COMSAT

Communications Satellite Corporation

TODAY

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COMSAT Aeronautical Services Off To A High-Flying Start

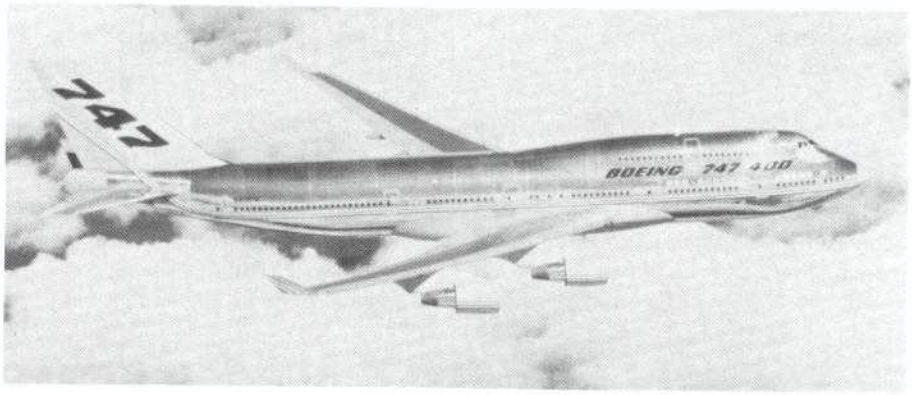
September was a busy month for COMSAT Aeronautical Services as the division announced two separate arrangements to provide airborne communications services.

COMSAT and GTE Airfone announced they will work together to allow Airfone customers to make phone calls to anywhere in the world from commercial airliners on international flights. Under the agreement, GTE will use COMSAT's network of earth stations; COMSAT will also provide the space segment for the service via the INMARSAT network.

Currently, Airfone customers can only place calls while flying over the continental U.S., southern Canada, Puerto Rico, the Virgin Islands, or within 200 miles of the U.S. coast. Since Airfone will be able to utilize the INMARSAT network, its coverage will be extended worldwide.

In another joint project, COMSAT and Sony Trans Com, are developing a satellite delivered real time news and information service for passengers on international flights. Sony Trans Com will build the cabin display equipment and associated hardware. COMSAT will transmit the service via its earth stations and provide the space segment via INMARSAT. The service, known as Flight News℠, will be delivered on a screen in the form of text and graphics.

These arrangements have attracted attention in both the trade and mainstream press. For more details on COMSAT's Aeronautical Services, turn to page 3. ■



By mid-1991, GTE Airfone users will be able to place calls from passenger jets on international flights, like this Boeing 747, to anywhere in the world under a new agreement with COMSAT Aeronautical Services.

Circuit Court Judge Dismisses Pan Am Sat's $1.5 billion Anti-Trust Suit Against COMSAT

On September 14, a federal district court judge in New York dismissed in its entirety a $1.5 billion anti-trust suit filed by Pan Am Sat against COMSAT on the grounds that agreements entered into by the U.S. government and INTELSAT and the International Organizations Immunities Act conferred immunity on INTELSAT signatories, including COMSAT, from such actions.

At the time the lawsuit was filed, COMSAT expressed confidence that it had no merit and was groundless. COMSAT pointed out the suit was particularly ironic because it was COMSAT itself that worked successfully on Pan Am Sat's behalf in the INTELSAT consultative process to facilitate the coordination necessary for Pan Am Sat to begin operations.

"We are absolutely delighted that the court found no basis for allowing this suit to continue. COMSAT operates fairly, legally and effectively. We now look forward to putting this matter behind us and getting on with our business." said COMSAT Chairman and CEO Irving Goldstein.

Several media reports have said Pan Am Sat plans to appeal the decision. ■

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Senior Management Approves Broad Strategy Aimed At Growth And Development Of New Services

On September 13-16, the senior management of the Corporation gathered in Hamilton, Bermuda to review the strategic business plan for the years 1991-1993 for all corporate elements. A broad strategy was approved for the Corporation that reflects substantial growth in all areas, and promotes development of many new services. Obviously, for competitive reasons, the Corporation cannot publish for broad consumption certain specific goals and directions of its strategic plan. There are, however, some general direction trends that can be discussed.

