use in the near future.

—E. V. Castro

ETAM. Senior Technician **David Cross**, a COMSAT employee of nearly five years, has resigned from COMSAT to accept a position with Ameri-

can Satellite. His departure left the chairmanship of the ECEA open. **Henry Bulk** was elected to fill the office.

Robert Grimm has joined our staff as a Junior Technician. Bob is a bachelor and resides in Uniontown, Pennsylvania. **Mary Jo Funk** recently joined the Advance Security Company's staff here at the station in a custodial position. Mary Jo and her husband Mike live within walking distance of the station. **Roscoe Hill**, employed in Visitors' Control by American Security since Etam became operational, has retired.

Mike and Elfriede O'Hara, avid racing fans, attended the Daytona races recently. The ECEA sponsored a cold cut luncheon in March in the canteen in honor of St. Patrick's Day.

—Bev Conner

JAMESBURG. Station Manager **John P. Scroggs** has retired. Replacing Scroggs is **A. J. Stotler**, formerly Manager, U.S. Plant, Headquarters. The Jamesburg CEA sponsored a retirement party for John and his wife **Louise** at the Rancho Canada



Retiring Station Manager John Scroggs receives enlarged station picture from JCEA President Don Palmer (right) in photo above and an engraved digital watch from Walter Robinson (left) in photo below.



Golf and Country Club. The original station manager, John was presented with several gifts including an enlarged picture of the station and an engraved digital watch. He also received numerous retirement greetings from personalities throughout the Corporation. John expects to remain in the area except for some traveling.



Station Manager Scroggs presents the Ten-Year Service Award to A. R. (Roy) Scheiter (right) in photo above and a One Year Service Award to Allan Mayland, Jr., in photo below.



David N. Bulk (right) receives a Safety Award check from Walter Robinson.

—C. B. Marshall

LABS. The Chess Tournament is in progress with 16 participants. At this reporting time the tournament was in its second round and so far we have seen some very tough and competitive matches.

Ten-Year Awards were presented to **Francois Assal, Gary Gordon, Thomas Dobyns, Bernard Free, Ronald Stegens, George Szarvas, Edmund Rittner, William Getsinger, William Hutchens, Thomas Kirkendall, Floyd Bland and Claudette Tucker.**

Neil Helm and **Bill Megna** spent 10 days in Kitzbuhl, Austria, skiing the Alps and having a marvelous time. They also took a side trip to Munich, Germany, to take in the sights.



Neil Helm (above) and Bill Megna on a ski trip in the Austrian Alps.



Former Labs Director B. I. Edelson (left) receives a gift of appreciation from Pete Carlson for the Labs' continuing support of the Upper Montgomery County Athletic Club.

Five-Year Awards were received by **Daniel McAuliffe, David Perlmutter, Nelson Jacobus, John Reisenweber, Kurt Boehm, Jewel McCaa, John Rosso, Vasilis Riginos, Sally Speicher, Louis Stephens, William Childs, Vanessa Pennington, Ruben Guenther, Norman Moran and Kitma Yeh.**

Deserving of special mention is **Richard Smith** who completed 15 years with COMSAT. A formal awards presentation is scheduled for May.

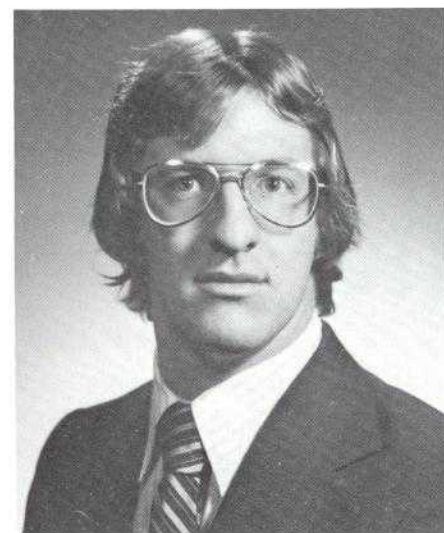
Shirley Taylor has a new grandson, **Jason Paul Miller**, born in Seattle, Washington, in February. **Gloria Moore** will soon be moving into her new home in Clarksburg. Congratulations to **Brenda Hollar** on the arrival of a new son, **Jason Eugene**, in February.

Among the new hires at the Labs are **Barry Ross, Jerry Hoopert, Michael Chakarji, Vernon McKinnon, Steven Garber, Marvin Sassler, David Walton, David Weems, John Forrer, Michael Serafinas, Frank Dabrowski, John Curran, Herbert Blair, Dennis Long, Harold Silverman, Patrick McCracken, Patricia Fletcher, Lawrence Solarczyk, John McKenna, Earl Main, Michael Hofe, Harry Miller, Ralph Ambrose, Robert Parker, Charles Arvin, Sharon Draper,**

Victor Serafini, Belinda Haddock, Sharon Properzio, David Handy, Jack Piontek, Steve Gray, Lawrence Biller, Lester Rochester and Chris Mercer.

The CEA cross country ski trip to New Germany Park was a success even though only a few participated. According to **Kim Kaiser** the ski party enjoyed good food, good company, lots of snow and, since the highway had become impassable, an additional day of skiing. Kim hopes for a better program next year and greater attendance.

Thomas M. Hyde, son of **Dr. and Mrs. Geoffrey Hyde**, has been awarded a University of Pennsylvania scholarship for five years of study towards a joint MD and Ph.D in neuro-anatomy. The scholarship



Thomas M. Hyde

provides full tuition for medical and graduate schools and an additional \$4,000 annual stipend. —B.P.S.

M&S. The position of Director and Business Manager of the M&S Center has been taken over by **W. T. Patterson**. New additions to the M&S staff are **Long T. Ngo, Clyde Fleming, Susan Thompson and Edgar Richards.**

Early vacationers this year were **Pierce** and **Ann Stine** who headed for the warm and sunny shores of Florida in their motor home. **Betty** and **Turk Hall**, with their daughters, also visited Florida taking in Sea World,

Disney World and the Daytona 500.

The safety film for the month was "Bridges from No Place" presented by the Safety Committee (cokes and popcorn were on the house). **Jim Vienneau** of the Cryogenic Shop conducted a class for AT&T's **G. A. Cunningham** of Three Peaks, California; **Vernon D. Morris** of Woodbury, Georgia; **Melvin H. Seely** of Hawley, Pennsylvania; and **Roger L. Wachter** of Hanover, Illinois.

During the recent snowstorms, **Bob Hamilton** and **Chuck Jenkins**, using four-wheel-drive vehicles, volunteered several days of service transporting medical personnel between their homes and Suburban Hospital in Bethesda and Fredrick Memorial. —**Darleen Jones**

PLAZA. After 10 years as Director of Congressional and Government Relations, **Gus Rauschenbach** has departed COMSAT for his retirement home in Florida.

Mosetta Blackmon, Manager of Staffing, Personnel, has taken a position with the Marriott Corporation as a Senior Compensation Analyst. "Mosie" joined COMSAT in 1974.

Personnel's **Steve Parker** picked a good time to vacation with his wife

at St. Croix—the snowy month of February.

Brett Bicksler, son of El Segundo's **Bill** and **Barbara Bicksler**, recently received the highest rank attainable in Scouting, that of Eagle, Boy Scouts of America. —**Mary Lane**

SANTA PAULA. We at Santa Paula feel more fortunate than our eastern counterparts this time of the year; at what other station can one go out and pick an orange from a tree while enjoying a view of the snow-capped foothills of the Sierra Nevada?

We suspect the cold eastern weather had something to do with the recent visit of the Plaza's **Harry Gross**—perhaps the need to thaw out. Secretary **Pat Hogan** and husband **Jack**, a Western Airlines pilot, recently returned from Mexico City.

Station Manager **Dan Geer's** group finished second in their class in a sailing race from Los Angeles to Puerto Vallarta, Mexico, a distance of 1,200 miles (Dan picked up a great tan while at it, too).

Along with the other signs of spring comes the new vehicle fever which seems to envelop the staff. Technician **Steve Beane** just took delivery of his long-coveted Harley

Davidson motorcycle, **Dennis Hill** is driving a new red Austin Healy Sprite and Maintenance Technician **Charlie Kraft** has acquired a new Chevy Luv truck (happy payments to all). —**Terri Myers**

SOUTHBURY. The station is getting a fresh look with the application of interior paint. COMSAT blue is still the prime color in the equipment areas with off-white and pastel green accents in the administrative and MARISAT Operators's areas.

Three pairs of bald eagles have been showing their feathers over the station and local bird-watcher clubs have been congregating outside the station.

The MARISAT Operators have been receiving correspondence from Captain Reinhardt of the *Al Hasa*—and a beautiful Dutch calendar. **Nam Bok Cho**, radio officer of the *Donghae-Ho* has been corresponding with (his "esteemed American mother") MARISAT Operator **Agnes Tomlinson**. Agnes has been sending him English language books and dictionaries to aid him in the study of our language. She recently received a silk-embroidered screen from Hong Kong in appreciation. —**Eileen Jacobsen**

ADDENDA

COMSAT to provide INTELPOST support

COMSAT has reached agreements totaling more than \$455,000 with the postal and telecommunications administrations of France, Germany and the Netherlands to provide them with technical assistance for their participation in the INTELPOST program this year.

INTELPOST is an international electronic message service concept initiated last year by the U.S. Postal Service. The INTELPOST system is

designed to facilitate international mail service by providing high speed, transoceanic transmissions via INTELSAT satellites of letters and documents, which would be delivered in hard copy.

To prepare for participation in INTELPOST, France and Germany are contracting with COMSAT for technical assistance in testing, training and integrating the hardware and software each country will purchase.

Under the agreement with the Netherlands, COMSAT will purchase hardware and software, per-

form system integration and training, and bring the INTELPOST system into operation for that country.

1979 graduates

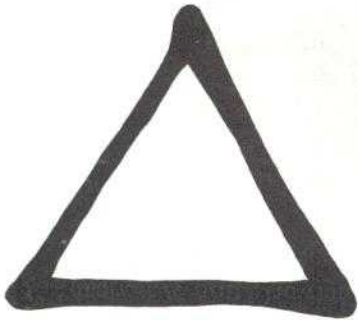
As in previous years, PATHWAYS will again carry a listing with pictures of the 1979 high school and college graduates, the sons and daughters of COMSAT, COMSAT GENERAL and INTELSAT employees.



Pathways

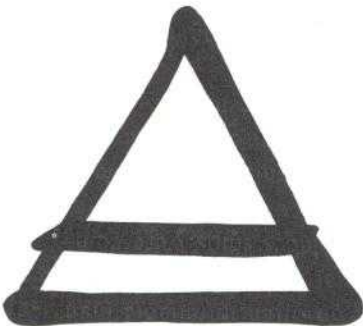
SATELLITE

May-June 1979
Volume 4 Number 3



ERT

*Environmental
Research
and
Technology
Joins
the
COMSAT
Family*



Pathways^{SATELLITE}

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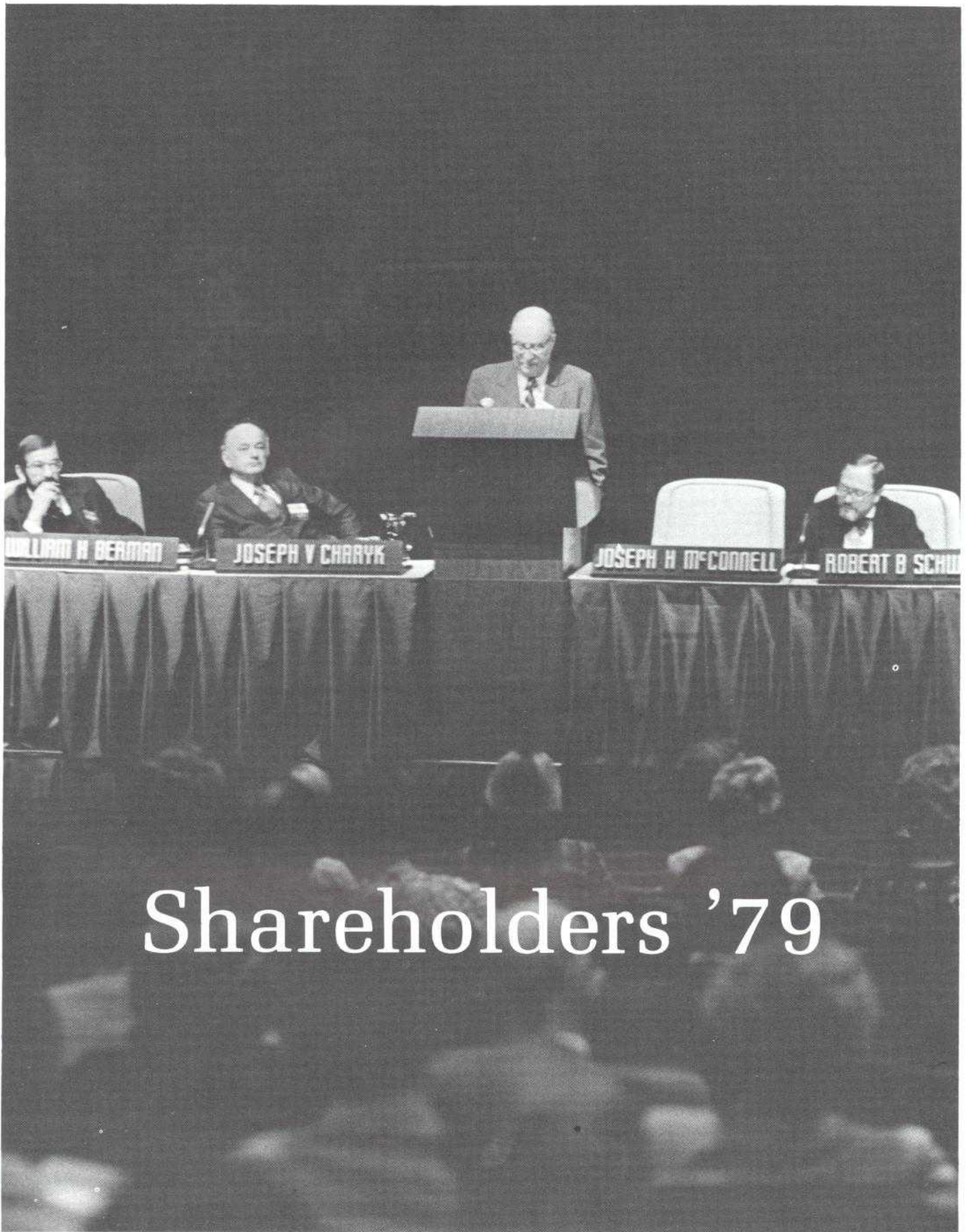
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CORPORATION 1979

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Cover. Inspired by the cover designs for a number of its brochures, the use of the photographs and symbols provide a representation of Environmental Research and Technology's principal concern, the environment. The symbols themselves, on the left, are ERT's stylized version of the symbols from alchemy for earth, air, fire and water.



