mobilesat® - A WORLD FIRST

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ABSTRACT/INTRODUCTION

Mobilesat will be the worlds's first truly mobile satellite telephony service to be offered in the land mobile market. Essentially a car phone which will be offered as a fixed service at a later date, mobilesat will bring circuit switched voice communications to remote and rural areas of Australia. This paper will outline where mobilesat fits as part of Optus, Australia's new telecommunications carrier, and briefly discuss the mobilesat system, its market and the future of mobile communications in Australia.

OPTUS COMMUNICATIONS - The new telecommunications carrier in Australia.

Optus Communications is the new telecommunications carrier in Australia. Our business mission is to be a customer-focused leader in long distance and mobile communications services.

The name, Optus, is derived from the latin verb 'optare', meaning 'to choose'. This new competitive environment will change forever the range and price of communications services available to Australia.

Optus is 51% owned by Australian shareholders, and 49% by the international telecommunications companies: Cable and Wireless PLC and Bell South Inc. Optus is building a dynamic and innovative service-based company using leading edge technology and talented people resources.

Optus has a policy of stimulating local technology development and communications equipment manufacturing through strategic alliances and joint ventures. This will see new export opportunities arise for Australia's information technology and telecommunications industries.

The Optus network has three main components - fixed, mobile and satellite based. Mobilesat will provide mobile and fixed telephone services to rural and remote areas, enabling Optus to provide complete national mobile coverage and total network facilities to the Australian telecommunications market.

mobilesat® - THE SYSTEM

The mobilesat range of services will be deployed using the L-band capacity on the Optus B series satellites. These satellites are HS601 satellites built by the Hughes Aircraft Company and launched by the China Great Wall Corporation. The first satellite was launched successfully last August. The second is due to be launched in March 1994.

The KU band payload on the Optus B satellites will provide for the continuity of service for the broadcasting industry, business data services and remote direct-to-home TV services. Each satellite carries a single 150 watt L-Band transponder. This gives coverage over the Australian continent and 200 kilometres out to sea.

The ground segments of the system will consist of two Network Management Stations (NMS)

located on either side of the continent giving complete redundancy; public access gateway stations to provide access to the public switched telephone network, and mobile terminals (telephones).
(see fig 1)

Generic Service Features

The mobilesat service will provide full duplex high quality voice with a robust digital architecture to give toll quality performance in the mobile environment. Connection to an an auxiliary interface unit will provide circuit-switched data at 2400 bps, facsimile, packet-switched messaging and interconnect to Global Positioning System (GPS) information for position reporting.

Suppliers

The mobilesat system has been totally designed and developed in Australia. NEC Australia are providing the telephone terminals and the hardware component of the Network Management Stations; Computer Sciences of Australia are providing the software component of the ground segment NMS. The factory acceptance process will continue into the second half of 1993.

Westinghouse Electric Corporation has signed a memorandum of understanding with Optus regarding supply of mobilesat terminals in 1994.

Prototype mobilesat terminals are also being supplied by NEC Australia. These will be trialled by selected companies from our target market later this year, ensuring a smooth transition to the launch of commercial service in December.

MARKET ANALYSIS

The Australian continent covers an area of 7.6 million square kilometres with a small population (17.5 million at June 1992). This population is concentrated in urban areas around the coastal fringe. Despite the population concentration in the urban areas the Australian export economy revolves in the main, around industries such as agriculture, mining, and tourism which are mostly located in the more remote regions of the country. Cellular services will provide coverage of up to 85% of the population but only 5% of the land area.This leaves many communities with little or no access to a reliable communications network. Mobilesat will fill this gap: it is targetted at providing services for the rural and remote areas of Australia, providing services similar to those enjoyed by their urban counterparts.

The system capacity in Australia for mobilesat telephones is expected to be about 50,000 users.This market has been segmented according to industry type and application into the following broad areas:

mining
utilities
emergency services
local government
state government
road transport
rail transport
the public market.

