MSAT an Alternative Choice?

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ABSTRACT

The paper describes a number of potential applications of MSAT that utilize the unique properties of this transportation mechanism. Emphasis is placed on the market introduction strategy for the North American system.

INTRODUCTION

Early in the 1970's the use of a Mobile satellite concept was proposed utilizing Spot Beams and Demand assignment Multiple Access technology. However it was not until the 1980's that technology enabled the concept to be taken into a viable business scenario that would allow the launch and management of dedicated satellites for the purposes of Mobile Satellite communication.

As with any potential new service the wheels of progress can move very slowly and it has been only in the past two years that the necessary conditions have been achieved to be able to propose the concepts to the investment communities. Summarized those necessary conditions included :-

a) The availability of spectrum and the agreements necessary to use it for Mobile Satellite services,

b) The degree of cooperation required to allow North America wide roaming,

c) Identified demand for such a service offering

d) Advances in technology to enable a viable business plan in terms of a reasonable cost to the end user.

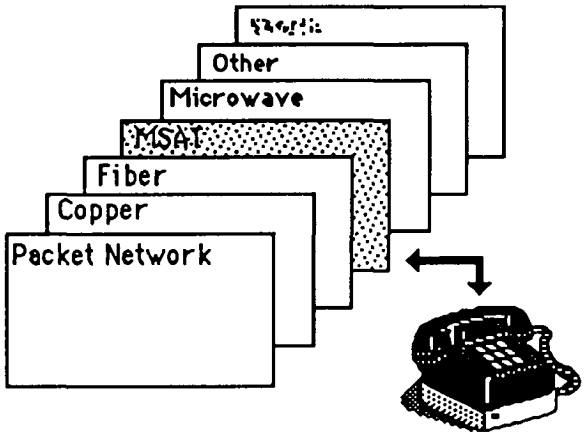

Fig 1
MSAT as an alternate long-line choice

Introducing a new service is a function of the end-user demanding solutions to a perceived problem. In Canada the need for reliable mobile communications in the non-urban areas has been a prime driving force for the MSAT developments. Similarly rural fixed communication has never enjoyed the same ease of use nor the potential for service as that enjoyed by the urban subscribers, and pressure from many rural customers has forced telephone companies to seek innovative solutions to this problem. This has been seen in the past few years in the ILS (Individual Line Service) programs of many of the telephone companies. This, plus the deregulation of many of the traditional telco services has placed enormous pressures on the service providers. MSAT technology (in a non-mobile application) is seen as a way to help relieve those pressures by providing remote, single-channel, low traffic service.

Service Offerings

The easiest way to introduce a new service is to directly emulate existing services, and to do it in such a fashion that the subscriber is unaware of the specific transport mechanism being used. Many would advocate that this strategy removes the visibility of the provider and therefore a competitive advantage. However if MSAT is to be recognized as truly an alternate long-line choice then it must emulate and be compatible with the existing services initially and gain competitive advantage by providing those service in a more cost effective or efficient fashion for specific applications.

The Mobile Satellite proposed for use by TMI (Telesat Mobile Inc.) and AMSC (American Mobile Satellite Corp.) is such that it will provide a "bent-pipe" function only at the Satellite itself, with the intelligence being provided through a Network Control Center. This architecture allows for the maximum flexibility in the assignment of different "Bearer" services on the satellite and to define new services as opportunities are identified. In keeping with the philosophy of emulating existing services four "bearer" services have been identified.

a) Mobile Telephony Service
b) Mobile Radio Service
c) Mobile Data Service
d) Aeronautical Services

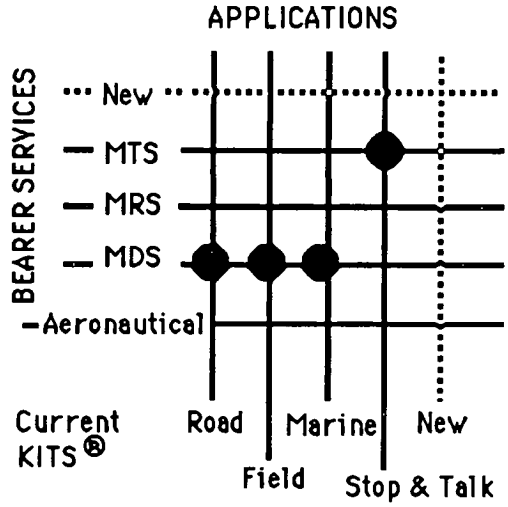

Fig 2
MSAT Bearer service philosophy

Due to the specialized nature of the Aeronautical services for Commercial applications little time will be spent discussing it in this paper. It is sufficient to say that these services can and will be provided on MSAT through the approved agencies.

