COMSAT
Communications Satellite Corporation

TODAY

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Early Bird's 25th Anniversary

Six Who Were There

See page 4.

FINAL ★★

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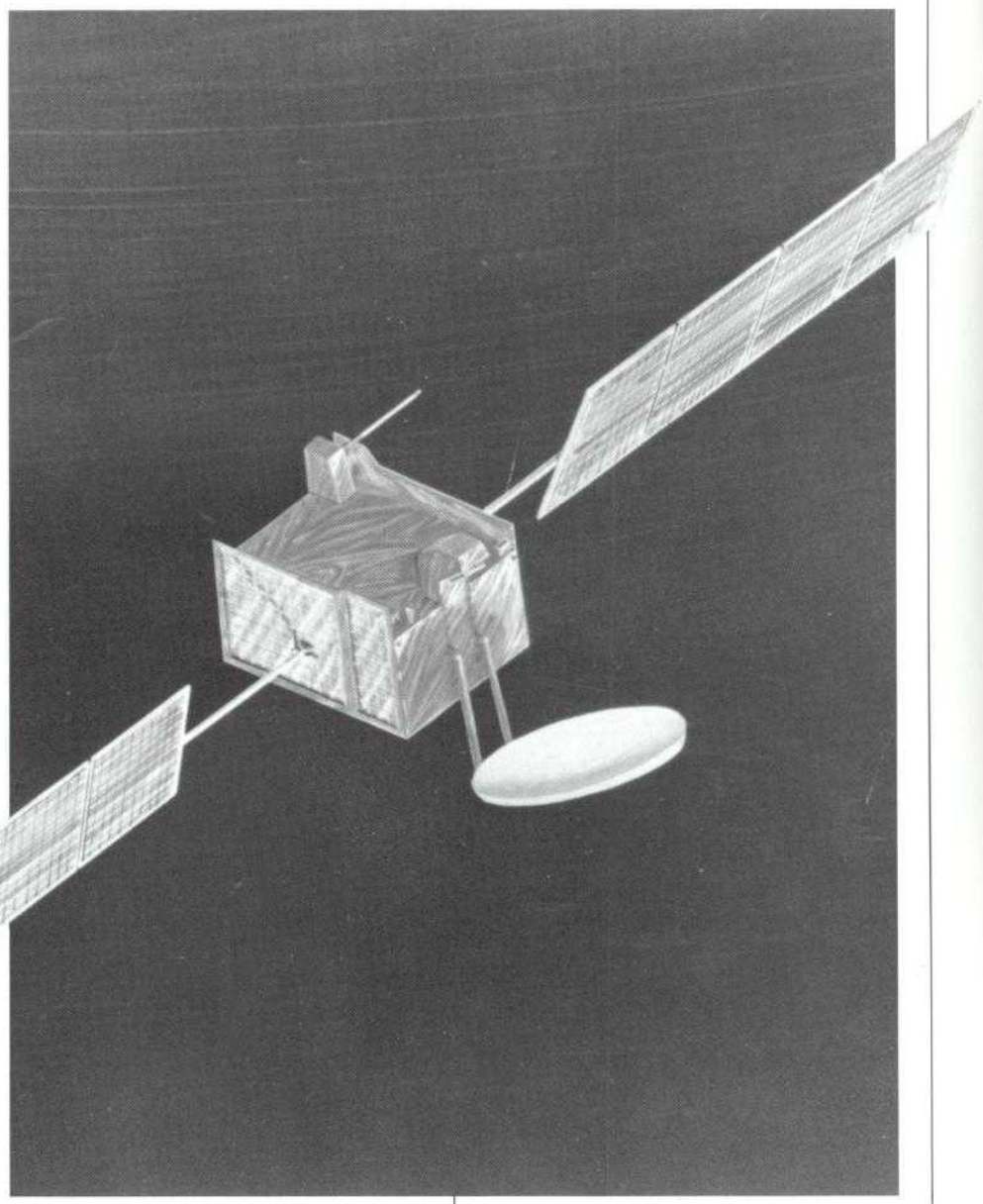
'TALKING STAR' FLUNG IN ORBIT

It's a Switchboard in Space

Published by COMSAT Corporate Affairs (202) 863-6800

Intelsat Board of Governors Decides on Orbital Slot for New Intelsat K

The Intelsat Board of Governors has announced its decision to place the new Intelsat K in orbit above the 338.5° east longitude when the satellite is launched in December 1991. The orbit, which was decided upon at the March Board of Governors meeting, will allow the spacecraft to provide excellent coverage of Europe, including most of the countries of Eastern Europe.