Market analysis forecasts show that the largest users of mobilesat will be the public sector, which includes small business in rural areas; together with Emergency Services and Public Utilities such as gas, water and electricity. This is closely followed by the Mining Industry.
(see fig 2)

Typical applications for mobilesat

Mining companies in Australia operate in a harsh environment. Field exploration crews operating in remote areas require a communications network which is reliable and secure. Market research indicates that mining companies would use mobilesat for control of operations, safety and simply to keep field crews in touch with head office or friends and family back home.

Data can be entered into a personal computer attached to a mobilesat terminal and transmitted to Head Office in a major town or city. Analysis time can be cut down considerably this way.

Safety is a major concern throughout the Australian Mining industry. In the event of accident or injury, an effective telecommunications system can mean the difference between life or death. Mobilesat has the added capability of call memory at the press of a button. This one-touch number can be programmed to call an emergency number or the mining base office.

Transport companies are also interested in using mobilesat to enhance efficiency of their operations. Mobilesat has been working with major transport organisations to develop the hardware and software components of the system and test them in the tough, long distance working conditions of the target markets.This involves an integration of the voice component of mobilesat with data and GPS. The integrated system is known as Transtracs. For example, in the latest trial two vehicles were equipped with a mobile satellite data terminal, GPS receiver and roof-top antenna to provide location and status reports to fleet head office.

At head office a map displayed text which included information such as vehicle ID and location, speed and direction. The text appeared in a 'window' against a map background showing the vehicle's geographic location.

Operational data and all ingoing and outgoing messages were automatically stored in a relational database which was then available for later reference to resolve delivery discrepancies or assist in report writing.

Connected to the mobilesat system to provide Australia-wide voice communications, Transtracs will support third party equipment in fleet vehicles such as electronic in-vehicle monitoring systems, driver input units and barcode readers, mobile fax and printers, and load monitoring for refrigerated or hazardous goods. This means that road, rail or coastal shipping fleet services will enjoy improved efficiency, timeliness and safety of their operations.

The most ubiquitous user of the mobilesat service, however, will be the average person who needs a phone on the road, for either pleasure or business. These customers will use mobilesat in the way their city cousins use cellular car phones, for communication convenience. Adding a fax or data port will make the mobile office achievable.

Pricing

Approximate pricing expectations for mobilesat are as follows: (prices in Australian dollars unless otherwise specified.)

Mobilesat telephony terminal	$7000.00
Auxiliary Interface Unit	$ 800.00
One time connection fee	$ 100.00
Monthly system access fee	$ 30.00
Voice charge per minute (distance independent)	$ 1.50
mobile to mobile calls per minute	$ 2.40
messaging service per month	$ 100.00

These figures compare to $1000 for a cellular telephone, $3000 for a hand-held cellular telephone, $3000-5000 for a HF radio and cellular call charges of $40.00 per month and long distance cellular charges at 60c per minute.

Prices for mobilesat equipment and airtime are also considerably less than our satellite competitors. For example, A$35-40,000 for an Inmarsat M terminal with airtime at US$5.40 per minute.

Competitive threats

Mobilesat enjoys the distinct advantages of satellite delivered systems over terrestrial two-way communications - voice quality, reliablity and coverage area. No repeater towers are necessary for coverage, and the cost of communicating over 500 or 5,000 kilometres is the same. Mobilesat also competes extremely

favourably on a cost basis with other proposed satellite systems and has an added advantage - the true mobility of an in-vehicle telephone. These superior aspects of the service position mobilesat as a world leader in land mobile communications from an economic and technological viewpoint.

THE FUTURE

Mobilesat, the Australian designed and soon to be implemented service, will be the first domestic mobile satellite service in the Pacific, as well as the world. This will provide to Australians a service capability currently not available and will provide rural and remote Australia with the advantages that cellular services have provided to the urban areas. Optus, via the mobilesat service and its other terrestrial and satellite infrastructure, looks forward to providing a level of customer service and total network coverage that will position it as the dominant telecommunications carrier in the Pacific region.