Senior Management focused closely on the level of projected earnings for 1991-93. Revenue issues within CVE were carefully addressed. In addition to pursuing related lines of business in CVE, expenses must be reduced in the hotel part of the business in order to allow more revenues to flow through to the bottom line. The taking of depreciation of new INTELSAT and INMARSAT programs will also have an adverse impact on expenses, and thus earnings. These trends will be countered by development of a wide range of new service offerings in all corporate elements. A very high value is being placed on innovation and strong responses to our customers' evolving needs.

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While Mobile is experiencing very rapid growth, it also has capacity issues it must resolve. The next three-year period will see introduction of aeronautical and foreign land mobile services. CSD's new International Ventures unit has significant promise and CSD overall generates a positive cash flow, contributes profit at the bottom line and is not capital intensive.

The principal issue for INTELSAT Satellite Services is finding additional capacity to meet the strong growth of ISS's many customers. New emphases for the future include development of thin-route services to third world countries, and development of international point-to-multi-point (VSAT) services. ■

INTELSAT VI Rescue Update

The INTELSAT VI (F3) satellite launched into low earth orbit last April, is still foremost in the minds of a group of scientists at COMSAT Laboratories.

The satellite, scheduled for rescue and reboost during a space shuttle mission in 1992, is the object of intense research and experimentation concerning the condition of its solar array said Tom Kirkendall, manager of semiconductor reliability and quality assurance in the Labs' Microelectronics Division.

In the rarefied atmosphere at low earth orbit, ultraviolet light from the sun reacts with oxygen to form atomic oxygen, a highly reactive gas. Scientists at COMSAT fear the gas poses a threat to the micro-thin silver interconnects on the satellite's solar array. Each of the more than 24,000 interconnects is only one sixth the thickness of a page of *Today*.

"Normally silver is relatively resistant to oxidation," said Kirkendall. However, atomic oxygen is more reactive than normal oxygen and will cause the silver interconnects to oxidize. This causes two difficulties said Kirkendall: First, the silver oxide formed is a poor electrical conductor, and the performance of the solar array will degrade. Second, unlike most oxidized metals, silver oxide will flake away, exposing the rest of the silver interconnect to further erosion. Most metals form a protective oxide blanket that would guard the rest of the metal from further degradation.

In an effort to determine what condition the solar array will be in by the time of the shuttle mission, a group of scientists from the Labs Microelectronics, Satellite Technology and System Development Divisions, got together in a coordinated effort to solve the problem.

First, a computer model was created to determine the total amount of atomic oxygen the satellite would be exposed to. Second, actual silver interconnects were sent to NASA laboratories at the Marshall and Johnson Space Flight Centers. Both facilities have access to equipment to produce atomic oxygen. There, the interconnects were exposed to atomic oxygen, and the rate of oxidation was measured.

The third part of the experiment was carried aloft by the shuttle Discovery this month. Two experimental packages were attached to the shuttle's remote manipulator arm and exposed to atomic oxygen. The first package contains two solar panels identical to those on the INTELSAT VI. The other package is designed to discover the rates of oxidation for the interconnects at three different temperatures. The samples will be returned to the Labs for analysis following the mission. Test results and a recommendation on a course of action should be ready by December.

Initial support for the project came from the Intelsat Satellite Services Division. INTELSAT is providing the funding for the shuttle experiments. ■

Second Front Page

With Beginning Of Aeronautical Service, COMSAT Marks New Milestone

(Second of two parts)

COMSAT last month began an important new chapter in the annals of its contributions to satellite communications.

For the first time, COMSAT will provide clear, thoroughly reliable transmissions that only satellites can deliver between planes on international flights and any other point on earth.

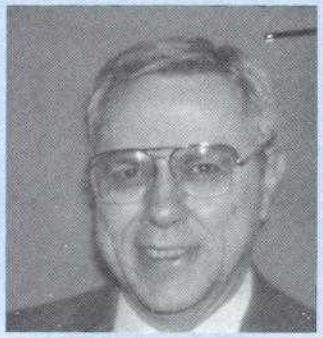
The introduction of aeronautical services stands with two other major milestones in company history: the first international transmission a quarter century ago and the first maritime service in 1976.

"COMSAT is extremely pleased to extend the benefits of satellite communications to the aviation industry," said Dr. Elizabeth L. Young, vice president, COMSAT Aeronautical Services. "Communications via satellite will open the door to new options, such as private telephone conversations, fax and computer-to-computer links. But more important will be the added security of having clear, reliable connections available no matter where you are flying."