Steady Progress

Since Intelsat made the decision to procure a high-powered Ku-band satellite last June, General Electric's fabrication of the Intelsat K has been progressing steadily. Plans call for the spacecraft to be delivered by May 1991 and launched the following December. This time frame will allow the satellite to provide coverage of the 1992 Olympic Games from Barcelona, Spain and Albertville, France.

The new spacecraft will provide users with more Ku-band power than any previous Intelsat satellite. Users can get two broadcast quality television signals in each transponder with antennas in the five to nine meter range. It will also provide communications between North America and Europe, as well as the capability to downlink with virtually all major South American cities with its two spot beams.

The spacecraft consists of 16 54-1-1 Mhz linearly polarized transponders delivering a peak e.i.r.p. (effective isotropic radiated power) of 52 dBW in Europe and North America. These transponders can provide up to 32 high quality television channels using 1.8-3.5 meter earth stations. The Intelsat K's high power, which enables the use of very small antennas, makes the satellite ideal for applications such as satellite news gathering, International Business Service (IBS), Satellite Master Antenna TV (SMATV), and Direct Broadcast Satellite (DBS).

The Intelsat K also offers an "uplink broadcast" capability. For example, programming could be uplinked from both Europe and North America and then downlinked in a single beam, either in Europe or the Americas. Another significant feature of the new satellite is that it permits simultaneous downlinking in two regions with only one uplink signal. While two transponders are needed, this feature provides a full broadcast capability over the spacecraft's beam coverage area. With one uplink from North America, for example, broadcast to Europe on one transponder and to the Americas on a second will be possible. ■

Second Front Page

New Labs Associate Director Sees to the Details

Hans Weiss is a detail man.

"In technical work, always go after the details," he says. "The details will make the big picture, not the other way around."

As the new Associate Director of COMSAT Labs, Weiss will be working with all the Labs' departments, making sure the company's details are attended to.

As one of only four COMSAT employees to spend 25 years with the company to date, Weiss started his career by helping develop techniques for the selection of earth station sites and actually picked many domestic and international sites himself.

One of the main concerns in siting earth stations is interference, a problem that Weiss has spent most of his career addressing.

"Trying to reduce the effects of interference is what I call 'negative engineering'," he says. "When you first design something you do normal engineering; you want to produce the best possible signal.

"But as you increase the number of satellites and the number of systems, you have to reuse frequencies," Weiss adds. "With that, you get the danger of interference that can adversely affect transmission quality."

An International Concern

The question of interference is an international concern. To address it among many other problems, the United Nations created the International Telecommunication Union (ITU). Since 1968, Weiss has made important contributions to the work of the United States in the ITU.

"Many space stations are not from the United States," Weiss explains. "The whole world has systems up there.

"It's no good transmitting what can't be properly received," Weiss says. "So all the countries get together and discuss methods of co-existing." Weiss has done work on international standards and methodologies that allow communications systems to maximize the usefulness of the available spectrum.

"My concern right from the beginning has been international communications," Weiss adds. "After all, radio waves don't recognize international borders."

Recently, Weiss was involved in the international negotiations that resolved conflicts between Intelsat, Pan Am Sat, and Orion.

"I tried to resolve the situation with my knowledge and experience—to the equal dissatisfaction of all sides," he says, smiling. "There was a great deal of gnashing of teeth, but the alternative was no solution at all."

Out To Clarksburg

Weiss takes on his duties at Clarksburg having most recently served as Vice President, Technical Policy in World Systems Division. At WSD he formulated company technical policy in dealing with domestic and international rule making. In his new position, he will be number two officer in charge of the Labs, responsible for co-administering the scientific work there.