It is Telesat Mobiles Inc. intentions not to be a manufacturer of hardware, and as such has no vested interest in the recommendation of a specific set of hardware or end-user services. To enable manufacturers to benefit from the MSAT opportunity TMI will make available the specifications of the interfaces to the network with the encouragement for Distributors and resellers to design their own applications to meet their specific customers requirements. These specifications are the intent of a recently released Request for Proposal that will define the final system achitecture for the Ground Segment

The proposed architecture of the MSAT Network is beyond the scope of this paper but is covered in other papers presented in other sessions at this conference.

APPLICATIONS

If one considers the capability of MSAT in both its coverage area and from the fact that it is designed to be used with small inexpensive Mobile Earth Terminals (METS), the scope of potential usage is only limited by the imagination of the intended users. Early applications that have been designed include the following:-

Voice calling. Communication to and from mobile or transportable earth terminals.

Vehicle Location. Automatic Vehicle Location (AVL) will allow a Central dispatcher to monitor the position of a fleet of vehicles, with periodic updates. This will be accomplished using a navigation device on the vehicle,early systems will use Loran-C although other systems such as GPS.are not precluded This can be coupled with other navigation services to allow for optimum routing of a vehicle.

Two-way general messaging. Messages can be sent between a MET and public or private data networks. An electronic mail box would be a value added service to store messages if a MET is unavailable.

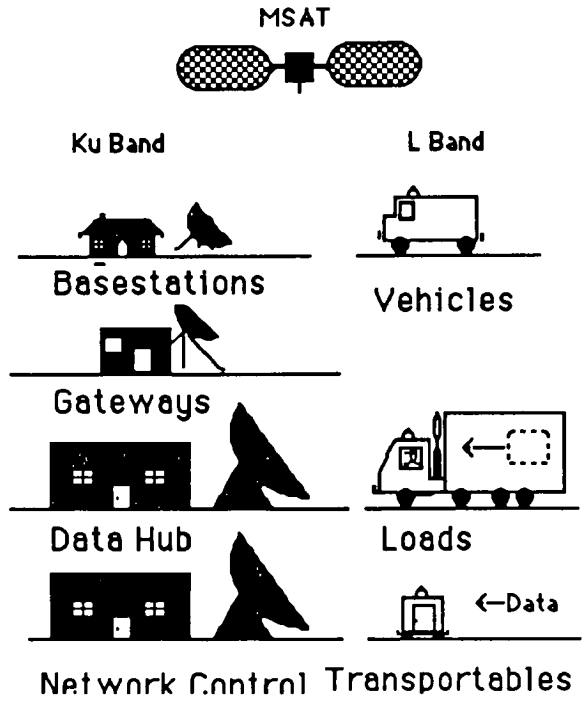

Fig 3
MSAT Vision

File transfer. This would provide for the MET to exchange relatively long files with the Data Hubs. It will be an economic tradeoff as to whether a file should go as packets on the MDS or demand a circuit via the MRS/MTS.

Interactive data. In order to allow for interactive data sessions, the MDS will have the capability of guaranteeing a specified response time. This will be done either on a priority basis or by assigning a TDMA slot for the MET.

Monitoring and control. Supervisory Control and Data Acquisition (SCADA) will allow for monitoring and control METs on a real-time basis.

Virtual circuits. A MET will be able to request a circuit of variable throughput in order to establish a 'virtual circuit'. This would give a user a TDMA slot into which they can put whatever data they wish. From the Data Hub to a MET, the user can be allocated one of the Time Division Multiplex slots on a demand-assigned basis.

The above are Generic capabilities of the MSAT achitecture however if we start now to combine these requirements with other peripheral units the potential is compounded:-

Load Tracking. .... A MET used on a transport vehicle tells you where the wheels are!! if we interface with the MET the capability to append auxiliary identification tags then specific loads can now be tracked. Already there has been great interest shown in the tracking of hazardous goods, High value cargo's etc.

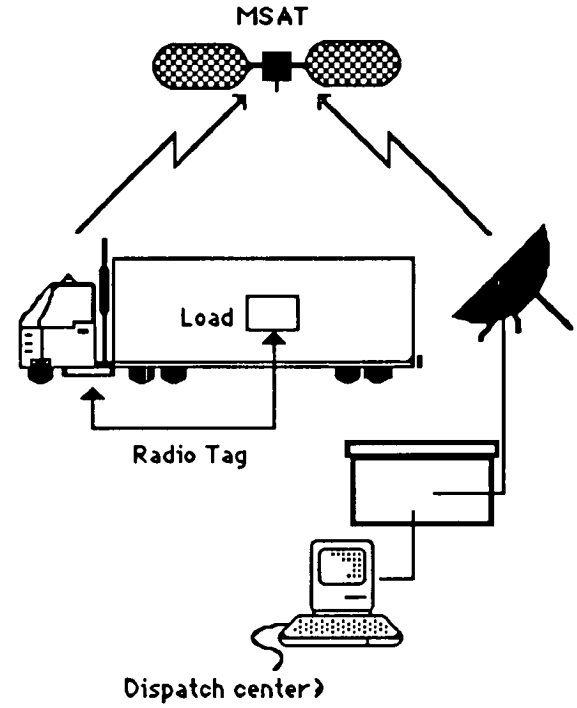

Fig 4
Secondary data acquisition

Extending this capability in a slightly modified form, will allow for the capability of continent wide tracking of hazardous or high value goods.