COMSAT has begun using its earth stations at Southbury, CT, and Santa Paula, CA, to operate with the INMARSAT satellites in the Atlantic and Pacific ocean regions. The first aircraft making use of the services is expected to be an FAA Technical Center Boeing-727, with a new United Airlines 747-400 taking service in early October.

COMSAT Aeronautical Service's coverage of the Atlantic and Pacific regions — combined with links that will be provided in the Indian Ocean region through an agreement with Japan's Kokusai Denshin Denwa Co. Ltd. (KDD) — permits worldwide service.

Satellite communications is a service eagerly awaited by pilots and owners, for whom safety is priority number one. With it, cockpit crews and air traffic controllers can count on connections always at the ready, instead of the interference-ridden HF radio signals relied on in the past.



COMSAT Aeronautical Services is focusing on three segments of the aviation industry: commercial, government and general, including corporate and private aircraft. Directing marketing efforts in each are Michael Bonard, commercial; David Lipke, government; and Roger McEvoy, general, including corporate and private aircraft.

Airline passengers, too, have warmly greeted the idea of having phone, fax and computer hook-ups available during transoceanic flights. Corporate executives with a need to stay in touch with operations are expected to be enthusiastic users, according to Young.

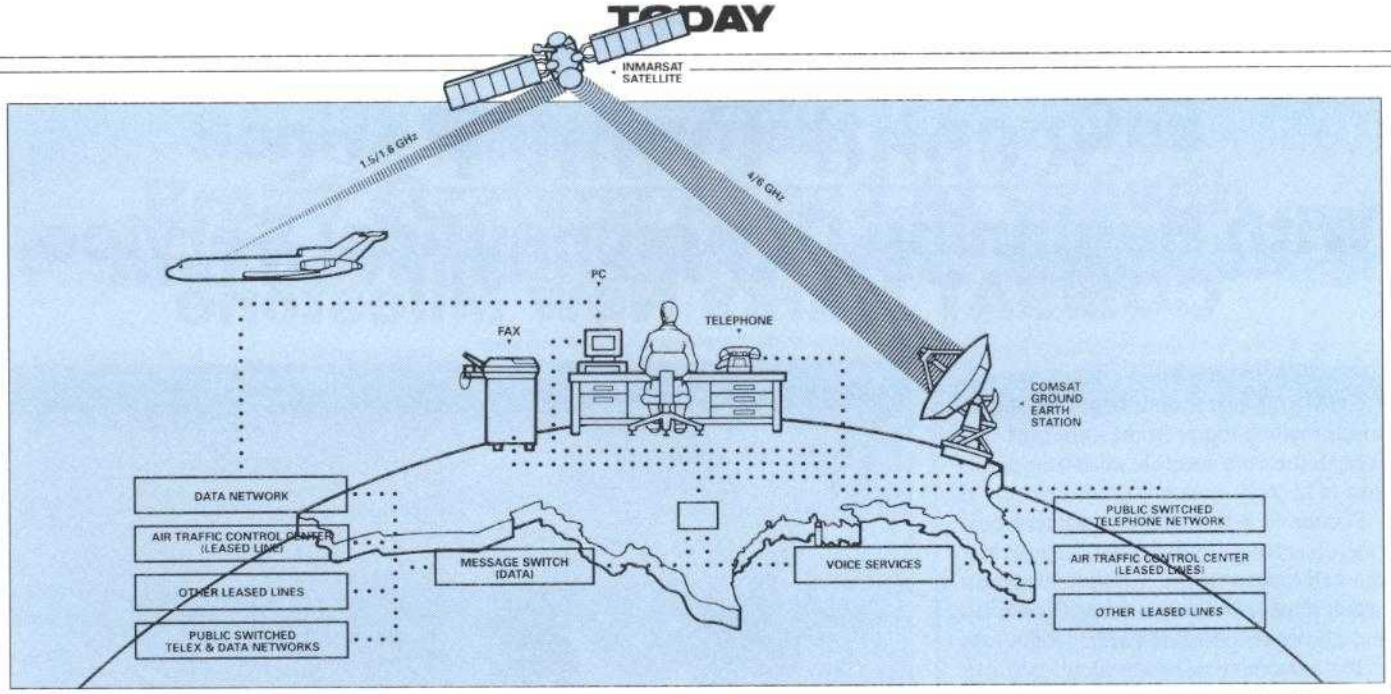
COMSAT's initial offering is a 300 bit-per-second data transmission service, limited to cockpit use. It will handle messages on flight operations, safety, weather and positioning.