Shareholders '79

REPORT OF THE CHAIRMAN

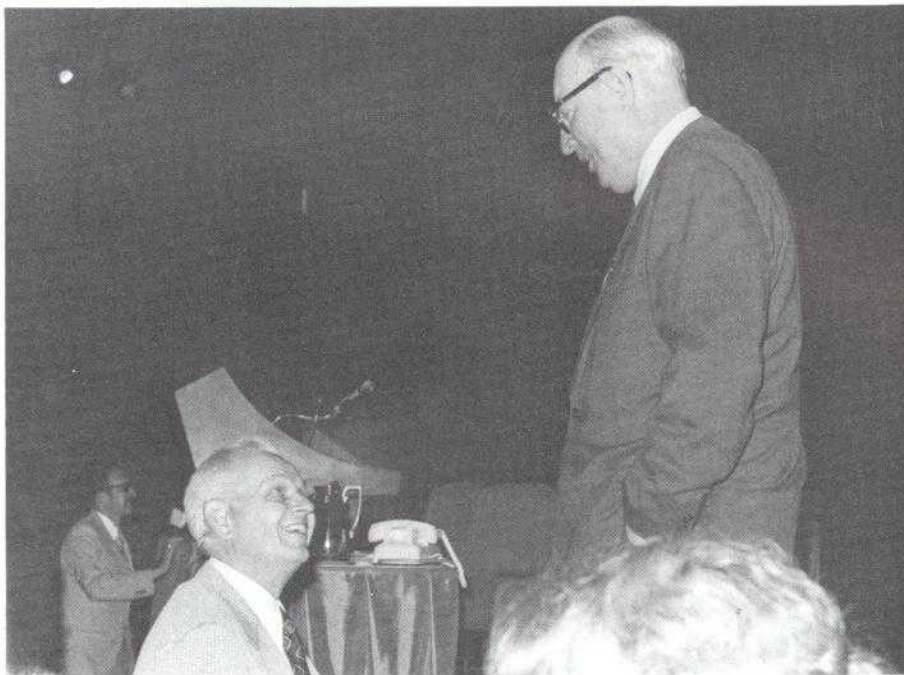
It has been my pleasure to serve as Chairman of the Board for the past nine years. These have been challenging years, in which we have had some successes as well as some disappointments.

As you may have noted in an announcement last January, I will be retiring from the chairmanship of your company after this meeting. As I step down, I cannot resist the temptation to think back and recount how far we've come in this short span of time. I want you to know that I am neither so immodest nor so stupid as to think these occurrences all happened because I was Chairman. I am merely delineating them to you because they happened while I was Chairman.

In 1969, ships at sea depended on often unreliable high frequency radio communications dating back to the early part of the century. And in many places ships were completely out of touch. Today, because of our initiative in establishing the MARISAT system, ships in virtually every corner of the globe can be in instant communication with land by means of a system whose reliability rivals that of any terrestrial system.

In 1969, the Government was still debating its policy on domestic satellites, and there was no domestic satellite service. Today, three of our COMSTAR satellites are providing service in the domestic network, for American Telephone and Telegraph and General Telephone and Electronics Corporation.

And Satellite Business Systems, our partnership with IBM and Aetna, perhaps better known as SBS, is fast



Chairman of the Board McConnell chats informally with a shareholder during annual meeting.

PHOTOS BY BILL MEGNA

But taking a few moments to look back serves a real purpose. Knowing where we've been sharpens our perception of the future. Knowing how far we've come encourages us as we seek to expand our business and increase its profitability.

In 1969, the year before I became Chairman, operating income contributed about 25 percent of our total Net Income, the remainder coming from temporary cash investments. Today, operating income is contributing more than 83 percent.

In 1969, our only source of operating revenue was the INTELSAT system. Today, we have a much larger revenue from our INTELSAT services, we have a substantial stake in maritime and domestic satellite services as well, and we are entering new fields.

approaching the day when it will be able to place in service a sophisticated and innovative domestic system—a type of system that was not even envisioned in 1969. SBS is one of our most ambitious projects. Its importance goes far beyond COMSAT and its partners because the SBS system will be a unique addition to the nation's communications capability.

In 1969, the INTELSAT system was operating under tentative, interim arrangements, and the organization had 70 member countries. Today, INTELSAT is operating successfully under permanent arrangements, and its membership has grown to 102 countries. The system is providing the majority of the world's intercontinental communications.

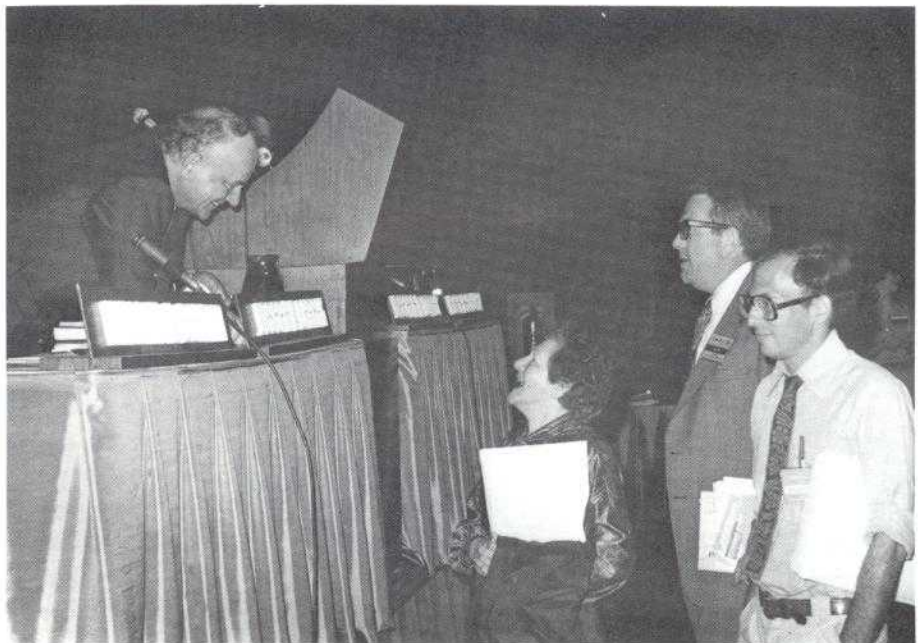
(Continued on page 4)

REPORT OF THE PRESIDENT AND CHIEF EXECUTIVE OFFICER

Thank you, Mr. Chairman, for those kind words. I know I speak for the shareholders and employees in expressing appreciation for the leadership you have provided during the years of your chairmanship. You are too modest in disclaiming any individual credit for the Corporation's record growth and accomplishment over the last nine years. And I am pleased that we will have the continued benefit of your advice and guidance as a member of the Board of our Corporation.

At last year's Annual Meeting, we pointed to the attention we were giving to the expansion of our business in the communications satellite and related fields—both through internal growth and business acquisitions. Since then we have taken significant steps toward that end.

COMSAT President Charyk responds to questions from shareholders following the formal business of the annual meeting.



Yesterday we consummated the acquisition of Environmental Research & Technology, Inc., a company based in Concord, Massachusetts. Through ERT, we will enter the growing environmental information services field. This field is especially attractive to us because it is one in which satellite technology can play a significant and, in some respects, an essential role.

ERT provides a full range of services and advanced monitoring systems that enable clients to meet environmental standards and regulations. A large portion of its business is devoted to the collection of data on air and water quality, the transmission of this data to computer facilities for processing, and the dissemination of this information to clients. Satellites can forge the communications links that tie these operations together. The combination of ERT's expertise in gathering and processing

environmental data and our expertise in satellite communications will enable us to fashion sophisticated monitoring and data transmission networks. We are confident that the result will make our offerings in the environmental services market highly competitive.

I want to take this opportunity to introduce ERT's President, Dr. Norman Gaut, who is with us this afternoon. Dr. Gaut is a distinguished scientist who already has made ERT a successful business. We welcome him and all of the ERT officers and employees to COMSAT and look forward to a fruitful association with them.

We have also moved to broaden our activities on another front. As a byproduct of the research and development work performed by COMSAT Laboratories, we now

have a number of components and systems that we feel can be marketed successfully to segments of the telecommunications industry. This year we formed a new subsidiary—COMSAT GENERAL TeleSystems, Inc.—to develop and manufacture a variety of these specialized telecommunications products.

We have received a number of orders for echo canceling equipment and we expect to offer other signal processing equipment, earth station components for low-cost operation, and terminal equipment for fiber optic communications. Even at this early stage, we are encouraged by indications that there may be a sizeable market for these products.

(Continued on page 5)

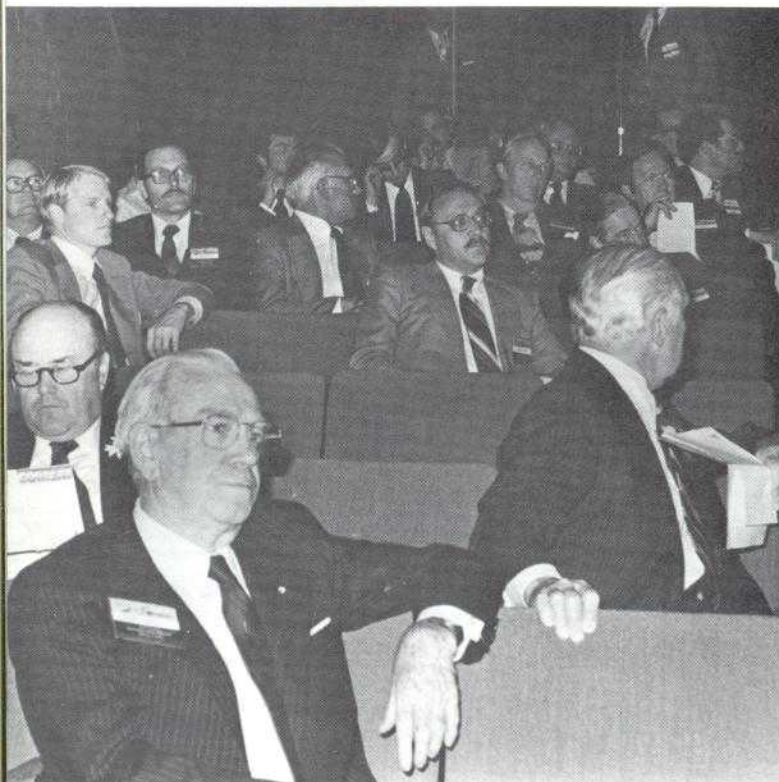
McCONNELL

In 1969, a single INTELSAT satellite had capacity to provide 1,500 circuits plus television. Each of today's satellites has four times that capacity, and INTELSAT soon will have satellites with double the capacity of today's satellites, or 12,000 circuits plus television.

With the large increase in circuit capacity produced by our technology, unit costs have declined steadily. And with greater use of the satellites, the cost of international communications to the public has declined dramatically, and is continuing to decline despite spiraling inflation in virtually every other arena of our economic life.

For example, in 1969, the cost of a three-minute telephone call to London was \$12. Today, that same call can be made for about \$3.80—or less than a third of the cost in 1969.

COMSAT rightly can take major credit for the astounding leap in the world's communications capability and the great economies it has produced.



John D. Harper (foreground), elected Chairman of the COMSAT Board of Directors following the meeting, listens to presentations.

On the financial side, our record is also impressive. In 1969, when we provided only INTELSAT system services, operating revenues totaled \$47 million. In 1978, operating revenues, including revenue from our COMSTAR and MARISAT systems operations as well as our INTELSAT system services, reached a record high of nearly \$185 million—almost a four-fold increase from 1969.

In 1969, our Net Income totaled \$7.1 million or 71 cents per share on ten million shares outstanding. In 1979, despite substantial reductions in our rates for INTELSAT system services, our Net Income reached \$34.2 million or \$4.28 per share on eight million shares outstanding.