Remote Communications. Provision of quality communications into areas of the Canadian geography where a traditional Land-line solution is uneconomic economic is both possible and attractive. Since the MSAT service is distance independent communication to the more densely populated areas is very economic.

Facsimile Transmission. The explosion of Facsimile usage over the past five years has made the Group 3 Fax a "normal" office requirement. In keeping with this the MSAT Earth Terminals are being designed to accommodate this service.

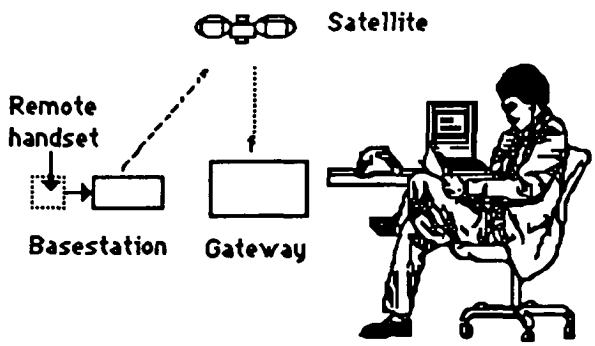

Fig 5
Remote Communications

MiniCell basestation. When we consider merging the capability of MSAT with the low power communications capability of a technology similar to CT-2, an economic solution is possible for a small community of interest. Such a solution has been suggested for the Resource industry where temporary communities can exist for short periods of time.

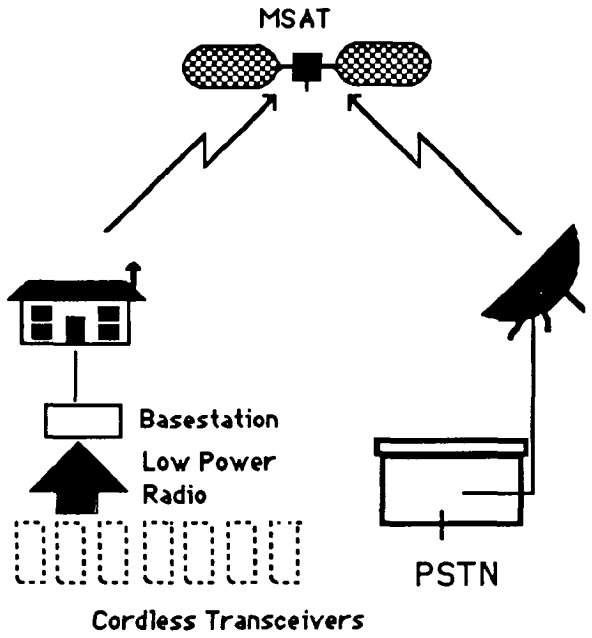

Fig 6
MSAT as a Community of interest base station

Emergency Services The transportability of the MSAT mobile Earth terminals is attracting a lot of interest in the Emergency measures organizations. With the TMI equipment temporary communication can be rapidly set up in the most inhospitable of areas.

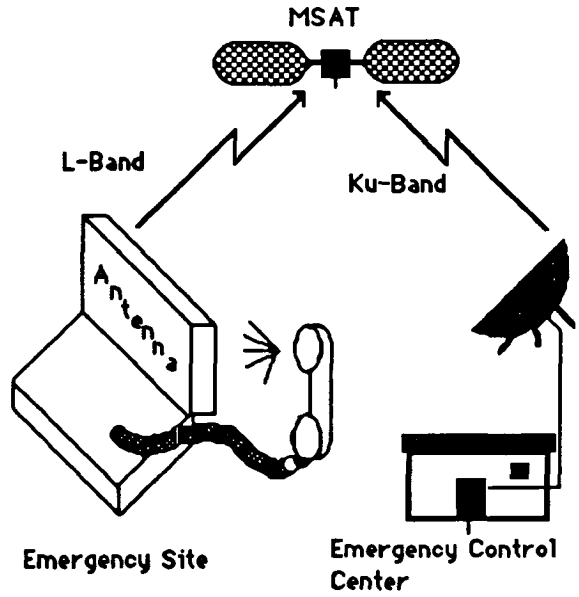

Fig 7
MSAT as an Emergency Communications facility

Conclusions

It is difficult in a short paper to address all of the capabilities of the system offered by TMI and AMSC. Hopefully this paper has indicated some of the interest being shown by the potential users and some of the solutions being innovativly applied using the MSAT facilities.