INSIDE

- GMSS applications
- Light aircraft satcoms
- MSAT alpha trials

MSAT NEWS

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TMI engineers delighted following early tests

In October, TMI Communications staff began alpha tests of the MSAT Network by making calls from remote areas of the country in vehicles equipped with MSAT Communicators™ capable of placing voice and data calls though the mobile satellite communications system.

"We were very impressed with the power of the system," says Allister Pedersen who conducted tests with one vehicle in British Columbia and the Yukon. "It is amazing to be travelling through a remote area such as the Spatsizi Plateau wilderness park in the interior of northern British Columbia and just pick up the phone and call anywhere in the world."

More than 500 voice calls and 60 data connections were successfully made during the West Coast alpha trial. More than 186 kilobytes of data were downloaded and saved in one on-line connection. "While mobile, we were able to log onto corporate electronic mail and the Internet and remain on-line for an extended period without any loss of data," says Mr. Pedersen.

A second test vehicle travelled through Northern Ontario and Quebec, and a third went through Labrador and the Atlantic Provinces. Along with MSAT Communicators™, the vehicles were equipped with monitoring equipment to record test results. Those results are currently being analyzed by TMI engineers.

In addition to confirming that calls could be made from a wide variety of remote locations, the testers sought to determine how the hardware would perform in a mobile environment. "We were trying to break the network and to find out if environmental factors, such as vibration or dirt, would impair functioning," explains Mr. Pedersen.

The calls were made through AMSC-1, one of two satellites that will provide mobile satellite communications to all of North America. A second satellite, TMI Communications' MSAT, will be launched by Arianespace in French Guiana by April 1996. ●

John Farrell (left), TMI Communications' President and CEO, spoke with Jacques Lyrette (below), President, Communications Research Centre, over the MSAT Network in Ottawa recently. "The sound quality was excellent — exactly the same as during an international call over conventional phone lines," says Mr. Lyrette.

The vehicle pictured in the background had just returned from a trip of more than 6 000 kilometres, during which successful test calls were made from locations throughout northeastern Canada.

Photos: John Brebner/CRC

MSAT joins the curriculum

Students in the Northwest Territories will soon be studying MSAT satellite communications as part of a new curriculum on natural resources.

Project Rocks is a teacher resource package that is being developed for the Canada/ NWT Mineral Initiative. One volume includes information about the use of MSAT communications by the natural resources industry.

The MSAT material can also be pulled out for use in other science courses, says Jane McMullen, the developer of the package. "Educational materials specific to the Northwest Territories are very hard to come by. It will be easy for teachers to adapt this material for teaching about communications in the North."

A significant amount of material in Project Rocks focuses on the history of radio communications in northern communities. Fittingly, MSAT is the latest chapter in this story. ●

RFP for terminals being prepared

A Request for Proposal (RFP) is being prepared by Government Telecommunications and Informatics Services (GTIS) to choose firms to supply mobile earth terminals. The RFP will put GTIS in a position to provide the best range of options to its clients at the best possible price, says Al Kingan, Product Director, GTIS Satellite Services.

The RFP will determine what equipment will be available from GTIS for MSAT users in the federal government. As *MSAT News* went to press, the specifications for voice and data terminals were being finalized.

"We have to consider that not all terminals will be available immediately," adds Mr. Kingan. "Westinghouse will be the first to offer its product, so the initial terminals we are purchasing for our market trials will come from them. Mitsubishi's terminals are expected early next year and Narrowband's SCADA terminals will be available once the packet-switched data service their terminals require comes on line in the third quarter of 1996."

Wide range of possible applications

There are potential applications of the Government Mobile Satellite Service (GMSS) in virtually every government department, says Alex Carrillo of the GTIS account management team. "Our clients are constantly surprised at the many options available to them through this service, especially the briefcase terminals," she says.

One recent example is at the House of Commons: members of Parliament representing remote ridings have expressed a strong interest in MSAT. "We are providing six terminals during our market trials for MPs requiring voice and data communications while travelling in their ridings," explains Ms. Carrillo. The briefcase terminals will eventually allow them to place calls and to send data or faxes by connecting a laptop computer to the briefcase terminal.

Another potential client for the briefcase terminals is Justice Canada, says Mike Sabourin of the GTIS account management team. "Travelling judges often need access to information in legal databases that is currently difficult to get," he explains.

GTIS account management team ready for action

The training for the GTIS account management team and the marketing support materials they will use to serve customers are now essentially complete, says Keith Fagan of GTIS.