"In the positions I've held at COMSAT, I've had to be conversant with all the disciplines. Because of this requirement, I've had a great deal of interaction with the Labs," Weiss says.

"I'd like to be a sort of middleman between the corporation's operating arms and its research arm," he adds.

And, of course, there will be the details.

"Look at what happened with that satellite (Intelsat VI)," he says. "Someone overlooked the details."

"Never take anything for granted, because details will make or break you," Weiss says. "I keep rediscovering that over and over." ■

Cable Restoration In the Atlantic Ocean Region

COMSAT Operations Services has been busy this year providing cable restoration service in the Atlantic Ocean region. Traffic from the following cables was routed via Intelsat's 338.5 east longitude satellite. The cable restorations this year are:

■ TAT-6 - Traffic equivalent to five hyper-groups (or 4000 voice grade circuits) between January 3 and March 5 due to a cable break 1,000 miles off the coast of France.

■ TAT-8 - Restoration of the cable took place on February 16 and 17. Traffic equivalent to three 45 megabit carriers was provided between Roaring Creek, Pennsylvania, and Pleumeur Boudou, France, due to noise on the French leg of the cable.

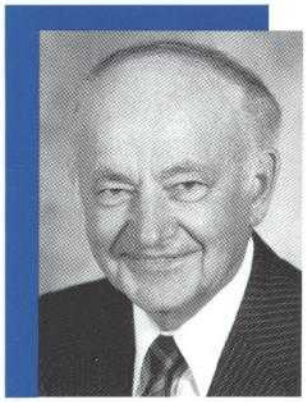
■ PTAT - Six E-1 carriers, four T-1 carriers and one 45 megabit per second carrier were utilized between earth stations in Holmdel, New Jersey, and Whitehill, United Kingdom, during the first week of January due to modifications required to put the Bermuda leg of this cable into service.

Early Bird's 25th Anniversary

Six Who Were There

With the launch of Early Bird on April 6, 1965, the age of commercial communications satellites was born. Although 25 years later the achievement is often taken for granted, the period surrounding the first launch was an exciting one for COMSAT, its employees and for the entire world.

Here are the personal reminiscences of six pioneers who contributed to COMSAT's early success. They were there when it all began.



Joseph Charyk

Dr. Joseph Charyk became COMSAT's first President and a director shortly after the corporation's founding in 1963. He was elected Chief Executive Officer in 1979 and served as Chairman of the Board from 1983 until his retirement in 1985.

On the evening of April 6, 1965, a distinguished group of invitees, including then-Vice President Hubert Humphrey and Senator Walter Mondale watched a TV screen at COMSAT headquarters. Glistening white under a barrage of floodlights stood a Delta rocket on a launch pad at Cape Kennedy. It was being prepared to launch the world's first commercial communications satellite. In a few moments something dramatic would happen and, whether good or bad, it would have a major impact on many things and many people. In those moments, I recall, a myriad of thoughts raced through my mind.

Did these people have any idea of the complexity of the undertaking? Did they know how much depended on the judgment and skill of just a handful of people? Had they thought of what the effect would be if one day all countries of the world would be linked in real time for all kinds of communications and information exchanges? If the launch was successful, how soon before the significance of the accomplishment would be degraded by the cynics and how soon before "me too" groups arose and sought to share the opportunities that success would bring? If the launch failed, who would lead the Monday morning quarterback and what would happen to the visionary policy of the United States to bring the potential benefits of satellite technology to the world? Had my decision to accept the presidency of COMSAT been a wise one and had I done the right thing in persuading this talented group of scientists and engineers to join me in trying to create a new communications world?

As the Delta rocket cleared the launch pad with a deafening roar and moved rapidly out of sight, cheers and applause erupted and con-

Scientist-Executive

Joseph Vincent Charyk

Special to The New York Times

WASHINGTON, May 2 -- Joseph Vincent Charyk might be the prototype of the bright young space scientist-executive.