This amounts to an increase of nearly 500 percent on a dollar basis and about 600 percent on a per share basis since 1969.

In 1969, the Corporation was not yet paying dividends. We began paying them in 1970 and have increased the rate eight times since. Last month the Board increased the quarterly amount 15 percent to 57.5 cents, so that we are now paying at the annual rate of \$2.30 per share. That's more than three times the amount of our total Net Income Per Share in 1969.

Turning to comparisons of more recent periods, our Net Income of \$34.2 million for 1978 was 5.4 percent ahead of 1977 Net Income, on greater revenues from all three of our principal services. Both Net Operating Income and total Net Income increased despite the substantial rate reductions for INTELSAT system services that were required by the settlement of our FCC rate case.

For the first quarter of this year, as reported last month, our Net Income totaled \$1.49 per share—an increase of more than 53 percent from the first-quarter last year.

When we announced our first quarter operating results, we noted that growth in our INTELSAT system traffic allowed us to make a further reduction in our rates for INTELSAT system services. Since then we have announced a general 15 percent reduction in the rates for those services. We hope that this reduction will contribute to an even greater use of the satellite system—for the benefit of both the ratepayers and our shareholders. We are pleased, especially in these inflationary times, to be able to continue the pattern of decreasing costs and rates which, as I emphasized earlier, is an impressive characteristic of satellite communications.

In these, my last remarks to the shareholders, I have concentrated on the successes we have had over the years. We have also had our share of disappointments. For example, we went through a protracted rate proceeding and we came out with less than we had sought. And some of our proposed programs did not materialize. We are also facing the challenge of some legislative proposals which we consider to be against the interest of COMSAT. Dr. Charyk will talk about them in some detail. But we are fortunate that our successes have overshadowed our disappointments. And, we can truly take heart from the knowledge that our accomplishments have been impressive and that our organization has been resilient, responsive and capable of meeting its challenges at every turn.

(Concluded on page 6)

CHARYK

We are also pleased by the prospect of continued, steady growth in our commercial maritime communications services—even though, for some time, we expect these revenues to account for only a small portion of our total operating revenue. We anticipate that services to the Navy through the MARISAT system will end in the early 1980s. However, our commercial maritime satellite activities will continue beyond MARISAT.

In the 1980s we will begin to provide such services through a global system to be established by the International Maritime Satellite Organization—INMARSAT. We are pleased that the Congress passed legislation in 1978 that designates COMSAT as the sole operating entity to participate in INMARSAT on behalf of the United States.

The legislation provides that COMSAT will furnish interconnection arrangements for direct access by customers to the INMARSAT system. In effect, the Corporation will be a participating carrier in the system rather than restricted primarily to the role of carrier's carrier as in its INTELSAT operations.

The INMARSAT organization will come into existence by the middle of this year. The agreements set an initial capital ceiling of \$200 million, although at this time we do not know what portion of this amount will actually be expended. We have chosen to acquire an initial INMARSAT investment of about 30 percent. However, the initial share we do receive will depend on how many shares are assumed by the other INMARSAT participants. Our initial share could be reduced to a minimum of 17 percent or it could go higher than 30 percent. After the start-up phase, a participant's investment share in the new organization will be adjusted periodically to approximate its use of the system, as in the case of INTELSAT.

We look forward to working with our INMARSAT counterparts in the months ahead. Because of the Corporation's work in establishing the MARISAT system, the U.S. will be entering the new organization with more practical experience in the field of maritime satellite communications than any other nation. This new venture promises to be an exciting one for the Corporation as INMARSAT builds on the achievements of MARISAT in developing a global market for maritime satellite services.

Of our new programs, Satellite Business Systems is the most innovative. The system is designed principally to provide businesses and government agencies having substantial communications requirements with sophisticated internal voice, data and video communications services. SBS's marketing efforts have advanced to the point where it is nearing its first formal customer commitments for service.

SBS is continuing to work toward the establishment of its system by 1981 while legal issues connected with the

venture are being resolved. At issue before the U.S. Court of Appeals is whether joint entry in the domestic communications field by COMSAT and IBM would violate the antitrust laws. As we mentioned in the annual report, in August of last year a three-judge panel of the U.S. Court of Appeals reversed an FCC authorization for construction of the SBS system and returned the matter to the FCC for further proceedings. SBS and the FCC sought rehearing by the entire Court of the panel's decision. We are happy to report that last week the full Court set aside the panel's decision and agreed to take a fresh look at the antitrust question.

Last month, in another action, the Common Carrier Bureau of the FCC recommended approval of SBS's application for construction of tracking, telemetry and command facilities for the SBS system, subject to final



Dr. Norman E. Gaut, left, President of newly-acquired Environmental Research & Technology, Inc., registers prior to annual meeting.

resolution of the antitrust issues before the Court of Appeals. SBS expects to award construction contracts soon for the new facilities. We are pleased that the FCC has indicated its willingness to grant the authorizations necessary to enable the system to go into operation in 1981, as planned, while the legal issues are being resolved.

(Continued on next page)

McCONNELL

In January, the Board elected Dr. Charyk as Chief Executive Officer; he will continue to be in charge as President and Chief Executive Officer. In January, Mr. John Harper was elected as Vice Chairman of the Board. It is being proposed that he be elected Chairman of the Board at an organizational meeting later this afternoon.

The Company and the Board could not be left in better hands. Dr. Charyk has served as the Corporation's President from the very day of its founding, in 1963. In my opinion, Dr. Charyk is the leading world authority on satellite communications. He is a Ph.D. in nuclear physics, graduating summa cum laude from California Institute of Technology, was professor of physics at Princeton University, was Under Secretary of the Air Force, and has been our President, as I have said, since the beginning of the Company. The rapid and dramatic development of our business since that time is both tangible proof of and a tribute to Dr. Charyk's leadership.

Mr. Harper is one of the most highly regarded busi-

nessmen in the country and a friend of mine of long standing—although a vigorous competitor for many years. He has been a Director of COMSAT since May, 1973. But he made his most enduring mark in the course of his distinguished life-long career—46 years—with the Aluminum Company of America—ALCOA—from which he retired as Chairman and Chief Executive Officer in 1975. Mr. Harper has many distinguished honors. Among these is the chairmanship of the Business Round Table—one of the most important and significant contributions of business to our welfare.

As I complete my stewardship of the Company, I thank Dr. Charyk and Mr. Harper, as well as the other directors and officers, for their support over the years. I want to thank you, our shareholders, for your support of the Company, and as I go, I wish all of you, not just continued success, but success far beyond that which we have achieved, which I am sure will come about. Thank you and goodbye.

CHARYK

Although we have taken important steps to develop the business along new lines, we must do more in this respect as the form and content of our business activities change. The rate regulation of our INTELSAT business is such that, even with substantial growth in traffic, we cannot expect a corresponding growth in revenues. Indeed, our revenue picture may bear little relation to traffic growth. In addition, the COMSTAR program and our maritime service to the Navy, both under contract, are of limited duration. But all of these programs generate large amounts of cash. We must apply this cash to new activities and ventures that will enable us to continue our pattern of growth.

We also face challenges—no less formidable—on other fronts. The fortunes of COMSAT, as a creature of the Congress, are more dependent on changes in national policy than perhaps those of any other single company. For some time there has been talk of a major revision of the communications laws, including the Communications Act of 1934 and the Communications Satellite Act of 1962. There are now three bills pending in the Congress with this objective in mind.

One bill, cosponsored by Senators Goldwater and Schmitt, would have the effect of codifying a more formal process for planning future international satellite and cable facilities. We regard this as a desirable objective. Also under this bill, competition would be promoted in our industry only in those areas where it would prove practical and beneficial. Existing institutional structures and reg-



Shareholders gather COMSAT and ERT literature prior to opening of Annual Shareholders Meeting in the L'Enfant Plaza Theatre.

ulatory mechanisms that serve the public interest would be retained.

Another bill, introduced by Congressman Van Deerin in the House of Representatives, has a number of provisions that we think are undesirable. For example, the

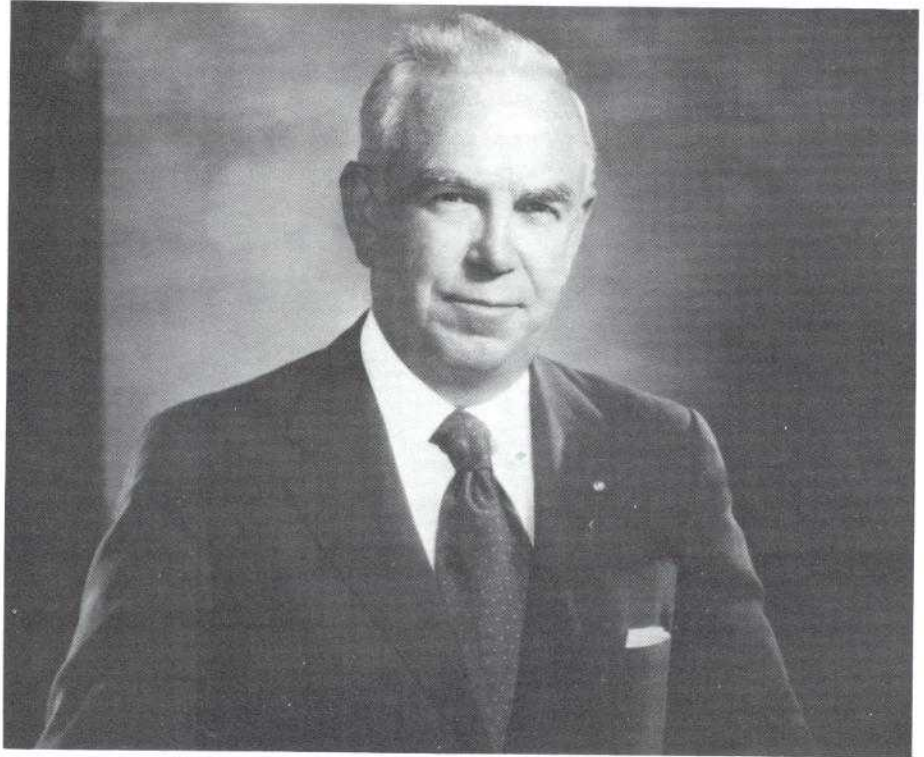
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Shareholders elect directors

COMSAT shareholders elected twelve directors, all incumbents, at their Sixteenth Annual Meeting, on May 15, in Washington, D.C.

At an organizational meeting of the Board of Directors, which followed the Annual Meeting, Joseph V. Charyk was re-elected President and Chief Executive Officer of the Corporation, and John D. Harper was elected Chairman of the Board. Mr. Harper succeeds Joseph H. McConnell, whose retirement as Chairman was effective at the Annual Meeting but who will continue to serve as a member of the Board. Mr. Harper, who has been a director of COMSAT since 1973 and Vice Chairman of the Board since January of this year, is a retired Chairman of the Board and Chief Executive Officer of ALCOA.

Other directors, in addition to Joseph V. Charyk, Mr. Harper and Mr. McConnell, who were re-elected are: Gordon Edwards, William W. Hagerty, John A. Johnson, Melvin R. Laird, Howard J. Morgens, Ellmore C. Patterson, Charles Pilliod, Jr., Bruce G. Sundlun, and William L. Zimmer, III. There was one nomination from the floor: Lillian Levy, a Washington science writer, failed in her sixth attempt to become a member of the board.



COMSAT Director John D. Harper elected Chairman

The twelve shareholder-elected directors plus three Presidentially appointed directors form the Board of Directors of COMSAT. The Presidentially appointed directors are:

Jesse Hill, Jr., George Meany, and Joan F. Tobin. Mr. Hill and Ms. Tobin were appointed by President Carter late last year and confirmed by the Senate in March.

CHARYK

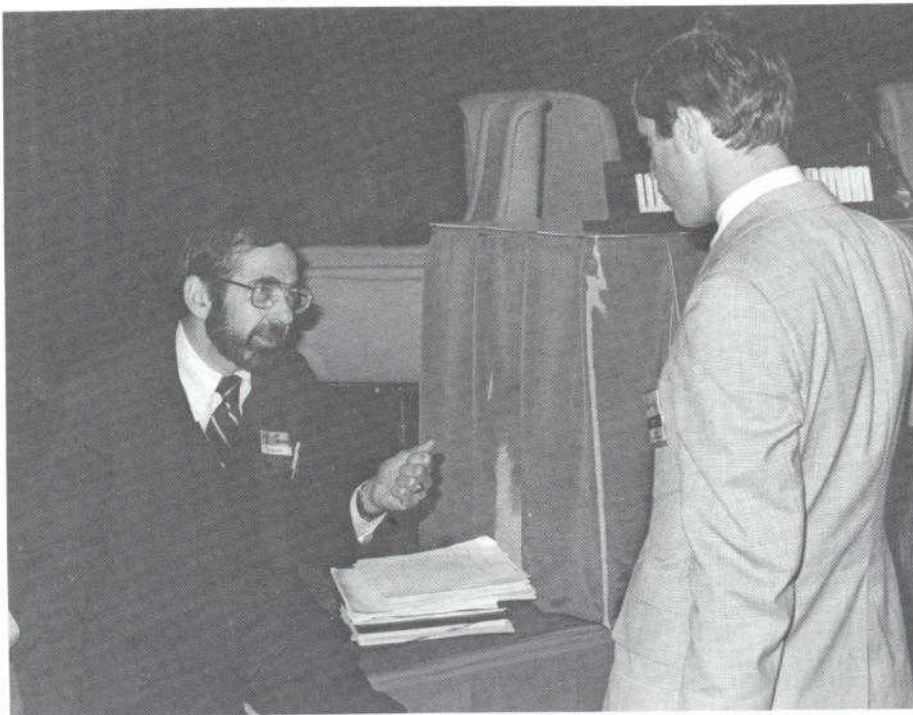
Van Deerlin bill would deregulate international facilities planning, construction and use. This would give the other U.S. carriers a much freer hand in establishing international facilities like new underseas cables and in using those facilities heavily without first demonstrating that they would serve the public interest. In fact, facilities could be constructed without prior approval from a regulatory agency like the FCC so long as they were not vetoed by the President of the United States within 90 days for reasons of foreign policy or national security.