The final training on the new system was completed this summer. One-day sessions were held in St John's, Montreal, the National Capital Region, Toronto, Winnipeg, Calgary, Vancouver and Whitehorse to fill out sales managers' knowledge of the new system.

However, an additional technical course is available on request for sales staff who want to provide further assistance to clients interested in developing new applications for the system. "We are receiving some requests from people who have very specific requirements, but do not have the technical expertise to implement them themselves. This additional course will prepare our people to help these clients meet their specialist needs," explains Mr. Fagan.

For more information about GMSS, contact your local GTIS account manager or phone (613) 990-4444. ●

Fixed services through a mobile communications network

Ironically, one of the major markets for MSAT services will be fixed telephone service.

It is technically possible to provide traditional phone service just about anywhere in Canada, but it can be very expensive, explains Doug Woywitka, MSAT Project Manager at Northwestel, an MSAT service provider in northwestern Canada. "You only have to travel 50 kilometres out of Whitehorse before the cost becomes prohibitive even for large companies."

For that reason, Northwestel has launched a major campaign to promote MSAT to businesses and individuals looking for fixed phone service in remote areas. Compared to what most people in Canada pay for fixed telephone service, MSAT is expensive, at approximately $5 000 a terminal plus time charges, says Mr. Woywitka. "For many locations, however, it is the best option. There is no other service that offers the same features at a comparable price."

For the most part, Northwestel expects to sell the service to business customers such as those in the mining, logging, and gas and oil industries. There will also be a number of residential customers, Mr. Woywitka adds. "Some people with cottages or fishing and hunting camps will decide that the additional security provided by fixed phone service is well worth the cost." ●

MSAT News

MSAT News is produced by Industry Canada to increase awareness of the MSAT Program and related technologies. It is published on an as-required basis, approximately once every three months. The department will continue to publish the newsletter until the project is completed.

If you would like to begin or stop receiving *MSAT News*, or if you have moved and wish to inform us of your new address, please contact Hugh Reekie at:

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Ottawa firm makes satcom possible for light aircraft

CAL Corporation of Ottawa has begun manufacturing an aeronautical terminal that will make satellite communications available to the general aviation market for the first time.

These aeronautical terminals, called CALQuest, will operate over mobile satellite communications networks in a similar fashion to cellular radio, but with a much greater range. Cellular cannot be used on aircraft at all because of safety regulations and interference.

The aeronautical terminal, developed by CAL under contract to American Mobile Satellite Corporation, consists of a modified Westinghouse Mobile Earth Terminal and an aeronautical antenna subsystem developed by CAL. The subsystem is made up of a steerable antenna and a three-dimensional geomagnetic field sensor that determines aircraft attitude. This sensor has a complex electronic "compass" that processes geomagnetic information and is not easily influenced by magnetic disturbances created by the aircraft's engine or avionics. CAL is using the technology under license from the Communications Research Centre, which first demonstrated it in an Ontario air ambulance aircraft in 1994.

CAL has also taken the first step towards producing a version of the new aeronautical terminal for use in helicopters. An experimental version of the terminal was installed on board a Sikorsky S-76 air ambulance this September in a series of tests done in conjunction with the Communications Research Centre and Huisson Aviation. The engineers succeeded in overcoming a number of potential problems to establish high-quality, two-way voice links between the helicopter and CAL and TMI Communications offices, says Larry Maynard, a consultant with AstroCom Associates who worked with CAL during the trials.

Photo: John Brebner/CRC

CAL Lab Manager Brian Thompson makes adjustments to one of the mobile satellite aeronautical terminals that the company is developing.

Mobile satellite communications have not been possible for small aircraft until now because existing systems are very expensive (typically $120 000 or more). They also require the aircraft to have large and complex avionics to support the steering system that keeps the antenna oriented towards the satellite as the aircraft manœuvers.

The CALQuest terminal is considerably less expensive than existing systems and is self-contained, with all of the required avionics — front-end signal processing and antenna steering electronics — located in the CALQuest transceiver and antenna assemblies. ●

TMI Communications Update

MSAT Network goes live

TMI Communications' MSAT Network is up and running.

TMI Communications has made thousands of successful calls from all across Canada, including the far North, during tests of the new system. "Testing to date has exceeded our expectations," says John Farrell, TMI's President and CEO.

Commercial service will be available later this year through a network of MSAT service providers (see "MSAT service providers," right). The MSAT Network will be Canada's first mobile satellite communications network offering a range of mobile and stationary voice and data services. It is expected to take three years before any of the other currently planned mobile satellite systems are available to the public.