At the age of 44, he is president of the Communications Satellite Corporation, which put in operation today its first link in a worldwide television system. He also has an impressive list of academic, industrial and Government positions behind him.

Man in the News

He is tall and trim, with brown hair and eyes. He is a quiet man but quite articulate quiet man but quite articulate, and he brings the humanities into all but the most technical discussions.

Like many others, he came to space through aeronautics, drawn by the powerful magnet of a great teacher.

Dr. Charyk was born at Canmore, Alberta. He already had a Bachelor of Science degree from the University of Alberta when he went to the California Institute of Technology to study under the Hungarian Dr. Theodore von Karman.

Air-Minded Students

That was in 1943, and Dr. von Karman was already turning air-minded young students into apprentice spacemen by developing small rockets to help lift heavy bombers off airfields and carriers.

The young Canadian also acquired a master's degree - doctorate with honors and a wife, the former Edwina E. Rhodes. She was a student in the then primitive field of aeronautical computing.

Princeton University decided at war's end to expand its technical training and asked Dr. Charyk to help.

"The idea of going to a classical institution, rich in the humanities, that was going to attempt a blend of

Chase Ltd.

Space specialist with his feet on the ground

cone materials for intercontinental missiles and saw the beginnings of the Polaris missile program.

Moving to Aeronutronic Systems, Inc., in 1956 as the first director of its missile technoljogy laboratory, he headed Project Far Side, "a first cheap step toward the moon."

"This was one of the first attempts to really go out into space," he said recently. "Sputnik hadn't flown then and the work was -- well, partly smuggled. People wondered what kind of a wild goose chase you were on."

In 1958, Dr. Charyk became chief scientist of the Air Force. Six months later he became its Assistant Secretary for research and development. In another six months he became Air Force Under Secretary.

These were the years of the Minuteman missile, the early Air Force space efforts and such trying Washington

"In a few moments something dramatic would happen and, whether good or bad, it would have a major impact. . ."

gratulatory remarks were already being made. But I knew that it would still be awhile before the satellite would be in a transfer orbit and that it would be days before it would be in synchronous orbit and we would really know if our project had been a success or a failure. Deep respect and admiration surged in my thoughts for Sid Reiger, Sid Metzger and the inspired and dedicated group of engineers they had assembled and who had worked so intensively and so effectively. For their sake, especially, I hoped that all would continue to go well. Years from now, I thought, they will hopefully be able to take pride in being the pioneers who created a new communications world.

Little did I dream, though, that, on the 25th anniversary of the launch of Early Bird, we would be living in a radically changing world in which communications and information technology had produced apocalyptic effects. These, in turn, have brought us so much nearer to the world peace and understanding that had been the distant glimmering beacon at the dawn of the satellite communications age on the exciting day in 1965. *Reprinted with permission from* Via Satellite.

Bert Edelson

Burton I. Edelson has been involved in satellite communications for 30 years—in the Navy, at COMSAT and at NASA. He is currently a fellow at The Johns Hopkins Foreign Policy Institute.

I watched the Early Bird launch on TV with Vice President Hubert Humphrey who was then, as chairman of the National Aeronautics and Space Council, my boss. I was a staff member on the Council, the one responsible for satellite communications. I was a Commander in the Navy and had been working on military satellite communications before they sent me over to the Space Council staff.

The Vice President had been invited to the launch and asked me to accompany him. He sat in the front row with a number of dignitaries including Senator Walter Mondale. I sat in the last row.

There was a great deal of excitement and some worry that the launch vehicle might explode or drop the satellite into the ocean—which frequently happened in those days. Most of the people present had never visited Cape Canaveral, never seen a launch. We didn't have much live TV in those days—it had to be piped in by microwave relay. (Somewhat ironic, having to view a communications satellite by terrestrial communications!)