Under the Van Deerlin bill, COMSAT would remain the U.S. participant in INTELSAT. But the U.S. position and the INTELSAT system itself might be undercut since other carriers would apparently be free to participate in the establishment of regional satellite systems separate from INTELSAT. COMSAT theoretically would be free

to compete for the business of retail customers, using both cable and satellite facilities. However, the bill ignores the fact that AT&T's monopoly telephone service accounts for nearly 80 percent of all U.S. international circuits. I have made these observations in testimony before Congressman Van Deerlin's subcommittee, and indicated that the existing system, which includes important recent improvements in the planning process, should instead be given a chance to work.

The third bill, introduced by Senator Hollings in the Senate, proposes a far more drastic solution, one that poses a far greater threat to COMSAT. A new non-profit International Facilities Management Corporation would

(Concluded on next page)



COMSAT Vice President and General Counsel William H. Berman discusses legal matters with a shareholder.

CHARYK

be instituted to participate with foreign administrations in planning, constructing and operating all international communications facilities, both cable and satellite. COMSAT's duties as U.S. representative to INTELSAT would be transferred to this new corporation.

All U.S. international facilities, including COMSAT's current share of the INTELSAT system, would be transferred to a single facilities owners consortium, and ownership in that consortium would be on the basis of use. Since COMSAT has functioned, pursuant to U.S. Government policy, as a carrier's carrier and serves virtually no end users, we estimate that COMSAT would put into this consortium about 25 percent of all U.S. international facilities and would acquire only a one to two percent interest, based on usage, in the new U.S. consortium.

COMSAT would be paid in cash for the remainder, but would lose its INTELSAT revenue stream. It would have the opportunity to compete with all other carriers for end user business, but due to AT&T's monopoly over nearly 80 percent of total U.S. international communications services, it is unrealistic to assume that in such a situation COMSAT would over time become a large user of international services and thereby expand significantly its ownership within the consortium.

I have testified before Senator Hollings' subcommittee that I believe the effect of the bill would be to lessen competition rather than promote it. The existing intermodal competition between cables and satellites would be undermined, and COMSAT, the one entity dedicated solely to the development of satellite technology, would be

virtually eliminated from the scene. I also testified that I could not believe that one risk the COMSAT investors were assuming back in 1964 was that, once the global satellite system had achieved both economic and technological success, it would be taken away from COMSAT by the government that had set the policy and encouraged stockholder participation in the first instance. I indicated that if the international portion of the Hollings bill were to become law, the financing of ventures similar to COMSAT in the future with private capital would be unrealistic.

On behalf of the shareholders of this company, who waited long and patiently for their investment to bear fruit, we will do all within our power to dissuade the Congress from adopting legislation that would weaken or threaten COMSAT's position in the industry. We will continue to press our case vigorously.

I have outlined some of the major challenges confronting the Corporation. Of course, we are bound to meet with some frustrations and disappointments as we seek to preserve our position and widen the sphere of our operations. But this will also be a time of opportunity for the Corporation. And we certainly have a wealth of resources to draw upon.

We have substantial cash and our technological know-how in the field of satellite communications is unsurpassed. But perhaps our greatest asset is the creativity and diligence of our management and staff. Their talents have placed the Corporation in an excellent position to take full advantage of opportunities and to build on our substantial record of growth and accomplishment.



COMSAT enters field of environmental services with acquisition of ERT

Introduction

The article that follows is meant to provide a brief history of Environmental Research & Technology, Inc., known as ERT, and a review of its strong record of accomplishment in environmental services.

Following affirmative votes of the shareholders of both COMSAT and ERT, the Concord, Massachusetts-

based company officially became part of the Corporation on May 15, 1979. ERT joined COMSAT as a subsidiary of COMSAT GENERAL and is functioning as a separate line of business within the COMSAT organization.

Dr. Norman E. Gaut, one of ERT's founders, remains in the position of President, and he now reports to a

"I believe that this joining of forces with ERT will broaden and enhance our activities and services and the opportunities for personal growth. I believe that together we will continue to expand, to prosper, to pioneer, to innovate and to be leaders in our fields."

Joseph V. Charyk

new ERT Board of Directors consisting of seven people including himself. The other six are Robert B. Harlan, Jr., and James P. Mahoney of ERT; John A. Johnson of COMSAT GENERAL; and John L. McLucas, Richard S. Bodman and John V. Harrington of COMSAT. Dr. McLucas is serving as Chairman of the ERT Board.

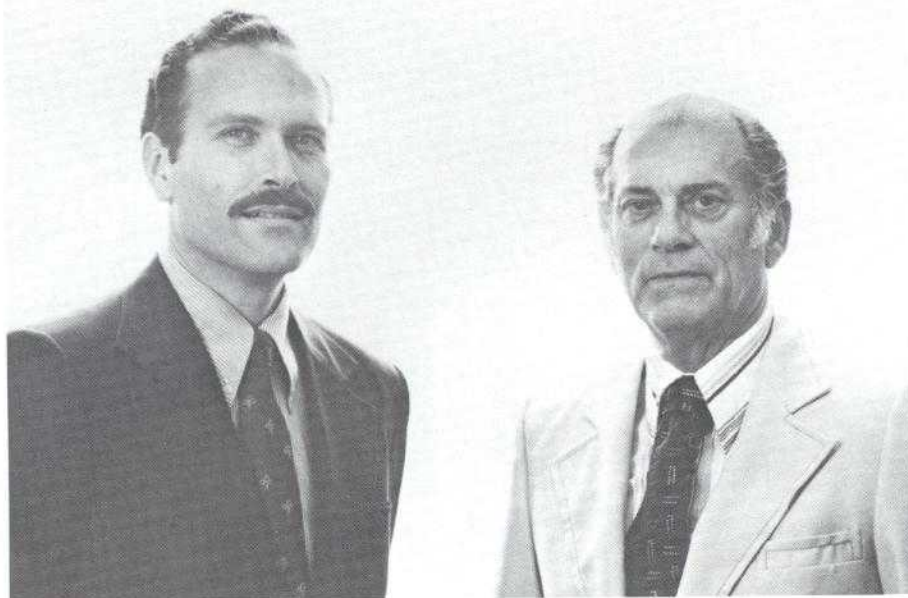
ENVIRONMENTAL RESEARCH & Technology, Inc. (ERT), was started in Stamford, Connecticut, in 1968 by Dr. Norman Gaut and Dr. James Mahoney, two meteorologists who had recently completed graduate study at the Massachusetts Institute of Technology, and Mr. Marvin Gaut, Norman's father.

Finding useful methods for describing air quality had become urgent. The public had been clamoring for ever stricter controls on air emissions, and both government agencies and corporations needed the best possible information to determine the respective actions they must take.

It was the contention of Drs. Gaut and Mahoney that the provision of air quality information should rely first and foremost on meteorology—that is, the science of weather patterns—rather than air chemistry. At the time, air quality was almost always approached from the standpoint of air chemistry. However, the two men argued that distribution of pollutants in the air was highly dependent on weather information and could be predicted by diffusion models as applied to weather patterns.

The ERT record of continued growth in revenue, employees and facilities is testimony that in fact that initial premise was a correct one, and at the same time it is a tribute to the importance of strong management skills in translating innovative science and technology into business success. It was Drs. Gaut and Mahoney who gave ERT its strengths in meteorology, and Mr. Marvin Gaut provided the management strength.

Prior to the start of ERT, Marvin Gaut had been General Manager of the Defense and Industrial Division of Otis Elevator Company. Both Norman Gaut and James Mahoney had been teaching, Gaut at the Massachusetts Institute of Technology and Mahoney at Harvard University's School of Public Health.



*Dr. Norman E. Gaut and Marvin Gaut
Two of ERT's founders*

In late 1969, the company moved to a facility on Guinan Street in Waltham, Massachusetts, a city near Boston. While in Stamford and during its initial months in Waltham, ERT confined its activities to consulting work—that is, to the provision of studies and recommendations to individual clients concerning specific pollution problems. However, management soon made the decision that the establishment of environmental monitoring networks would be of great benefit to ERT's consulting work and would also make it possible for the company to go into the business of selling technical services.

This ability to offer technical services has set ERT apart from most consulting organizations. Today, consulting work continues to constitute a majority of ERT's income, but the sale of monitoring services is not far behind with 44 percent of income in 1978.

The first monitoring system to be created by ERT was AIRMAP, an acronym for Air Monitoring, Analysis and Prediction. AIRMAP enables companies to document their compliance with government-enforced air quality standards. Sensors operating on-site collect data on pollutant concentra-

tions and meteorological conditions. The data is transmitted over telephone lines to a central computer which in turn reports existing pollution levels and, in addition, can use the data to predict air quality changes.

AIRMAP subscribers may receive the pollution level and air quality prediction reports continuously so that they have sufficient time to take corrective action when necessary. In addition to AIRMAP, ERT also offers two other monitoring network programs, one called WATERMAP, for Water Monitoring Analysis and Prediction, the other RADMAP, for Radiation Monitoring Analysis and Prediction. Weather forecasting services, another ERT offering, also involve extensive monitoring and data gathering.

By 1971—the AIRMAP network fully operational and employment roles up to 35—ERT moved its headquarters to a new and larger facility on Marrett Road in Lexington, Massachusetts. The following year, the AIRMAP network was expanded into

Mr. Saft is Editor, External Publications, Office of Public Information.

the midwest by providing monitoring and analysis services to major fuel users in the region. Until then clients and customers had been concentrated on or near the East Coast. Regional air pollution control programs were developed for both government and private planning agencies and groups, and the company entered such new markets as environmental impact assessment, noise abatement, water technology, geophysical studies and scientific instrumentation.

The next year, 1973, began a period of exceptional growth for ERT. The staff alone increased by more than 200 percent that year, reaching a total of 210. A facility was built on Militia Road in Lexington, which became corporate headquarters for awhile. The company's technical operations were consolidated into two major divisions, Environmental Services and Environmental Studies, and a midwest data gathering center for AIRMAP, the Midwestern Technical Center, was established just outside of Chicago.

Although the U.S. economy turned down in 1974, business for ERT continued on its upward curve. The number of employees reached 400. The

Computers are used for handling monitoring data and running computer simulation models.



MAY-JUNE 1979

Western Technical Center was opened just outside of Los Angeles, California, and another facility had to be added in the Boston area to accommodate the growth in demand for services and the concomitant need for additional administrative support—in this case, the present headquarters building at 696 Virginia Road in Concord.

The years 1975 and 1976 were the culmination of this period of outstanding growth. Regional sales offices were opened in Denver, Colorado; Atlanta, Georgia; Rio Piedras, Puerto Rico; Houston, Texas; and Washington, D.C. ERT International, Inc., was formed in order to meet the needs of new clients outside of the United States, and the company began a series of acquisitions including NERA, Inc., and Process Research, Inc., both having considerable water-quality knowhow, and Ecology Consultants, Inc., of Fort Collins, Colorado. The addition of Ecology Consultants provided the company a base around which to expand its effort in the Rocky Mountain area.

Today, Environmental Research & Technology, Inc., consists of a total of 775 employees in 15 locations in 10 states of the United States and in Puerto Rico. More than 150 envi-

ronment-measuring shelters housing more than 850 individual gas-sampling and meteorological instruments are owned by the company, and in addition ERT operates approximately 120 shelters housing about 700 measuring instruments owned by clients. Of the 775 employees, 60 have doctoral degrees and 123 have masters' degrees relating to various disciplines utilized in ERT's business.

Last year, the company had an income of more than \$28 million and gross profits of almost \$9 million.

The company's consulting activities and its air, water, weather and radiation monitoring and forecasting programs have already been noted, but to complete the picture it must be stated that there is no matter having to do with the environment—in all that is now meant by that much-used word—that ERT lacks the ability to measure and study. Corporations, agencies and institutions required by law to write Environmental Impact Statements may turn to ERT for help with every aspect of the task, including testimony in public hearings and litigations.

ERT develops, sells and services scientific instruments for use in environmental monitoring. Its scientists have developed new techniques for analyzing environmental data gathered from aerial and satellite surveys for such applications as water-resource management, site-planning for new plant facilities, highways and transmission lines, and mapping of sea ice as an element in a marine warning system.

The company has the capability of doing extensive acoustic research. Its transportation specialists are skilled in the analysis of traffic volume, flow and vehicle distribution and on evaluating alternative transportation strategies on air and water quality and noise levels. And the company's social scientists are expert in examining community reaction to a proposed project and assessing its impact on social and cultural institutions, while its economists and fi-

(Continued on next page)



Radio weather forecasts, ship routing forecasts and weather forecasts for predicting air quality are prepared in the Global Forecast Center.