A new MSAT descriptive brochure is available. For your copy, contact Terry Brukewich at TMI Communications: tel. (613) 742-4123; fax (613) 742-4130; E-mail (Internet) T.Brukewich@tmi.telesat.ca

MSAT service providers

Here is a list of contact names and numbers for the national service providers that have signed on with TMI Communications.

Mobility Canada 1-800-927-0125

Glentel 1-800-784-1721

Interested persons may also call any of the following Glentel sales representatives:

Jacques Laferrière *Quebec* . . . . . .(514) 941-5921
Clark McFadden *Ontario* . . . . . .(416) 258-9197
Simon Barker *Alberta* . . . . . .(403) 680-4040
Darek Wistrak *British Columbia* . . . . . .(604) 961-7197

Government Mobile Satellite Service . . . . . .(613) 990-4444
or contact your local GTIS account manager.

For more information about MSAT service providers, call TMI Communications at 1-800-216-MSAT. ●

Road to alpha trials long and hard

Getting to the stage when alpha trials of the MSAT Network could begin was a complicated process involving years of work by a large number of people.

Late this summer, Westinghouse Electric Corporation turned over control of the Communications Ground Segment (CGS) to TMI Communications and alpha trials began. Westinghouse was the primary contractor responsible for delivering the CGS, which is the heart of the MSAT Network. More than 15 000 requirements had to be verified before TMI could grant provisional acceptance of the system.

Some of these requirements were verified with low-level procedures done at the Westinghouse plant and witnessed by TMI engineers; many were conducted more than a year before the system was delivered. The balance of the requirements were met using formal tests, also witnessed by TMI engineers. A special database was created to keep track of all the verification requirements.

One low-level verification test consists of a code walk-through and the associated test of a software routine. As part of the verification, engineers check every line of software code used to carry out various processes, or "threads." One such thread is the call set-up from a regular phone in the PSTN (public switched telephone network) to an MSAT Communicator™. The engineers produce a flow chart of the many processes involved, including the following:

- the caller lifts the receiver and dials the number
- the CGS establishes that the number is a valid one
- the CGS then determines whether the MSAT Communicator™ can receive the call by looking up its features and capabilities in a database

Photo: Janice Lang/CRC

TMI Communications' John Forsey and Mario Babineau discuss features of the software used to conduct a 30-day load test of the new Communications Ground Segment while Karel Kosar, Bell Canada, Claude Lemire, TMI Communications, and Bob Turkus, Westinghouse Electric Corporation, look on.

- a message similar to a paging signal is sent to the MSAT Communicator™
- if the MSAT Communicator™ is free to receive a call, it will return an appropriate signal (if not, an appropriate voice response — such as busy or number unobtainable — is sent to the PSTN caller)
- the CGS continues the call-set-up process by allocating an RF channel from an available pool.

TMI has had to assemble a team of experts to complete the overall testing and commissioning process of the complex CGS. In future issues, *MSAT News* will provide more information on the various test processes.

B. C. firm to provide SCADA terminals

Narrowband Telecommunications Research Inc. has developed a terminal for transmitting SCADA data over the MSAT Network.

The firm is producing its RST 2000 MSAT Communicator™ to provide reliable and economical full-duplex communications using the MSAT packet-data service. The stand-alone terminals can be used for a variety of applications, including remote weather data collection, remote asset management and SCADA (Supervisory Control and Data Acquisition) telemetry for utilities and the petroleum industry. They can also be used as transportable data terminals.

The unit is equipped with two RS-232-C ports, so existing data monitoring and control devices can be connected to it. A DB-9 port allows a computer or terminal (VT100 emulation) to be hooked up for local configuration, for sending and receiving messages and for testing. The unit can also be configured from a remote location. Once set up, the Narrowband RST 2000 is completely transparent to the SCADA user.

The terminal also includes modem technology developed at Industry Canada's Communications Research Centre and licensed for use by Narrowband.

A number of different operating modes — standby, continuous and manual — are also available. The 2.5-kg terminal measures 22 by 30 cm and is 7 cm high. It is extremely rugged in construction and is designed to operate in temperatures ranging from -40°C to 60°C. The terminal runs on 12 volts DC. It consumes less than 3 mA on standby mode, 600 mA in receive mode and 1.6 A in transmit/receive mode.

For more information on the RST 2000, contact Mahmoud El Banna at (604) 294-8577. You may also fax inquiries to (604) 294-8579 or write to:

Narrowband Telecommunications Research Inc.
470-6450 Roberts Street
BURNABY, B. C.
V5G 4E1

For information on SCADA services available with MSAT, contact TMI Communications at 1-800-216-MSAT. Federal government personnel may contact Government Telecommunications and Informatics Services at (613) 990-4444. ●

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