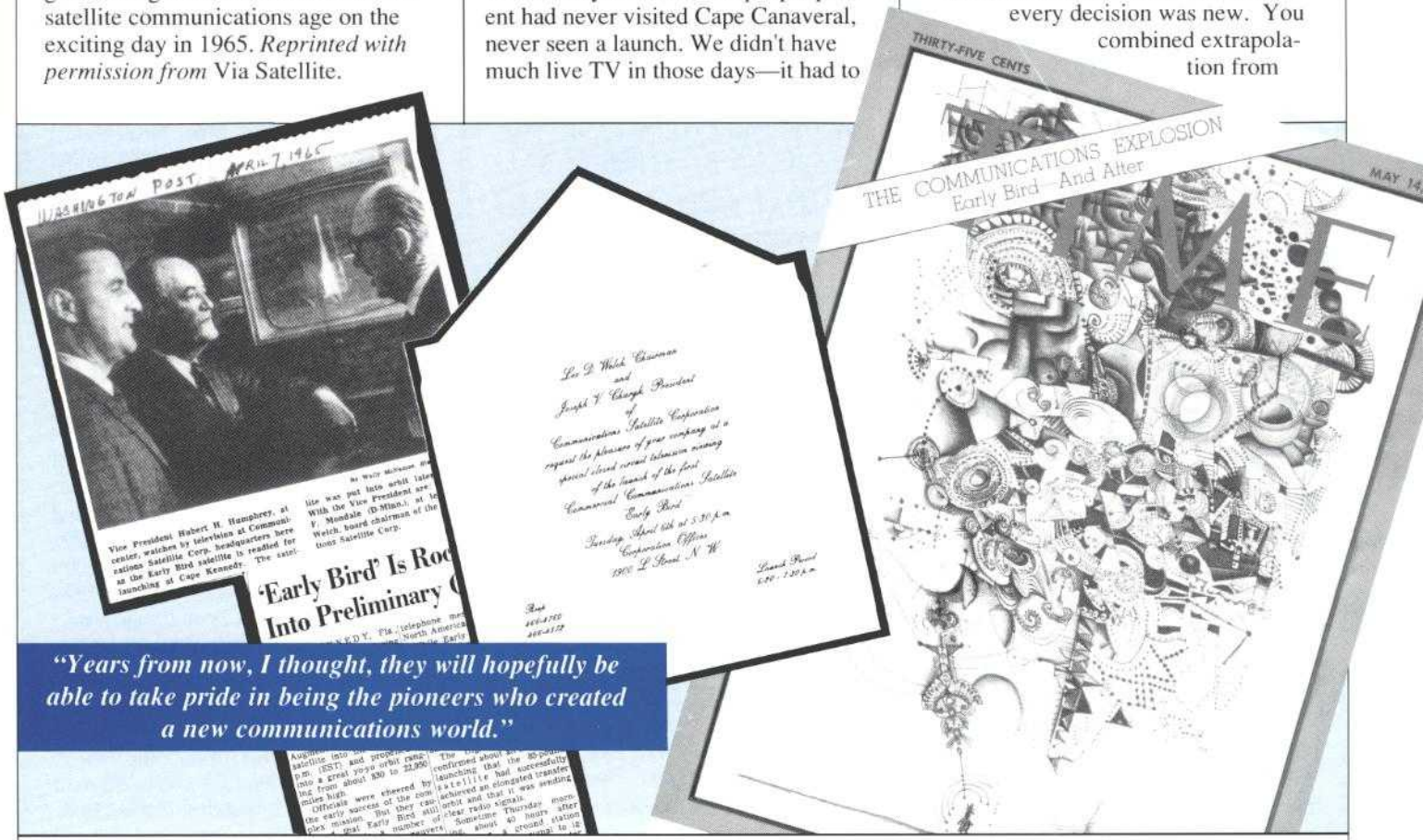
As an engineer, I may have been more impressed than others since I understood how a satellite worked, what it took to get it in orbit, and all the things that might fail. Fortunately for us all, it was a great success.

Hans Weiss

Hans Weiss joined COMSAT on August 3, 1964. He was recently appointed Associate Director, COMSAT Labs.

I had only been at COMSAT for six months, so I was just a water carrier when Early Bird went up. I really didn't have a clearly defined position. I was just learning the business—everybody was trying to do a little bit of everything. I wasn't in a particular department either. Whenever a problem cropped up, you went to work on it.