During the development of ERT's complete environmental consulting services, air quality monitoring has remained a mainstay of ERT business, providing over 40 percent of sales in 1978.

financial planners have the ability to assess the overall economic impact of a project on a community or region.

Customers and clients include more than 40 electric utility companies such as Boston Edison, New England Electric, Commonwealth Edison of Chicago and the Columbus and Southern Ohio Electric Company. For American Electric Power Company, ERT has been monitoring the stack emissions of 12 coal-burning electricity-generating plants. AIRMAP is the system at use in behalf of these 12 facilities. AIRMAP is also being used to serve 18 other power generating companies, 16 industrial facilities, three petrochemical facilities, five paper manufacturing plants and several other customers.

ERT's executive offices and Eastern Technical Center in Concord, which the company owns, consists of two office buildings and a parking area situated on approximately 40 acres of land. One building contains two floors totaling approximately 62,000 sq. ft. of office and laboratory space, and the other building, which

consists of one floor, contains 40,300 sq. ft. of office space and includes a library and cafeteria.

In addition to serving as ERT's executive offices, these facilities, together with approximately 18,000 sq. ft. of leased space in Lexington, are the headquarters for ERT's environmental monitoring and consulting activities.

The other major facilities are:

- **Midwestern Technical Center**, 12,000 sq. ft. of office and laboratory space in Lombard, Illinois (just outside of Chicago);
- **Life Sciences Center**, located at the offices of Ecology Consultants, Inc., a wholly-owned subsidiary of ERT, and consisting of about 21,000 sq. ft. of office, laboratory and storage space in Fort Collins, Colorado;
- **Western Technical Center**, 12,700 sq. ft. of office and laboratory space in Westlake Village, California (just outside of Los Angeles);

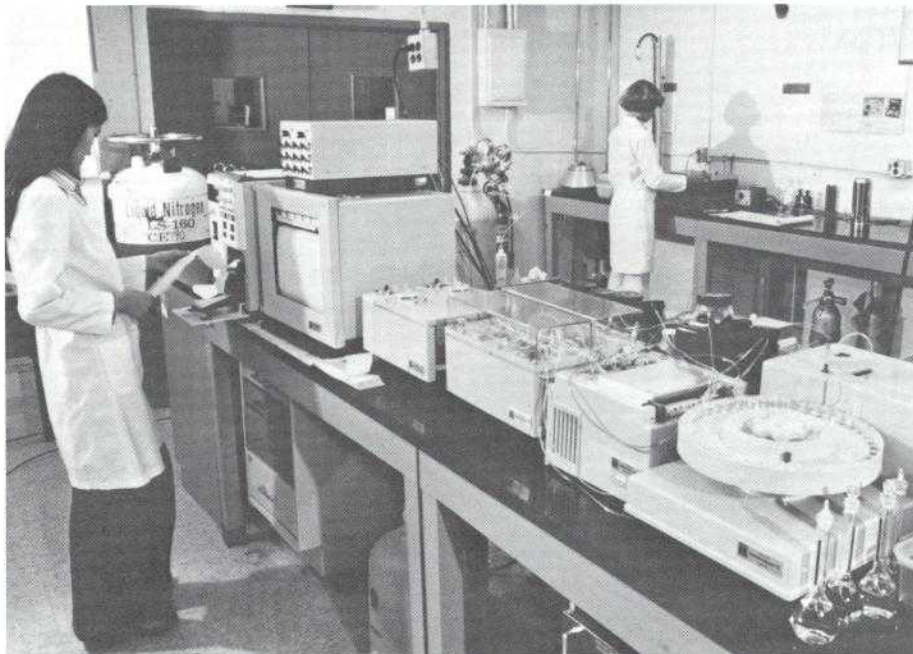
A sizeable staff of aquatic and terrestrial ecologists performs field and laboratory work and consulting on regulations to clients. Soil scientists, hydrologists and geologists are also important staff in the Colorado office.



PATHWAYS



ERT is a world leader in air quality modeling and consulting. ERT is continually developing new models and keeping on the leading edge of modeling technology in order to help clients meet the ever-growing body of air quality regulations.



Chemical analyses of air and water samples are processed in ERT laboratories in Concord, Massachusetts, and Westlake Village, California. ERT chemists are also involved with state-of-the-art research in aerosol chemistry.

ERT PHOTOS

In Concord and Lombard, Illinois, ERT operates the most extensive commercial air quality monitoring instrument calibration laboratories in the United States.



• An environmental engineering activities office, occupying 2,700 sq. ft. in Pittsburgh, Pennsylvania.

In addition, regional marketing offices are maintained in Atlanta, Houston, Billings, Montana; Parsippany, New Jersey; and San Juan, Puerto Rico; and district operational offices are in Wilkes Barre, Pennsylvania; Parkersburg, West Virginia; and Jeffersonville, Indiana.

The one segment of ERT that is not joining COMSAT is ERT International, Inc. The latter has a 36.5 percent interest in Amartech, a company established in Saudi Arabia to provide pollution monitoring services in the Middle East. Mr. Marvin Gaut has elected to stay with ERT International, which will become an independent entity, and thus Mr. Gaut has dissociated himself from the parent company.

All other employees of ERT continue as a part of ERT, performing the same services as they have been doing all along, but, in addition, they now can say, "I'm a part of COMSAT." Welcome aboard.

In conjunction with its instrument calibration laboratories, ERT offers full service instrument repair and overhaul.



U.S. Court grants SBS petition for rehearing

The U.S. Court of Appeals in Washington has granted the SBS and FCC petitions for a rehearing of the decision reached by a three-judge panel last August 29.

The Court agreed to a rehearing by the full nine-member court, and ordered that the case be scheduled for oral argument during the September 1979 term. In so doing, the court vacated the earlier decision of the three-judge panel.

Philip N. Whittaker, SBS President, said, "We are naturally very pleased that the full Court of Appeals has agreed with us that the August 29 decision should be reconsidered."

The August 29 decision had reversed the FCC Order authorizing SBS to establish its Operational System and remanded the Order to the FCC for an evidentiary hearing on the question of whether SBS's ownership structure might have anticompetitive effect in the marketplace.

The SBS Order, which was issued on February 8, 1977, was appealed by the Department of Justice, AT&T, American Satellite Corporation and Western Union. The key issues on appeal were whether the FCC used the correct standard in balancing anticompetitive concerns against the public interest benefits of the SBS system, and whether the FCC should have held a trial-type hearing on the antitrust issues at the time it considered SBS's system applications. Those remain issues for the full court to rule on.

Officers elected to head new subsidiary

Four operating officers have been elected to COMSAT GENERAL TeleSystems, Inc., a new COMSAT GENERAL subsidiary formed to manufacture high technology products and systems for the telecommunications market.

Lewis S. Norman is Executive Vice President and General Manager. The other officers are Robert J. Shea, Vice President, Marketing; A. William Perigard, Vice President, Manufacturing Operations; and Marvin L. Sassler, Vice President, Engineering.

COMSAT President and Chief Executive Officer Joseph V. Charyk told shareholders at COMSAT's recent annual meeting: "Even at this early stage we are encouraged by indications that there may be a sizable market for COMSAT GENERAL TeleSystems products."

The new company will have temporary headquarters at Beltway Business Center, 6464 General Green Way, Alexandria, Va. 22312 (off Edsall Rd. and Rt. 395, about 20 miles south of Washington, D.C.), telephone 703/256-0700, telex 89-2668. Permanent headquarters are being constructed in Merrifield, Va.

Congressman Visits Lab

Congressman Michael W. Barnes of Montgomery County's Eighth District (right) and his aide Bill Murphy (left) recently visited the Labs and were shown through the facilities by William Fallon, Director, COMSAT Labs Research and Development Support Services (center). Earlier, the guests had been briefed by Labs Executive Director Louis Pollack.



AIAA members tour Labs

More than 150 members and guests of Washington based organizations of the scientific community received briefings and were conducted on a tour of facilities during a recent visit to COMSAT Labs.

The guests were representatives of the National Capitol Section of the American Institute of Aeronautics and Astronautics (AIAA), the Washington Section of the Institute of Electrical and Electronic Engineers (IEEE), the Washington Society of Engineers and the Washington Academy of Sciences.

New regional satellite systems found compatible with INTELSAT

Government representatives from INTELSAT's member-countries have concluded that two new regional satellite systems planned by some INTELSAT members are technically compatible with the present INTELSAT system and pose no significant threat to its economic well-being.

The two systems discussed at a recent special meeting of INTELSAT's Assembly of Parties in Manila, The Philippines, were the proposed European Communications Satellite (ECS) system and the Indonesia Palapa B system.

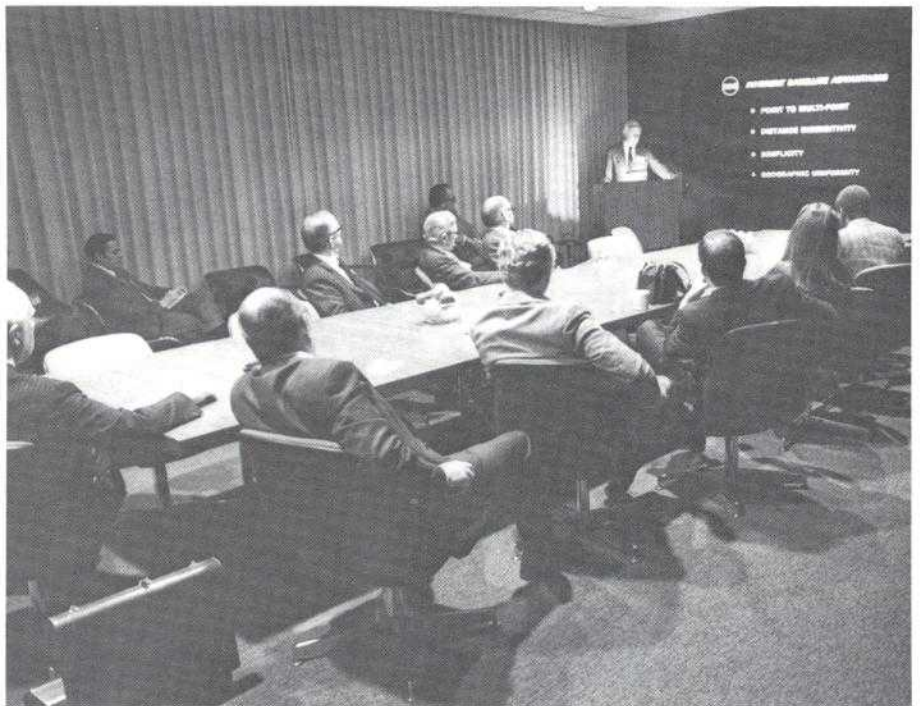
The ECS system is intended to provide international telecommunications services to countries in East and Western Europe and North Africa beginning in 1982 in conjunction with Europe's highly-developed terrestrial network.

The Palapa B system is a cooperative venture of Asian countries, including Indonesia, Malaysia, the Philippines, Singapore and Thailand, designed to provide telecommunications services to remote areas not having access to the INTELSAT system, also beginning in 1982.

Fifield returns to Andover as manager

Donald Fifield, formerly Assistant Station Manager at Etam, West Virginia, Station Manager at Andover, Maine, and more recently with U.S. Communications Systems here at the Plaza, has returned to Andover as Station Manager.

James R. Warren, Andover Manager since January 1977, and formerly Assistant Station Manager at Brewster, Washington, and Manager of the M&S Center at Clarksburg, Maryland, has been assigned to COMSAT Headquarters as a Senior Project Manager in the new Project Management Office of International Communications.



Members of the COMSAT Board of Directors are briefed on the activities of Satellite Business Systems. During the day-long briefing the Directors viewed and participated in a communications demonstration of the innovative services offered SBS customers in its all-digital satellite system.

COMSAT Directors get SBS briefing

COMSAT Directors Bruce G. Sundlun, Joan F. Tobin, Jesse Hill, Jr., and Howard J. Morgens (left to right) are briefed by IBM's R. F. Henderson on the transmission of inter-office mail from one location to another utilizing the SBS domestic satellite system.





NOTES FROM PERSONNEL

BY HOLLY PRYATEL

Job classifications originate with Fair Labor Standards Act

The words "exempt and non-exempt" are used often at COMSAT, but I often wonder if people really understand the basis for and the application of these employee classifications. The general understanding is that exempt employees can take time off and not show it on their time sheet, while non-exempts have to show all time not worked. Or, exempts are professional employees and non-exempts are not.

Actually, "professionalism" is a state of mind, not a state of being. Anyone can be a professional in his or her job. The real meaning of exempt and non-exempt comes from the Fair Labor Standards Act of 1938. The FLSA as amended establishes minimum wage, overtime pay, equal pay, recordkeeping, and child labor standards affecting more than 50 million full-time and part-time workers. To explain all these provisions would take more space than I have here—plus a lawyer. But, I'd like to concisely explain where the words exempt and non-exempt come from.

These classifications apply to the minimum wage and overtime pay provisions of the Act. There are four categories of jobs that are not protected by the law; that is, they are "exempt" from the FLSA overtime provision. These categories are called Executives, Administrative employees, Professionals, and Outside Salesmen. A person whose job does not fall into these categories is protected by the law and as a result must be paid for overtime hours worked. In other words, the person is "not exempt" from the law—hence the term "non-exempt."