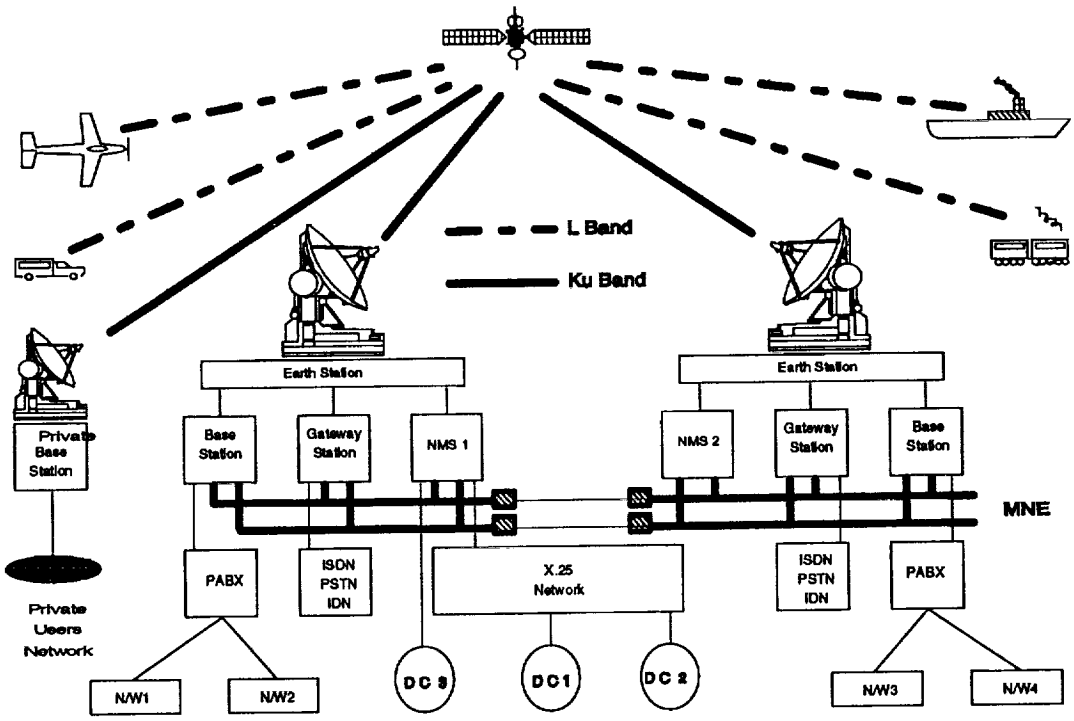

Figure 1
mobilesat® configuration

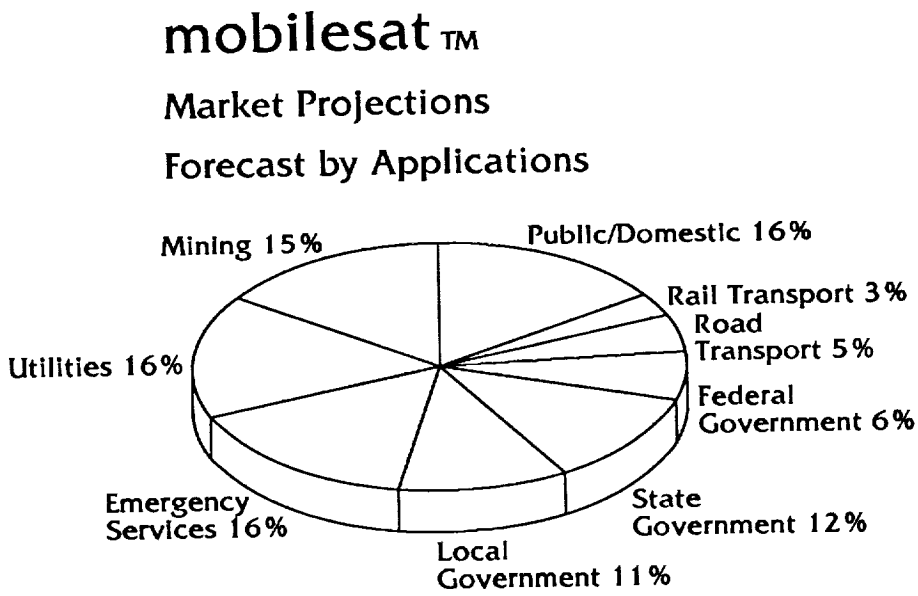

Figure 2
mobilesat® market projections