User Applications Unique to Mobile Satellites

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As AMSC enters the market with its mobile satellite services, it faces a sophisticated user group that has already experimented with a wide range of communications services, including cellular radio and Ku-band satellite messaging.

AMSC's challenge is to define applications unique to the capabilities of its dedicated L-band satellite and consistent with the provisions outlined in its FCC license.

Through a carefully researched approach to its three main markets -- aeronautical, land-mobile, and maritime -- AMSC is discovering a wellspring of interest in corporate and general aviation, trucking companies, pipeline monitoring and control companies, maritime management firms, telecommunications companies, and government agencies.

This paper will provide a general overview of AMSC's FCC license and corporate history, and discuss the specific applications unique to each user group.

Today's conference is a testament to the fact that there is tremendous interest within the scientific and governmental communities in mobile satellite services (MSS). For the American Mobile Satellite Corporation (AMSC), a company on the cutting edge of this technology, a primary challenge is to succinctly define user applications so that the mass market will embrace this new technology.

Mass market acceptance of MSS should be of great interest to the government and scientific communities because of the accompanying decreases in mobile earth terminal, space, and ground segment charges that a large consumer and business user base will make possible.

As AMSC enters the MSS market, we face a relatively sophisticated user base that has already been exposed to satellite technology's mobile applications, albeit via systems that are not pure MSS in the L-Band. The Geostar and Qualcomm systems, for example, together have approximately 20,000 Ku-band land mobile satellite terminals on order. Qualcomm is the market leader in applications of satellite positioning and data messaging to the land-mobile sector, with 7,000 units deployed, primarily to large trucking companies, and Geostar follows with 2,000 units. These units are relatively low priced at a cost of under $4,000 per unit. AMSC's mobile earth terminals, which will be available in November for beta testing, will be priced similarly.
Qualcomm and Geostar have achieved these numbers in just over two years, whereas the INMARSAT system needed 13 years to reach a deployment level of 10,000 mobile, primarily maritime, units, at a substantially higher cost of about $30,000 to $40,000.

As AMSC prepares to offer its low speed data messaging and position determination services in the fourth quarter of this year, our challenge is to define unique, value-added services that can serve our three principal markets: land-mobile, which includes trucking, private automobile, oil well drilling, pipeline management and government applications; maritime, which includes ships as varied as Coast Guard cutters, large and small yachts, and inland waterway barges; and aeronautical, which includes services for operational, administrative, and passenger communications.

Before looking at an overview of how AMSC will address these challenges, a review of AMSC’s corporate history would be appropriate.

The mobile satellite technology that will be utilized in the AMSC system is an outgrowth of years of NASA experimentation with mobile satellite technologies, dating back to the 1970’s.

NASA took the lead in identifying a market for MSS and later petitioned the Federal Communications Commission for frequency allocations. Industry interest in the U.S. was so intense that within a two year period, from 1983 to 1985, twelve applications for MSS service were filed at the FCC.

The FCC found that in order to use the limited MSS spectrum most efficiently, the applicants should together form a consortium.

Eight of the original twelve applicants agreed with this principle, and in 1988 they formed the American Mobile Satellite Consortium, now known as the American Mobile Satellite Corporation. In 1989 AMSC received its FCC license authorizing it to function as a common carrier for the provision of domestic mobile satellite services to air, land, and maritime users.

AMSC functions in a unique environment. We at AMSC share the excitement and challenges common to many new companies, while at the same time we benefit from a corporate parentage of established, major telecommunications companies, namely Hughes Communications Mobile Satellite Services, Inc.; McCaw Space Technologies, Inc., a subsidiary of McCaw Cellular; MTEL Space Technologies Corp., the owner of the Skytel nationwide satellite paging system; Mobile Satellite Corporation; North American Mobile Satellite, Inc., whose parent company is Millicom Cellular; Satellite Mobile Telephone Company, Skylink Corporation, and Transit Communications, Inc. It’s worth noting the large cellular and paging companies which are backing the development of L-Band mobile satellite services.

AMSC’s FCC license authorizes us to operate three spacecraft to provide all domestic mobile satellite services -- land, sea, and air -- to users in the continental United States, Hawaii, Alaska, Puerto Rico, the Virgin Islands, and 200 miles of coastal waters. The AMSC license obliges AMSC to construct and launch a mobile satellite system that will serve as a national communications resource.
for the United States of America.

Clearly, mobile satellite services offer universal coverage while moving. Not only will AMSC provide complete coverage of the U.S., even in rural and mountainous areas, but through an agreement with Telesat Mobile Inc., the Canadian operator of a domestic mobile satellite service, users will receive seamless service while on the go between Canada and the U.S. In addition, we are negotiating an agreement with the Mexican government to provide land mobile services. A seamless hand-off system will interconnect domestic aviation using the AMSC system and international aviation.

The AMSC satellites will be high capacity birds, with central load sharing and an effective EIRP much higher than in other mobile satellites. While the exact parameters of our satellite are still being defined, we anticipate that AMSC's MSAT 1 spacecraft will have a nominal power of 55 dBW.