By the first quarter of 1991, the company expects to add more advanced communications. DialAir, a two-way, direct-dial voice service, is planned for crew and passengers. It will permit, for the first time, private conversations between aircraft over the ocean and telephones served by the public-switched or private networks the world over. A higher speed data service also is expected to debut later in 1991.

With its service introduction, COMSAT will become the first INMARSAT Signatory to offer data communications via satellite to aircraft in commercial flight. It won't, however, be the first with voice service. British Telecom, Inc. (BTI) is providing airborne telephone links as of this month.

In fact, competition for aeronautical customers based in the U.S and abroad will come from COMSAT's sister INMARSAT Signatories equipping to offer the service. The market is global. COMSAT, for example, can go after business from British airlines, provid-

(continued on page 4)



Air to ground messages are handled via special electronic equipment and an antenna on the aircraft to an INMARSAT satellite. The signal is then forwarded to the COMSAT earth station in Southbury, Conn. or Santa Paula, Calif. The earth station provides the link with other communications networks, forwarding the signal to the telephone, computer or fax machine to which it is "addressed".

*(**Aeronautical** continued from page 3)*

ing the ground connections through the Southbury or Santa Paula earth stations to virtually anywhere on earth. Similarly, BTI can market its services in the U.S., sending traffic from U.S.-based customers through its Goonhilly earth station.

The object for all will be the same: to attract aeronautical traffic through their own earth stations.

By ruling of the Federal Communications Commission (FCC), COMSAT, in its role as U.S. Signatory, is the sole U.S. entity eligible to provide INMARSAT satellite capacity for aeronautical services. But COMSAT's earth stations will face competition in the U.S. in providing the ground portion of aeronautical communications. IDB Aeronautical Communications, for example, plans both east and west coast earth stations that will offer services via INMARSAT, although they will have to obtain space segment from COMSAT.

"COMSAT welcomes all providers whether they come for space or ground segment or both," said Young.

One of COMSAT's important first customers is Aeronautical Radio, Inc. (ARINC), a communications cooperative serving the commerical airline industry with domestic and international air-ground connections. Under a long-term agreement, ARINC will use COMSAT-supplied satellite capacity to provide reliable international links to its member airlines. The agreement leaves room for COMSAT to market its services directly to customers that may also be served by ARINC.

Commercial airlines, with their concern for safety, efficiency and productivity, are just one of COMSAT Aeronautical's three targeted market segements. Also pinpointed are government - civil agency and the Defense Department — and general aviation, a segement that includes private and corporate aircraft. Of the three, the business aviation segment appears most interested right now, said Young. "They want to know how fast they can get the service."

To join the satellite age, owners must outfit their aircraft with either a low- or high-gain antenna, depending on the level of service required, and related avionics. For prices ranging from $250,000 to $500,000, the electronics can be purchased from a number of manufacturers, according to Young. Following installation, the Aircraft Earth Station, as it is called, must be commissioned by INMARSAT to ensure its proper operation with the satellites. It must also be certified by the FAA and licensed by the FCC. After these steps are taken, service may begin.

COMSAT began promoting aeronautical satellite communications a year ago, almost immediately after the FCC ruled that the company could provide the service. Getting the word out continues to be a major priority. A customer newsletter, "Aerofacts" is published regularly. Brochures and other sales literature are available to explain the services and requirements customers must meet to take advantage of them.

Plus, to gain visibility and establish an industry presence, COMSAT Aeronautical Services is becoming a regular exhibitor at the major airline industry trade shows: the National Business Aircraft Association, the World Airline Entertainment Association, AFCEA, the Radio Technical Commission for Aeronautics and the American Institute of Aeronautics and Astronautics.