Because it is to an employee's advantage to be covered by the Act, the burden of proving an exemption lies with the employer. Thus, the decision to classify a job as exempt from the law is not an arbitrary one. The employer—usually the Personnel Department and sometimes the Legal Department—must apply certain tests to determine if a job is exempt. These tests are complicated and extensive, but will be very briefly outlined below. Remember that this discussion is limited to people working in a company such as COMSAT.

All of the requirements for each of the four categories must be met before a job is classified as exempt. There are three requirements that are common to the executives, administrative employees, and the professionals:

(Continued on page 20)

Family deductible change in medical plan

As we reported earlier, the family deductible under our medical plan with Lincoln National Life Insurance Company is now \$200 per family each year. This is effective as of April 1, 1979.

Previously, two family members each had to meet a \$100 deductible. Now, all covered expenses for each family member will apply toward a \$200 deductible.

Lincoln National will apply medical bills submitted before April 1 towards the deductible if a claim is submitted for expenses after that date.

Charges incurred prior to April 1 will not be recomputed without a later claim form, and no additional medical expense reimbursements will be made for charges that occurred prior to that date.

Enrollment in medical and dental plans

Speaking of families, when you're hired, you are offered the option of enrolling your dependents in both the medical and the dental plans. Coverage for dependents for medical insurance under Lincoln National is \$7 per pay period, and \$2 per pay period for dental insurance.

If you choose single coverage on your date of hire, but later get married or have a child, you may want to change to family coverage. If so, you need to notify Personnel within 31 days of the marriage or birth. If you fail to do this within 31 days, you will have to provide evidence of insurability to cover the dependent under the medical plan. Of course, if you and your dependents were enrolled in the HMO and decide to switch to Lincoln National's medical plan during open enrollment, your dependents will automatically be covered by Lincoln without providing evidence of insurability. The dental plan does not provide for late enrollment of dependents unless an open enrollment period is offered, which is not likely in the near future.

Eligible dependents under both the medical and dental plans include your spouse, unmarried dependent children of any age who are not capable of self-support because of mental retardation or a physical handicap that occurred before they reached age 26, and your unmarried dependent children from birth to 26, unless employed on a full-time basis at ages 19 to 26. "Children" means stepchildren, foster children, legally adopted children, and any other children who are living with you and who depend on you for support and maintenance as provided under a court order.

GRADUATES

PATHWAYS is pleased to present the 1979 graduates, the sons and daughters of the employees of COMSAT, COMSAT General and INTELSAT.

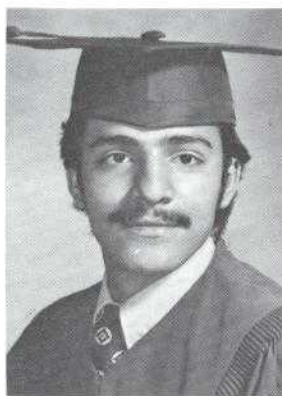
Class of '79



Nicholas John Ackerman, son of Mr. and Mrs. Eric Ackerman (Clarksburg), B.Sc., Animal Sciences, Maryland University.



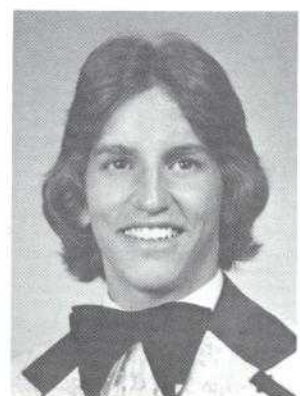
Jeffrey Blaine Allison, son of James F. and Elaine Allison (Labs), Frederick H.S., Frederick, Md.



Willie Arevalo, son of Lidia C. Oliva (Headquarters), Montgomery Blair H.S., Silver Spring, Md.



Peter John Bergamini, son of Anthony A. and Elsie Bergamini (Headquarters), B.S., E.E., U.S. Air Force Academy.



Timothy Scott Bland, son of Mr. and Mrs. Floyd F. Bland (Labs), Loch Raven Sr. High School, Towson, Md.



Debra Briggs, daughter of Mr. and Mrs. Alden Briggs (Andover), Telstar Regional H.S., Bethel, Me.



Sharon Briggs, daughter of Mr. and Mrs. Alden Briggs (Andover), Assoc. Degree, Early Childhood Training, University of Maine.



Teresa A. (Terri) Burks, daughter of Mr. and Mrs. David E. Burks (Intelsat), Lake Braddock Secondary School, Burke, Va.



James R. Chow, son of Mr. and Mrs. Joe M. Chow (Paumalu), Leilehua H.S., Wahiawa, Hawaii.



Traci Barbara Conkling, daughter of Peggy Conkling (Headquarters), Springbrook H.S.



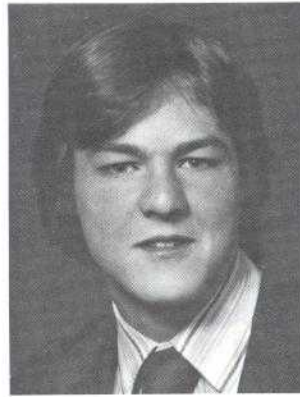
Eileen P. Cooke, daughter of Mr. and Mrs. Paul F. Cooke (Headquarters), Bishop O. J. O'Connell H. S., Arlington, Va.



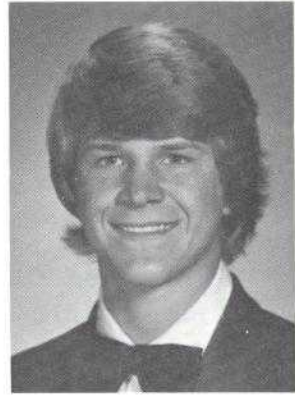
John A. Dorian, son of Mr. and Mrs. C. Dorian (Comsat General), Maret School, Washington, D.C.



Steven J. Fagan, son of John Fagan (Headquarters), Satellite H. S., Satellite Beach, Fla.



William I. Fallon III, son of Mr. and Mrs. William I. Fallon, Jr. (Labs), Gonzaga College H. S., Washington, D.C.



Randall Forrester, son of Dan and Nancy Forrester (Labs), High Point H. S., Beltsville, Md.



Linda L. Gifford, daughter of Mr. and Mrs. Leonard W. Gifford (Etam), B.A., Business Administration, West Virginia University, Morgantown, W. Va.



Tom Ginsberg, son of Marvin and Bernadine Ginsberg (Labs), Milford Mill H. S., Baltimore, Md.



Barbara M. Groshans, daughter of Russell and Barbara Groshans (Comsat General), Langley H. S., Langley, Va.



Maris Groshans, daughter of Russell and Barbara Groshans (Comsat General), B.A., Georgetown University, Washington, D.C.



David Haseltine, son of Arthur Haseltine (Andover), Mexico H. S., Mexico, Me.



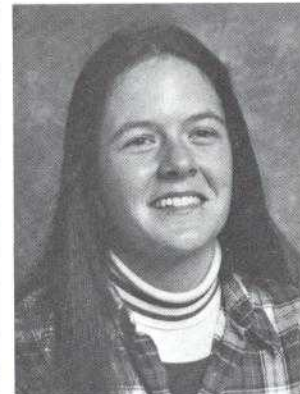
Dagmar Anna Horna, daughter of Dr. and Mrs. Otakar A. Horna (Labs), A.A. in Business Administration, Montgomery College.



Gregory G. Huson, son of Mr. and Mrs. George Huson (Labs), B.S.E., Princeton University.



Philip Ralph Hyde, son of Dr. and Mrs. Geoffrey Hyde (Labs), J. D., Villanova University Law School.



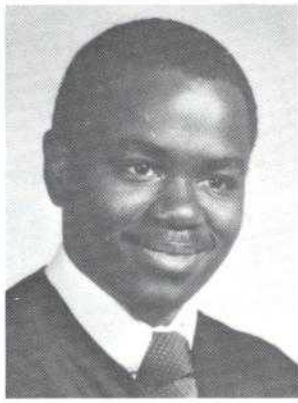
Mary Catherine Kilcoyne, daughter of Mr. and Mrs. James H. Kilcoyne, Jr. (Comsat General), B.S., Special Education, James Madison University, Harrisonburg, Va.



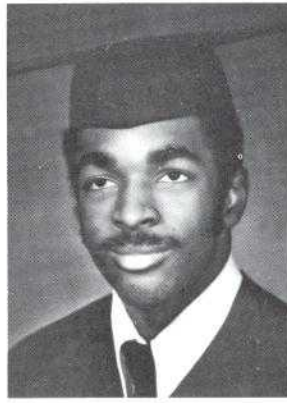
Dean S. Kumasaka, son of Mr. and Mrs. Robert N. Kumasaka (Paumalu), Waialua H. S., Waialua, Hawaii.



Larry Langley, son of Louise Langley (Headquarters), Northwood H. S., Silver Spring, Md.



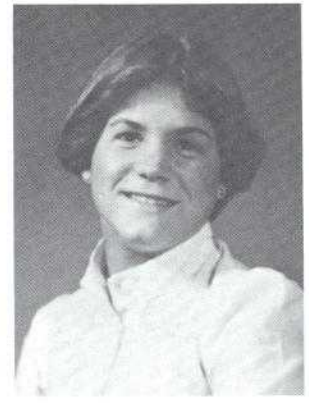
Christopher Jerome Lawrence, son of Mr. and Mrs. John C. Lawrence, Sr. (Headquarters), Roosevelt H. S.



Kenneth A. Lee, son of Mr. and Mrs. S. H. Lee (Headquarters), Potomac H. S., Oxon Hill, Md.



Kathy Diane Leiter, daughter of Mr. and Mrs. Joachim Kaiser (Labs), B.S., Gymnastic Movements, American University.



Lynn M. Lepage, daughter of Mr. and Mrs. Charles Lepage (Andover), Rumford H. S., Rumford, Me.



Corrine M. McCusker, daughter of Mr. and Mrs. J. Pat McCusker (Labs), Frederick H. S., Frederick, Md.



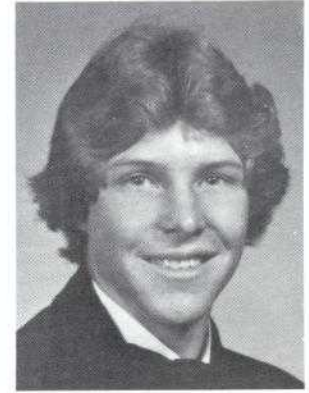
Janette P. McCusker, daughter of Mr. and Mrs. J. Pat McCusker (Labs), B.S., Business Administration, Frostburg State College, Frostburg, Md.



Christine West Norman, daughter of Mr. and Mrs. Lewis S. Norman, Jr. (Telesystems), Oakton H. S., Fairfax, Va.



Diana Orantes Ceresi, daughter of Mr. and Mrs. Cesar A. Orantes (Intelsat), J. D., George Washington University.



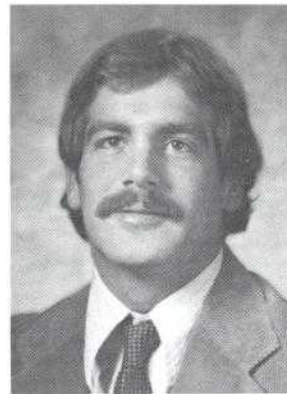
John Scot Oslund, son of Mr. and Mrs. Jack Oslund (Headquarters), Lake Braddock H. S., Springfield, Va.



James G. Owens, son of Mr. and Mrs. James R. Owens (Intelsat), Good Council H. S., Wheaton, Md.



Gregory R. Parsons, son of Mr. and Mrs. Roger E. Parsons (Headquarters), Southern H. S., Oakland, Md.



Michael J. Peterson, son of Mr. and Mrs. John J. Peterson (Headquarters), B.A., Law Enforcement, U. of Maryland.



Barry C. Reid, son of Mr. and Mrs. Robert P. (Blanche) Reid (Labs), Damascus H. S., Damascus, Md.



Mary Helen Rivera, daughter of Mr. and Mrs. D. M. Rivera (Labs), Oakland Mills H. S., Columbia, Md.



Rachel Jill Roseman, daughter of Mr. and Mrs. Leonard Roseman (Headquarters), Lenape Valley Regional H. S., Stanhope, N. J.



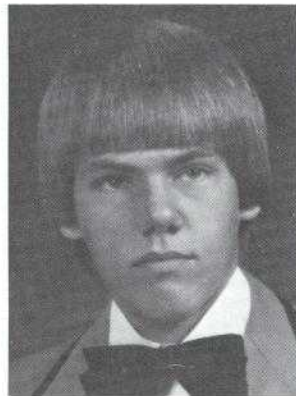
Donna L. St.Clair, daughter of Mr. and Mrs. Samuel T. St.Clair (Etam), West Preston H.S., Masontown, W. Va.



Donna L. Sederquist, daughter of Carl A. and Donna F. Sederquist (Headquarters), A.A., Radiologic Sciences, Prince Georges Community College.



Mary Lou Shea, daughter of Gloria and Patrick Shea (Comsat General), George C. Marshall H. S., Falls Church, Va.



Claggett L. Thompson, son of Mr. and Mrs. Jesse L. Thompson (Labs), Brunswick H. S., Brunswick, Md.



Steven G. Wabnitz, son of Mr. and Mrs. Edwin Wabnitz (Headquarters), B.S., Biology, University of Maryland.