Everything was so new. Every step, every decision was new. You combined extrapolation from

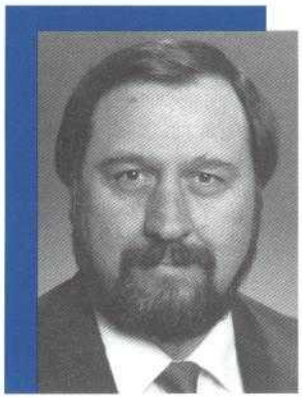


"Years from now, I thought, they will hopefully be able to take pride in being the pioneers who created a new communications world."

things that had been done with your own ingenuity and initiative to find the solutions to problems.

I only vaguely remember the launch—I was probably an usher or something. I remember Humphrey sitting in the front row with a group of other visitors in front of a large TV screen.

I didn't have any other function in the proceedings, I was just a member of the technical staff.



Alexander Yenyo

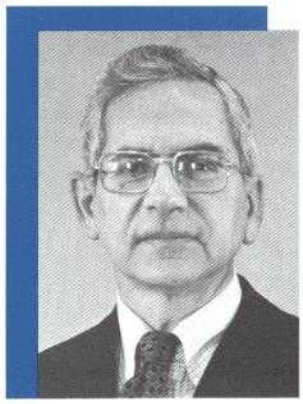
Alexander Yenyo joined COMSAT on October 19, 1964. He is currently the manager of computer operations at COMSAT Video Enterprises.

Back when Early Bird was launched I was just a computer operator. My role in the scheme of things was to take the paper tape tracking data that came in from the Johannesburg earth station for orbital calculations and convert it into punched cards for the engineers to process.

I was at 2100 L Street, right down there in the computer room with all the engineers from Hughes and COMSAT. I particularly remember watching Don Williams from Hughes, whose eyes were constantly glued to the lights on the computer while it was running the orbital calculations. He was very intense.

I had such a small part in it that I really have no great anecdotes to tell, just a little different perspective. You really felt you were part of the space program, and that really appealed to me at the time.

Everything was new, everything was exciting. There was a real camaraderie then. Working for COMSAT back then was an adventure, and even though my involvement was small, I am glad that I was a part of it.



Sid Metzger

Sid Metzger was the manager of COMSAT's engineering division at the time of the Early Bird launch. He later went on to become vice president and chief scientist before retiring in 1982.

Upon coming to COMSAT in June 1963 as Manager of the Engineering Division, I found that the Engineering Division consisted of only one person, myself. So my first job was to hire people. In the next few months I was joined by Emeric Podraczky, Jim Potts, John Puente, Rob Briskman and Sy Bennett.

COMSAT leased AT&T's Andover, Maine experimental earth station to be used with Early Bird. Built in 1962, it had been used with the Telstar and Relay satellites.

Shortly before our launch, AT&T became concerned with the rough operation of some large cylinder bearings on the azimuth axis of the 60 foot horn antenna. Several cracks were found, leading to a crash project to have replacements made at the local Oxford Paper Co. machine shop in Rumford. These were completed expeditiously, so another possible catastrophe was avoided in the nick of time.

The first days prior to the launch were chaotic, since we had AT&T engineers there (they owned the station), New England Bell since Andover was in their territory and Bell Labs engineers because they had designed the station and were implementing changes needed to adapt to the Early Bird system. Hughes engineers were there because they were the only ones in the whole world who had experience in performing the telemetry, tracking and command (TT&C) functions to guide the satellite to its proper position in orbit, and COMSAT engineers were there because it was our project. Our people included Jim Potts and Laury Gray for RF equipment, and Andy Werth for TT&C equipment. Bill Young was our station manager, Alan Coburn was of help to all, and I was responsible for the entire Andover operation. After some persuasion, all five groups agreed to relinquish some sovereign autonomy and all of them worked together smoothly and efficiently.