AMSC will optimize usage of our space segment by offering service to a wide variety of user groups. We have defined several major applications that we are now actively marketing to our three major markets. In the land-mobile sector, these applications include emergency services, car theft prevention, interstate trucking, news gathering, oil exploration, supervisory control and data acquisition, and environmental monitoring. Aeronautical users will be able to benefit from services for passenger communication and cockpit data such as airline operational and administrative information. Many of the same applications common to the land-mobile market -- fleet management, passenger and employee communications, and data transfer -- will be used in the maritime arena. The applications for this technology will continue to multiply as it is implemented, and users discover new solutions for recurring communications problems.

AMSC voice services feature toll quality, communications quality, and emergency services. A variety of data services facilitate the transmission of position reports and "canned" messages, short messages, maps, facsimiles, and forms.

A unique aspect of the AMSC system vis a vis other systems is our ability to establish private networks with private base stations and gateways to the public switched telephone network, public data networks, and other networks. It is through a private network that Rockwell International, our first service provider, will provide mobile satellite services to enhance an existing service, known as the Tripmaster system, that Rockwell markets to the trucking industry.

Data applications will be the hallmark of AMSC's pre-launch services, which we will introduce in the fourth quarter of this year. Services will feature 2-way data messaging at speeds of 300 bps from the mobile earth terminal to the satellite and 600 bps from the satellite to the mobile earth terminal, Loran-C for position determination, and a variety of transmission options, including scheduled, unscheduled, and variable length.

The long-haul trucking industry is one of our main markets for data services. Data messaging applications in the trucking industry include fleet management systems, expert systems for dispatch and other operations, customer

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service, real-time billing, real-time
crediting to drivers, and emergency road
services. Data messaging and position
location services also will be available
after the late 1993 launch of our
satellite, which will provide two-way
voice and high speed data services.
We will tailor our services and support
systems, such as network control and
earth station facilities to the individual
needs of each customer. Our four
primary service packages are full period
channel, shared channel, virtual circuit,
and packet network. The full period
channel service provides customers with
dedicated channels, and the customers
themselves provide the earth station and
network control center. With shared
channel service, AMSC provides
customers with virtual network service,
fixed period circuits, and demand
capacity. The customer provides the
earth station. Virtual circuit service
provides full voice capabilities and
interactive data at speeds up to 9600 bps
on a call per minute basis. Our packet
network service provides standard 128
byte packets and broadcast messages for
mobile response.

AMSC's voice services will not directly
compete with cellular services, but will
supplement cellular coverage in areas
where it is not readily accessible, such as
rural areas and remote industrial sites.
Our North America-wide voice coverage
will enable a car phone's coverage range
to leap from a local cell across the
continent, forming a seamless,
continental cell. AMSC's provision of
both voice and data services also will
allow long-haul transportation
companies, such as trucking, bus, and
railroad operators to access a wide range
of services not available via conventional
cellular phones.

Through AMSC's private networks, users
have direct access to satellite capacity for
voice and data communications. Via this
direct access system, they can operate a
network of one or more private base
stations which operate separately from
the public mobile network and feature
interconnection to the public switched
telephone network. This system allows
our customers to take advantage of
economies of scale available through
management of their own networks while
at the same time benefiting from access
to our space segment.

According to our FCC license, AMSC is
obliged to provide priority and pre-
emptive access to our space segment for
aviation flight safety. Our services will
feature an interface to FAA facilities for
voice and data communications, and
compatibility with Arinc 741, as it is
adopted. Communications with
government and other aircraft will
facilitate air traffic control, operations,
administrative, and passenger
communications.

Government interest in our services is
strong. In addition to government
aviation applications, government
agencies will use our services to improve
emergency search and rescue operations;
to enhance communications during
sensitive law enforcement actions; to
monitor dams and reservoirs; and for
Coast Guard operations.

Under the terms of our launch
agreement with NASA, certain
government agencies will receive free
experimental capacity on our satellite for
a fixed period of time. NASA and
AMSC sponsored a government seminar
in March, at which nearly 38 agencies
met to discuss their applications needs.
We're witnessing a tremendous
outpouring of interest in our services.
We also hope to integrate our services into the new FTS 2000 phone system that the U.S. government is implementing.

To summarize, I would like to reiterate that insofar as the data market is concerned, we see AMSC's unique service offerings as stemming from our ability to establish private networks that offer entrepreneurial service providers the opportunity to bundle their services with ours, thereby offering a new services. AMSC is embarking on a value-added program to work with service providers in the aeronautical, SCADA, maritime, and trucking markets.

With regard to the voice market, we see AMSC as a service that will complement and supplement cellular service, reaching areas even more remote than the 428 Rural Statistical Areas that are slated to receive cellular services.

The applications that I have outlined for you today represent a true revolution in the way North Americans will communicate and the way our businesses will be run. This is just the beginning. As we continue to tell our story to users throughout our country, we are finding new, niche market applications that we had never before envisioned. The market for AMSC's services is fast-growing and ever-changing, and I look forward to keeping you apprised of our successes.