Linda Ann Weber, daughter of Frederick and Nancy E. Weber (Headquarters), T. C. Williams H. S., Alexandria, Va.

Etam graduates for whom photos were not available are:

Karen L. Adams, daughter of Mr. and Mrs. William H. Adams, Fairmont St. College, Fairmont, W. Va., degree in Bus. Adm.

Deborah J. Formella, W. Preston H.S., Masontown, W. Va.

Laura A. Formella, W. Va. University, degree in Nursing. The Misses Formella are daughters of Mr. and Mrs. John R. Formella.

(Continued from page 16)

- The work requires the consistent exercise of discretion and independent judgment.

- Not more than 20 percent of hours worked in the workweek may be spent on activities which are not directly and closely related to the performance of the job's duties.

- Each category has a certain salary requirement, which is at least \$155 per week.

In addition to these requirements, each category has special provisions, all of which must be satisfied:

Executives

- Primary duty consists of the management of (a) the enterprise in which he/she is employed, or (b) a

recognized department or subdivision of the enterprise.

- Customarily and regularly directs the work of two or more other employees.

- Has authority to hire or fire other employees, or to make recommendations as to hiring, firing, promotion, or other changes in status of employees.

Administrative employees

- Primary duty consists of the performance of office or nonmanual field work directly related to management policies or general business operations of his employer or his employer's customers.

- Regularly and directly assists an employee employed in a bona fide executive or administrative capacity; or performs, under only general supervision, work along specialized or technical lines requiring special training, experience, or knowledge; or executes, under only general supervision, special assignments and tasks.

Professional employees

- Primary duty consists of either (a) work requiring knowledge of advanced type in a field of science or learning, or (b) original and creative work in an artistic field.

- Work must be (a) predominantly intellectual and varied in character as opposed to routine mental, manual, mechanical or physical work, and (b) of such a character that the output produced or the result accomplished cannot be standardized in relation to a given period of time.

Outside salesmen

- Customarily and regularly engaged away from the employer's place of business in (a) making sales, or (b) obtaining orders or contracts for services or use of facilities.

- Hours of work of a nature other than described in the first test must not exceed 20 percent of the hours worked in the workweek by non-exempt employees.

Again, all the tests must be met for a job to be classified in one of the exempt categories. So, exempt and non-exempt mean more than how a person fills out a time sheet.



ICA Exhibit

Lloyd R. Issacs (left) of the Chrysler Corporation and First Vice President of the International Communications Association, ICA, is briefed by COMSAT's David E. Gourley, Director of Sales, at the ICA Annual Exposition in Hollywood, Florida. COMSAT's Robert Ames and Hostess Jill Cohen (right) assisted COMSAT exhibit viewers.



Scholarship Award

Donald A. Tree (second from right) is presented with the 1979 COMSAT Scholarship Award by COMSAT President and Chief Executive Officer Joseph V. Charyk. Attending the award ceremony are the award winner's parents Mr. and Mrs. Bernard A. Tree (left and right). Mr. Tree is a Labs employee. Donald plans to attend the University of Maryland.



Labs Research Award

Paul L. Fleming, Manager, Device Physics, Applied Sciences Lab (center), is the recipient of the 1979 Labs Research Award. Presenting Fleming with the award are Laboratories Executive Director Louis Pollack (left) and Senior Scientist Pier L. Bargellini. (Story below).



Basketball Trophy

Labs Executive Director Louis Pollack (left) accepts a trophy on behalf of Labs employees from Pete Carlton representing the Upper Montgomery Athletic Club, UMAC. The trophy was awarded the Labs in recognition of its sponsorship of the Junior Division team which won the championship of the UMAC Basketball League. Carlton is a member of the Microwave Lab.

Fleming presented with 1979 Labs Research Award

Paul L. Fleming, Manager, Device Physics, Applied Sciences Laboratory, has been selected as the recipient of the 1979 Labs Research Award.

The award is given, usually each year, for exceptional accomplishment of significant engineering merit in research and development work at the Labs.

Fleming was selected in recognition of his significant contributions

in the research and development of solid-state devices at COMSAT Labs and, in particular, to the invention of the Active Medium Propagation (AMP) concept and development of an operating device.

The selection committee for the 1979 award consisted of Burton I. Edelson, former Labs Director; Louis Pollack, Labs Executive Director; and Pier L. Bargellini, Senior Scientist. Previous winners of the

Labs Research Award have been: 1976, O. K. Horna, in recognition of outstanding contributions to the development of a digital logarithmic echo canceller; 1977, R. W. Gruner, for his outstanding contributions to the design of antenna components with exceptional performance; and three co-winners in 1978, J. D. Dunlop, J. F. Stockel and G. Van Ommering, in recognition of the invention and engineering development of the Nickel-Hydrogen battery.

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

Terri Myers

Southbury

Eileen Jacobsen

ANDOVER. The CEAA held a combination "Spring Coming Out Party" and a "Farewell Party" for **Jim and Liz Warren** at the Silvertone Restaurant in Rumford. Gifts were presented to the departing Warrens and we wish Jim well in his new job at Plaza Headquarters.

With Jim's departure we welcome back **Don Fifield** as our old/new Station Manager. A welcome back gathering was held for Don at Rumford's Madison Restaurant.

Another farewell party was held at the Silvertone for departing Senior Technician **Hal Frazier** and wife **Joyce**. Hal accepted a position with INTELSAT.

Knowing full well that our report on the arrival of Spring will be late we would still like to note that we had a beautiful Spring with the temperature reaching 91 degrees on May 9, almost matching the 1944 record of 92 degrees at the Portland Jetport. It was welcome after a rough winter.

Our plush lawn serves as the dining table regularly for our visiting moose. It goes without saying that he comes and goes as he pleases and commuting station personnel proceed with caution when the moose is in sight.



Our visiting moose

Our station is taking on a new look. The Visitors' Building has had a face lift (new paint job) and a new station sign erected at the entrance



Visitors' Building face lift

New station sign



to take the place of the old one which was completely demolished during a severe winter storm.—**Joanne Witas**

CAYEY: A footnote

Editor's note. A story on the transfer of the Cayey Earth Station from COMSAT operations was carried in the last issue of *PATHWAYS*. What follows is a reprint of the letter sent Station Manager Luis R. Rodriguez by COMSAT President Joseph V. Charyk, accompanied by photos taken on the station's last day with COMSAT.

Dear Mr. Rodriguez:

It is with sincere regret that I have to bid you farewell as the Puerto Rico traffic is transferred from the international service to the domestic system. You have been with COMSAT for 11 years and have contributed outstandingly to the reliability of our earth stations and to the financial position of the Corporation and our ESOC partners.

Cayey has been in continuous service since January 1969, over 10 years now. The reliability of the Cayey station over these past 10 years has exceeded our performance objective of 99.99 percent. This performance reflects your skills and the skills of your fellow employees. It is also an indication of conscientious effort by all of the members of the Cayey staff.

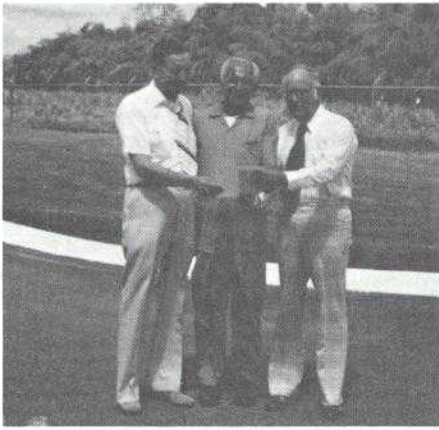
I want to thank you for the contribution you have made to international communications service in general, and specifically for your contribution to COMSAT and ESOC.

We are continuing our study of how best to accommodate international telecommunications traffic originating and terminating in Puerto Rico, and it is my hope that at some time in the not too distant future there might be established an international communications earth station in Puerto Rico.

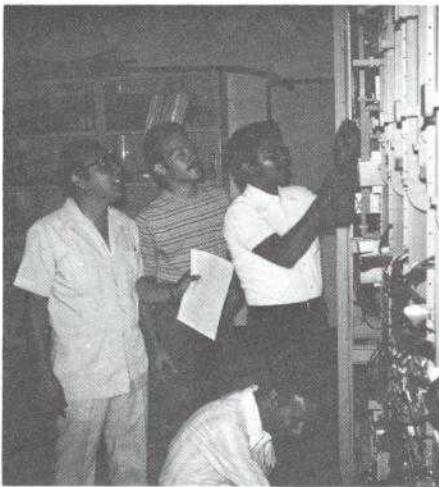
I trust that your career with AAC&R will be challenging and rewarding and wish you all the success and best personal regards.

Joseph V. Charyk

(Accompanying photos in first column of next page.)



Station Manager Rodriguez (right) and station member Emilio Rodriguez (center) show letter of appreciation received from Dr. Charyk to William B. Carroll, Assistant General Manager, International Communications.



Cayey technical personnel adjust RF equipment. Shown from left to right (standing) are E. V. Castro, Operations Supervisor, Junior Technician Luis Ruiz and Technician A. Olivares with Senior Technician J. Sierra at bottom of photo.



Material Control Specialist L. Medina and Ada Gonzalez, Secretary and Finance Clerk, handling administrative duties.

ETAM. The ECEA recently sponsored a social party at the home of **Don Gaston** and a spaghetti luncheon in the station canteen. **Paul Helfgott** resigned as representative of the ECEA with **John Haller** elected to succeed him. Both **Bill Miller** and **Paul Helfgott** have made trips to Plaza Headquarters during the past few months.

Navy Seaman **Samuel T. St. Clair, Jr.**, son of **Samuel T.** and **Linda St. Clair**, recently completed recruit training at the Naval Training Center at Great Lakes, Illinois. **Samuel, Sr.**, is Etam's Facilities Maintenance Supervisor.

Bill and **Bev Miller** recently vacationed in Connecticut. **Mike O'Hara's** wife **Elfriede** spent six weeks in her native Bavaria, Germany. **Don** and **Gerry Gaston's** daughter **Donna** will be returning from Germany with her new son for a vacation. Both **Donna** and her husband **Todd Decker** are in the U.S. Army. This will be the first time the **Gaston's** will have seen their new grandson.

—**Bev Conner**

JAMESBURG. Short of news this issue but would like to welcome **John Hammond** on board as a Junior Technician. **John** is single and hails from **Pacific Grove** on the coast. He is a graduate of **Monterey Peninsula College** with an A.S. degree in Electronics. **John** is assigned to **Team B**.

—**C. B. Marshall**

LABS. Award recipients since the last issue of **PATHWAYS** include **Bill Windell**, ten-year service; **Pam Wood**, five-year service; and **Francois Assal**, **Ali Atia**, **Arnold Berman**, **Henry Carlson**, **Bill Childs**, **Jim Dunlop**, **Paul Fleming**, **Howard Fliieger**, **Lin-Nan Lee**, **Drew Meulenberg**, **Dave Perlmutter** and **Paul Schrantz**, patent awards.

Among our new hires are **Gary Barber**, **Michael Chakarji**, **Steve Garber**, **Jim Hawse**, **Shyama (Sally)**

Jha, **Barre Lankford**, **Richard Lehr**, **Harry Reece**, **Mark Seddon**, **Michael Sims**, **Susan Thompson**, **Denise Tober**, **George Walker**, **Barbara Wenschhoff**, **Kenneth Wilkinson** and **Bernard Wills**. Terminating Labs employment were **Ann Garza**, **Karla Johnson**, **David Kennedy**, **Lester Rochester**, **Sheldon Steinerman**, **Brady Warner**, **Marvin Wax**, **Robert Whitely** and **Ronnie Zak**.

Karla Johnson is leaving the Labs to attend a two-year course in photography at the **Rochester Institute of Technology** in **New York**. **Shirley Anders** has moved into a new home. **Wanda McKinley** has rejoined the Personnel Department as Personnel Administrator. **Ronnie Zak** is leaving to accompany her husband who has been transferred to **Okinawa**. It's a new son for **Dr. and Mrs. Akos G. Revesz**. **Renee Alsaffar** is now working for **Digital Communications Corporation** as the Librarian. **Anne Speare** sprained her ankle and will be on crutches for awhile. **Debbie Loy**, our Library co-op is sporting a tan she got in **Daytona** during her spring break. Congratulations to the **Sandy Wilsons** on the birth of daughter **Christy Michelle**. **Frank Lee** received his PhD from **Washington University** and **Martin Earl** received a BS in **Electrical Engineering** from **Catholic University**. **Dan** and **Nancy Forrester** celebrated their twenty-fifth anniversary vacationing in **Los Angeles** and **Hawaii** to include a tour of the **Paumalu Earth Station**. **Paulette Luper** completed her training and is now an **Emergency Medical Technician** in the **Montgomery Village Fire Department**. **Paulette** also ran away with most of the women's prizes during the recent **COMSAT Golf Tournament** with women's low gross, closest to the pin and the longest drive. **Mary Penrose** won the women's low net.

The **CEA Chess Tournament** was held with 15 players participating. The **Swiss System** was used with each player playing four games. **Vladimir Krichevsky** was tournament winner, followed by **Bob Cool**, **Gary**

Gordon and **Drew Meulenberg** in that order. A chess ladder is now in effect. Inquiries can be forwarded to **Blaine Shatzer**, President of the Chess Club.