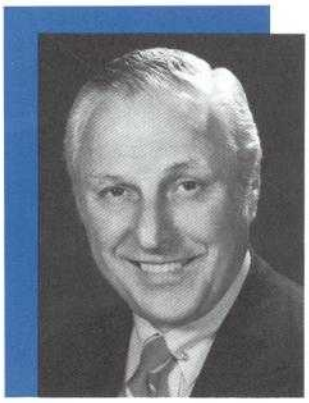
A cliff-hanger occured shortly before we were to fire the apogee motor. It is essential that the spin axis of the satellite be properly oriented during motor firing. To achieve this, a "polarizer" in the earth station antenna is adjusted to measure the angle of the incoming satellite signal. Such measurements had been made on previous passes over Andover but the latest readings indicated that the satellite's attitude had shifted, or that the polarizer had slipped on its shaft.

To check the latter possibility, an engineer would have to ride several miles to the boresite tower on Black Mountain. Then, the earth station antenna would have to point over from the satellite to the tower and recalibrate the polarizer.

Unfortunately, there wasn't enough time for all this. In a discussion with the COMSAT control center at 2100 L Street we realized that if the satellite attitude in space had indeed changed, this could only be accomplished by ejecting peroxide from the satellite tanks. However, if this had inadvertently taken place due to a leaky valve, the peroxide pressure would read lower. Since that was not the case, the difference must have been due to the polarizer slipping on its shaft and it could be ignored.

We proceeded to fire the motor based on the assumption that the satellite was oriented properly. This was the case, and it now seems very logical, but at the time we had a nagging feeling that

perhaps there was something else we were overlooking. In later launches we sadly learned that this sometimes happens. *Reprinted with permission from* Via Satellite.



Bruce Sundlun

Bruce Sundlun was appointed by President Kennedy as a COMSAT Incorporator in 1962 and has served as a member of the company's Board of Directors throughout its history. Today, he is a businessman in Providence, Rhode Island.

The thing I remember about that day was that I had taken my three young sons with me to watch the historic launch at COMSAT headquarters. Someone took a picture of us that was really extraordinary. In fact, I still have it in a frame. The boys were 10, 11 and 12 at the time, and it was one of the best pictures I ever had taken of the four of us.

From a business standpoint, I remember people being surprised that we could launch Early Bird as quickly as we did. Basically, it was somewhere less than two years after the Incorporators were appointed that the launch took place. What was considered to be remarkable was that somebody could take a law and turn it into a working piece of hardware in such a short period of time.

There was tension there in the room where we watched the launch because the stakes were so high. But I remember Joe Charyk coming up from a downstairs control room and telling us that, up to that point, everything had worked. ■

COMSAT's Ivor Knight Reelected Telecommunications Committee T-1 Chairman

Ivor Knight, COMSAT's director of International Systems Standards, has been unanimously re-elected to a second two-year term as chairman of the Telecommunications Committee T-1.

Committee T-1, sponsored by the Exchange Carriers Standards Association, was formed in 1984 after the AT&T divestiture and includes all major telecommunications manufacturers and carriers in North America. Knight has been active in the organization since its formation, holding various leadership offices including the position of vice chairman.

Knight has also maintained an active role in the International Telephone and Telegraph Consultative Committee (CCITT), a global organization which develops telecommunications standards. He also holds the chairmanship of a study group in the area of network assessment. Within CCITT, he has contributed to the development of international standards for the use of both satellite and fiber optic cable systems for the Public Switched Telephone Network and the developing global Integrated Services Digital Network (ISDN). He has also been active in the standardization of tariff and charging procedures for ISDN.

Knight joined COMSAT in 1969 and has been involved with standards setting activities throughout most of his 20 years with the company. ■

Twining Named COMSAT Director, Broadcast Services

Robert Twining has been promoted to director of broadcast services, COMSAT World Systems Division has announced.

Twining will be responsible for developing new broadcast services and for the management of COMSAT's sales and marketing activities within the U.S. and international broadcast communities.

Previously, Twining had been a COMSAT video sales account manager, responsible for major international television and radio accounts. He has more than 10 years experience in the international telecommunications area, having worked prior to joining COMSAT at Intelsat and at Cable & Wireless.