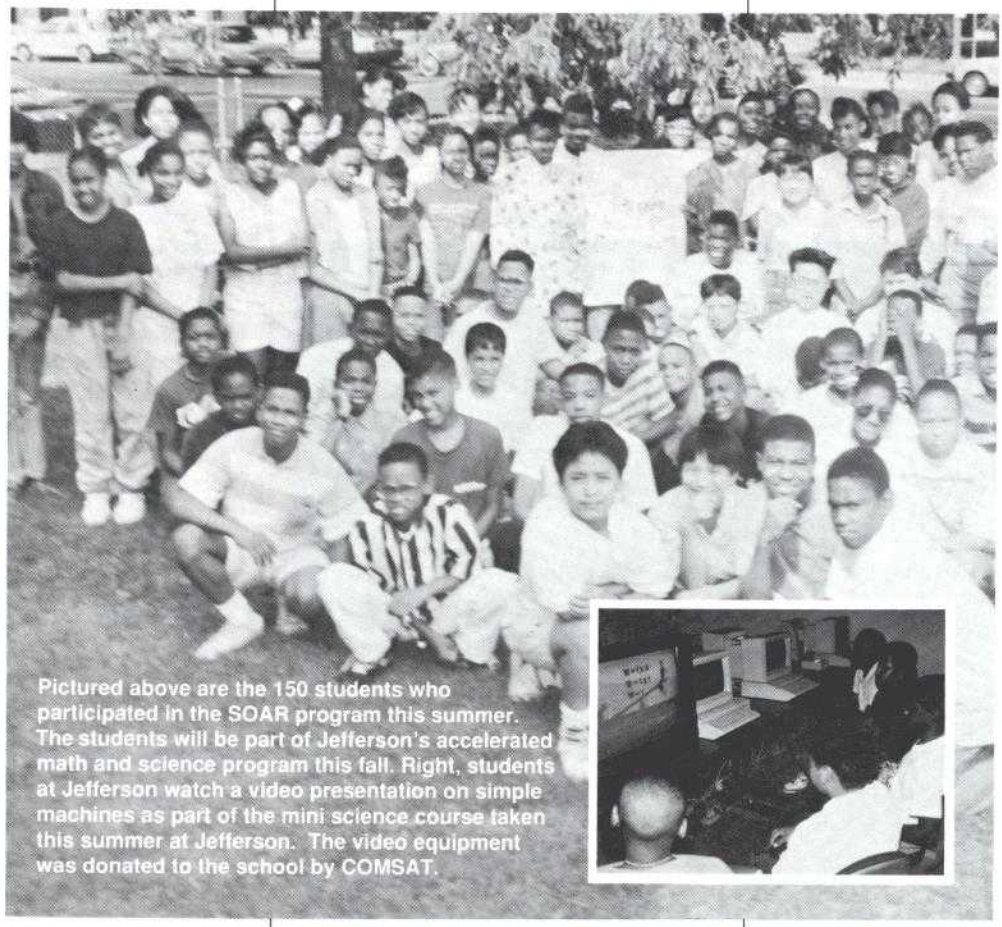
If demand for COMSAT's aeronautical service follows recent trends, its future will be bright indeed. "Demand has tended to follow availability," Young said. As soon as cellular phones and affordable fax machines hit the market, they were enthusiastically adopted. It is her hope that enthusiasm is catching — 30,000 feet in the air. ■

SOAR '90 Helps Jefferson Students Reach New Heights In Math And Science

While many schools in the Washington area remained empty this summer, over 100 students filled Jefferson Junior High School to get a head start in improving their math, science and writing skills.

SOAR '90: Special Opportunities for Analytical Reasoning, cosponsored by COMSAT and Jefferson, brought 150 students from around the District to help them develop the skills necessary for high achievement in math, science and writing. This Fall, all the students (who entered Jefferson as seventh grade students this Fall) who participated in the program have been entered into Jefferson's special math and science program.

Special Opportunities for Analytical Reasoning, cosponsored by COMSAT and Jefferson



Pictured above are the 150 students who participated in the SOAR program this summer. The students will be part of Jefferson's accelerated math and science program this fall. Right, students at Jefferson watch a video presentation on simple machines as part of the mini science course taken this summer at Jefferson. The video equipment was donated to the school by COMSAT.

For four weeks during July and August the students attended classes designed to integrate the three subjects under one theme: shapes.

In the science portion of their coursework studied shapes and simple machines. Students analyzed simple machines like levers, pulleys, screws and inclined planes. During their studies students discovered that more complex machines are really just many simple machines linked together. Students then ventured to build their own machines with motor driven kits and erector sets. Eventually they built industrial robots, not ones that simply walk and talk, but rather types that perform complicated tasks like controlling traffic lights.