Dr. Gary Gordon of the Labs studies a possible move during CEA Chess Tournament.

The Labs Softball Team started its 1979 season under new management and with many new faces. **Jerry Creamer** and **Bert Collins** took over the reins this year and the team looks a lot stronger than in past years. Among the new faces are **Paul Cameron**, **John Poklemba**, **John Kisser**, **Jack Wengryniuk**, **Bill Hersey**, **Gary Zimmerman** and **Harry Reese**.

In its first league game COMSAT came from behind to defeat King Pontiac 11-10. The Labs Eleven collected 20 hits with **Harry Haigh**, **Jerry Creamer** and **Gary Zimmerman** getting three hits apiece—pitcher **Bill Burch** was credited with the win. **Hank Mueller** drove in five runs while **Paul Cameron** and **Jerry Creamer** drove in four as the Labs gathered 28 hits to demolish the "Bombers" 26-123 in the second league game of the season. Pitcher **Bert Collins** coasted to his first win of the new season. Strong man **Jerry Creamer** hit two home runs and **Paul Cameron** had a four-bagger in the lopsided contest. —B.P.S.

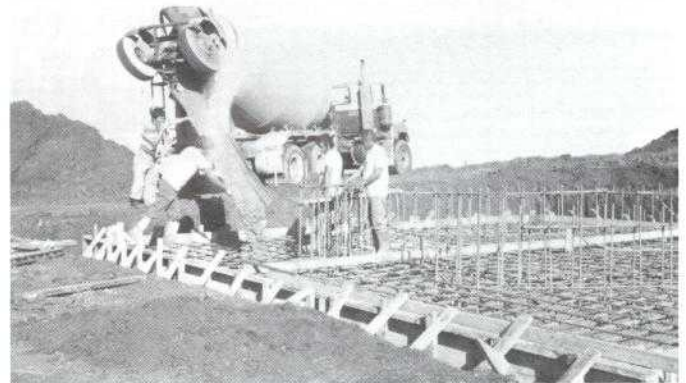
PAUMALU. Construction on work on the new TTC&M antenna is progressing with the completion date of antenna pedestal and building set for early summer. Excavation work was begun in February and concrete poured for the antenna base in early March.

The CEA officers were elected for 1979 and include **Bob Makizuru**, President, **Eddie Miyatake**, Vice President, and **Lily Miram**, Secretary-Treasurer. Planning is underway for the summer family picnic. Senior Technicians **Don Stribling** and **Tom Akimoto** received their

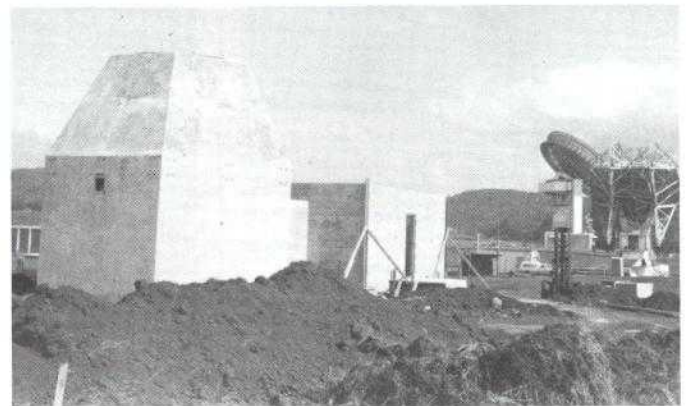
five-year service awards.

Summertime usually means travel time and this year has been no exception so far. **Joe Chow** traveled to Toronto, Canada, qualifying for "most miles on a trip." Joe visited with his parents and joined them in celebrating their Golden Wedding Anniversary. One of the most unusual and exciting trips was that taken by Senior Technician **Kent Hunter**. Kent flew to California, purchased a 25-foot sailboat in San Pedro, then—by himself—sailed his 25-footer 2,400 miles across the Pacific to Hawaii.

—**Bob Kumasaka**



In the top photo, concrete is poured for the new TTC&M antenna base. The antenna base and building are shown in the bottom photo nearing completion approximately 60 days later.



PLAZA. Looks like the military life still appeals to some of this year's graduating sons of Corporate employees. **Peter Bergamini**, son of COMSAT's **Anthony Bergamini**, graduated from the Air Force Academy at Colorado Springs. **John A. Dorian**, son of COMSAT GENERAL'S **Charles Dorian**, has received an appointment to the Air Force Academy and will become a member of the Class of

'83. **Mike Peterson**, son of PATHWAYS Editor **John Peterson**, has been commissioned a second Lieutenant in the Marine Corps and has reported to Quantico. The Petersons' daughter, First Lieutenant **Elizabeth Susan**, is a recent graduate of the Flight Nurse School at Brooks Air Force Base, Texas. **Ed Wabnitz's** son **Steve** was commissioned a second lieutenant through the Army's R.O.T.C.

After a pre-wedding party hosted by co-workers, in the COMSAT Theater, Finance's **Bill Connor** and **Claudette Tremback** were married May 18, and left for a honeymoon in Hawaii.

Sun-seekers from Personnel: **Nancy Dougherty** in Marco Island, Florida; **Holly Pryatel** in Myrtle Beach, South Carolina; and **Bob** and **Pam Dahlgren** (International Communications Division) in Caneel Bay, St. Johns, Virgin Islands.

Service Anniversaries

Celebrating COMSAT anniversary dates in May 1979 were:

10 years

Labs. Melvyn Grossman, Nelson L. Hyman, Betty L. Linthicum, Arthur S. Myers, Akos G. Revesz, Albert E. Williams.

El Segundo. Neil R. Lardy

5 years

Plaza. Delores C. Anderson, Jahel B. Davila, Micheline Fleurant, Lewis S. Norman, Jr., Frank L. Roseboro.

Labs. Robert C. Barber

Paumalu. Donald W. Stribling

Celebrating COMSAT anniversary dates in June 1979 were:

15 years

Plaza. Patricia T. Kiernan

10 years

Plaza. Audrey L. Rudd. Ivor N. Knight.

Labs. Brij N. Agrawal, Khodadad Betaharon, Donald J. Chontos, Kenneth H. Greene, Robert F. Hefele, Joseph Molz, Nathan Morell.

5 years

Plaza. Wayne Bess, Joann L. Morgan, Charles W. Pickett II, Charles M. Spangler, Jr., Daniel F. Thomas, Sherry R. Wells.

Labs. Robert L. Bass, Robert C. Davis, Michael M. Jaeger, Robert A. Pritchard, Michael O. Roberts, Karen L. Updike.

Jamesburg. Mark L. Seaman

Paumalu. Thomas T. Akimoto

SANTA PAULA. Our best wishes go with **Gordon Johnson**, until recently Station Engineer and now Station Manager at the Southbury Earth Station in Connecticut. He will be missed here at Santa Paula. Former Station Maintenance Technician **Charles Kraft** has taken over Gordon's responsibilities as Station Engineer.

Station Manager **Dan Geer** spent a week sunning and sailing at Ensenada, Mexico. With the arrival of perfect weather the boating and biking crowd have come into their

own; the bicycles may come in handy as we begin to feel the fuel shortage crunch. This reporter spent an enjoyable week visiting the family in her native Connecticut but admits to being glad to be back in the warmer climate.

As of this writing, spring has really arrived in Santa Paula bringing the heady aroma of orange blossoms from nearby orchards. At this moment we are enjoying the crop of Valencia oranges and avocados will soon be ripe for our station guacomole fans. —Terri Myers

CEA sponsored racquetball offers individual and family memberships

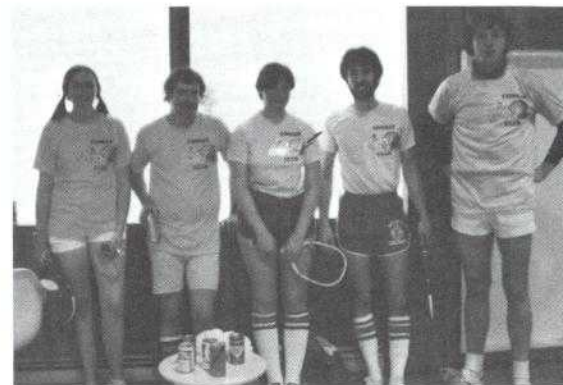
If racquetball's your game you might like to know that COMSAT now has its own Racquetball Club; and you can belong.

The first tournament of the COMSAT Racquetball Club was held in January at Merrifield, Virginia, with 33 players participating in the single elimination event. T-shirts were awarded top finishers in both men's and women's competition followed by open court play and a social hour.

Because of the success of the initial tournament, a second competition was held in April at a larger facility in Alexandria providing additional court time for players. A third tournament scheduled for July is in the planning stage.

The COMSAT Racquetball Club was formed to promote racquetball play and to make membership open to all COMSAT Employees Association members and their families. Family members are entitled to participate fully in all club-sponsored events and to share in tournament prizes. Dues for membership have been set at \$5 for individual memberships and \$7.50 for family memberships.

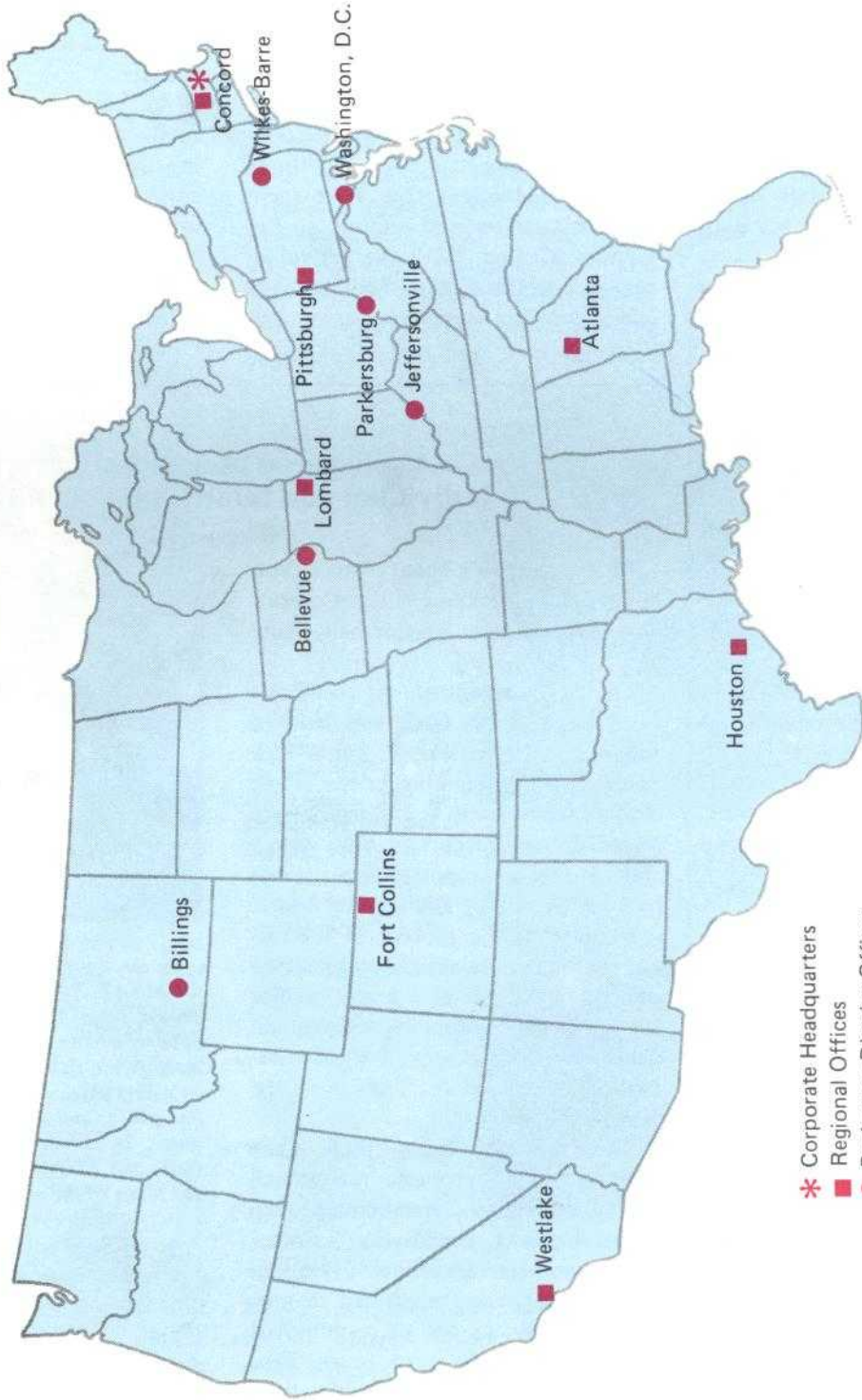
CEA members interested in joining the Racquetball Club may contact Paul Howard or Jean de Vera at the Plaza.



In the top photo the winners of the first COMSAT Racquetball Club Tournament shown from left to right are: Marilyn Moore, women's second place; Dave Gilomen, men's first place; Lisa Cooke, women's first place; Mike Donnelly, men's second place; and Jerry Wilkens, men's third place. In the bottom photo, Lisa Cooke (left) and Marilyn Moore are shown during finals of the women's competition.



ERT Facilities



- * Corporate Headquarters
- Regional Offices
- Project or District Offices

ERT

ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.
636 Virginia Road, Concord, Massachusetts 01742

Rio Piedras,
Puerto Rico