He holds a B.S. in economics from Georgetown University and an M.B.A. in finance from George Mason University.

NASA Picks Three Labs' Research Proposals

Three research proposals submitted by COMSAT Laboratories were among eight accepted recently by NASA to help maintain U.S. preeminence in satellite communications. The proposals were submitted by the Labs under the Satellite Communications Applications Research Program (SCAR). SCAR was established to support promising satellite-based communications technology systems.

COMSAT Research Proposals

Under the leadership of the Network Technology Division's Dilip Paul, COMSAT will examine the commercialization of intersatellite links (ISLs). Direct connectivity by ISLs between colocated or closely spaced communications satellites can make future satellite networks and services more reliable, capable and competitive with alternate technology.

COMSAT will assess and update commercial communications requirements and satellite traffic and service projections in the INTELSAT/Domsat networks. The results of this study will provide NASA with valuable insight into the usefulness of ISLs, both in potential commercial markets and in support of future demands for services and capacity.

Based on the results of this program, COMSAT will develop ISL requirements for NASA. This approach should pave the way for a successful ISL technology transfer and could result in the definition of joint NASA/commercial ISL experiments and hardware development that will greatly promote the commercialization of optical ISL technology and services capability.

Broadband ISDN

The second proposal, led by Tom Inukai of the Network Technology Division, involves exploring the potential for using satellites for broadband integrated services digital network (B-ISDN). Satellite B-ISDN with on-board baseband processing technology will benefit many commercial and public organizations by providing cost-effective services for high-speed private networking, thin-route broadband services, emergency communications, high-volume data distribution, internetworking, and the integration of commercial services and NASA space missions.

This task will consist of a study phase and proof-of-concept development phase. The study phase will investigate the most recent CCITT recommendations for B-ISDN requirements. The program's second aspect will be devoted to the design, development and testing of a proof of concept prototype model of an on-board fast packet-switching subsystem, based on the results of the Phase 1 study.

HDTV Codec

The third Labs research proposal, called "Flexible-Rate HDTV Codec," is being managed by Dr. Lin Nan Lee. Due to their point-to-multipoint distribution capability, satellites are ideally suited for HDTV distribution. The proposed digital HDTV codec will be based on an algorithm suitable for cost-effective hardware implementation and will be designed with maximum flexibility.

After completion of the study phase, the most critical technique used by the algorithm will be breadboarded and tested to prove the algorithm and hardware implementation. In the final phase a proof-of-concept prototype for demonstrating the feasibility and performance of the complete flexible-rate HDTV codec will be fabricated. ■

Acknowledgements to the Clarksburg publication Sideband.

John Deere Chooses IBS

Deere & Company, one of the world's largest producers of agricultural equipment, working with Overseas Telecommunications, Inc. (OTI), has chosen to implement COMSAT's International Business Service (IBS). The service will link the company's data center in Moline, Ill., with its manufacturing facility in Mannheim, West Germany.

The new 128 kbits/s private line will enable the company's design engineers in the U.S. and Europe to utilize a common data base. In addition to batch transmissions, the satellite link will support interactive applications for engineering, manufacturing and accounting functions. Deere personnel on both sides of the Atlantic will have simultaneous and interactive access to the same information, helping to improve Deere's product development.

Here is how the Deere network is configured. The link utilizes Ku-band capacity on the Intelsat satellite located at 335 degrees east longitude. COMSAT will provide all-digital communications service to OTI, one of 20 carriers which takes IBS from COMSAT. The OTI 6.1 meter antenna in Detroit, Mich., is approximately 150 miles from Deere's Illinois facility. In Europe, the Deutsche Bundespost 13 meter antenna located in Usingen, approximately 200 kilometers from Mannheim, forms the other end of the link. The use of earth stations close to customer premises minimizes dependence on terrestrial facilities, contributing to overall network cost reduction and improved quality.

"With this international link," says Bill Coopman, John Deere's manager of telecommunications, "our engineers here and abroad will be able to work together more efficiently to deliver new and enhanced products faster to farmers." ■