The math segment of the course was designed to give the students a strong background in identifying shapes, and how to determine their size. Students also spent time in a mini-course to develop creative writing skills. Although the students concentrated on honing their grammatical skills, special emphasis was placed on unlocking their creative side.

The studies in this part of the course were aimed at one objective: to get the students to write imaginative perceptive essays about their lives.

This year marks the second in COMSAT's five year commitment to the faculty and students at Jefferson Junior High School. To find out more about how you can get involved call Corporate Communications at **x6800.**■

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"Komputers For Kids" Returns With The New School Year

Due to the ever increasing technical demands of our society, computer education has become an increasingly vital part of children's education. The basic computer skills that students learn at Jefferson can only serve them well later in life.

Fortunately, Jefferson can turn to two programs to help defray the often high cost of computer equipment. Again this year both Giant and Safeway food stores are running programs to donate computers to Washington area schools.

Schools are awarded computers, printers, and software based upon how much money in cash register receipts they collect. Both Giant and Safeway programs run from this month through March, 1991. Giant register tapes are white; Safeway's are pink.

Parents of Jefferson students are saving and collecting the receipts themselves, but they certainly could use our help. Remember to save those register tapes and place them in the "Komputers For Kids" boxes outside the employee cafeteria in Clarksburg, and in the elevator lobbies in the Plaza.

This is a project all COMSAT employees can help out with. So save those register tapes. We will keep you abreast of the tally in *News Update*. ■

Following the completion of the SOAR program in August, Jefferson Principal Vera White and the students presented COMSAT with an album containing photos of the students while in the classroom and examples of their work. Below are just a few examples of the creative writing assignments incoming seventh grade students completed during the course.

Shapes In My Life

My life is one big circle. For example, going to school. When I go to school, I go the same way every day. I go out of the house, walk down the street, and get on the bus every day.

Going home is like coming, I go out of the school, walk down the street, and get on the train every day.

So you can see my life is like one big shape: a circle.

My Life of Shapes

You could say my life is like a triangle more than anything. See, most of the time I go straight like other kids. Then I get into a corner. It's sometimes hard to turn a corner because of sacrifices I would have to make. After I take that final turn, I start moving up in life. I may get a perfect score on a test or get promoted to a different job. I keep climbing until I reach the top. Then I start to fall, not very fast but gradually. I know I'll always reach the top again.

My Life is Like a Triangle

My life is like a triangle, it can have different shapes and points. It can be made how I want to make it. Of course it will still have its three sided figure, but it is up to me to make it slanted, crooked or straight.

In my life which is like a triangle it will have different lengths that will grow and grow and grow even more until it reaches the stars. I don't mean I want to be an astronaut, but I want to be great in any profession I plan to be in.

I wouldn't call myself square because I have a sense of humor and I am not strict.

I wouldn't call myself circle because I don't do the same things over and over again.

So I guess you could say my life is like a triangle.

The Employee Assistance Program Is Ready To Lend A Hand

When times get difficult it's always good to know that we can turn to someone for help. There are very few of us who can expect to go through life without experiencing any major personal crises. That's why COMSAT's Employee Assistance Program (EAP) is ready to help.

"EAP helps to assure continuing performance and productivity by providing an outlet for employees with mounting personal problems to resolve them before they affect work performance," said an employee relations consultant in COMSAT Human Resources.

Calling 1-800-888-CARE puts you in touch with Personal Performance Consultants (PPC), a private company hired by COMSAT to provide our EAP services. The professionals at PPC will help you contact a counselor who is convenient to either your home or office. You then make your own arrangements to see the counselor.

Many companies provide EAP's, but very few offer one as comprehensive as COMSAT's. COMSAT's program includes up to eight prepaid counselling sessions and covers the complete range of personal problems such as marital or family concerns, financial pressures, and alcohol or drug abuse. Most other companies limit the prepaid sessions to four and restrict the scope of covered problems.

Some employees might be concerned that the counseling is not confidential. That is not a problem with COMSAT's EAP. All counseling is absolutely confidential. COMSAT has no interest in knowing and no way to know who the users are. COMSAT contracted with a private firm to provide the counselling, and the firm is obliged by patient-client privileges to never divulge who the user is unless he or she authorizes the counselor to do so. ■