for maritime safety services in the lower L-band. 47 C.F.R. Section 2.106 footnotes US308, US315. "Priority" means that if a GMDSS or AMS(R)S system operating on MSV's satellite(s) needs additional spectrum, MSV will relinquish that spectrum to it. "Preemption" is required when the requested MSV spectrum is occupied. In that case, MSV will terminate active channels to make spectrum available. The Commission has defined the system characteristics required to support priority and preemptive access in Motient's authorizations.[6] MSV's understanding of these requirements is that if a GMDSS or AMS(R)S system operating on MSV's satellite(s) needs additional spectrum for safety or emergency communications, MSV will relinquish that spectrum to it, including preempting channels currently in use for lower priority communications, if required, to make spectrum available.

If, for example, MSV's system is based on GSM protocol, it will possess inherent features for priority handling of communications, in both circuit- and packet-switched modes. (Although the following discussion assumes that GSM protocol is used, CDMA and other protocols have similar capabilities). A most effective and useful preemption feature of GSM makes use of the concept of "access class." The feature can be used to forbid entire populations of mobile terminals from accessing the system through an indication on the Broadcast Control Channel (BCCH). In order to achieve this, the GSM specification defines a methodology whereby subscribers are split into 10 balanced sub-groups, through a random allocation controlled by the system operator. The access class to which a given subscriber belongs is stored in the Subscriber Identity Module (SIM) and is therefore available to the subscriber's mobile terminal. Under normal operating conditions, all classes are allowed access to the system. When

---

6 *See, e.g.*, Application of AMSC Subsidiary Corporation for a Blanket License to Construct and Operate up to 200,000 L-band Mobile Earth Stations, *Order and*

Footnote continued on next page

traffic must be reduced however, the cell controller (BSC) can decide to block 1, 2 or any number of access classes, reducing statistically the amount of traffic by 10%, 20%, etc. Mobile terminals belonging to the forbidden classes refrain from accessing the network, except in specific cases (e.g., emergency calls, which are controlled by a specific indicator). In order to be fair, if terminals must be forbidden from accessing the system for a long time, the BSC can change the set of authorized classes on a regular rotating basis. To avoid blocking special categories of users, GSM defines five additional classes: Class "11" is left open to the system operator; class "12" is for security services; class "13" is for public utilities; class "14" is for emergency services; and class "15" is for system operator staff. System access for these additional five "privileged" classes is also controlled through indicators broadcast on the BCCH. The "privileged" subscribers also belong to one of the 10 standard classes, and may access the network when at least one of their classes is allowed. MSV will utilize the large number of terminal classes that the GSM specification/protocol is inherently capable of supporting, and will assign the appropriate high priority levels to aeronautical and maritime safety services. Having 10 standard classes as in GSM is not necessary. A system can perform substantially the same functions with only seven or even five. Thus, in the MSV system, perhaps only five out of the ten "non-privileged" access class groups will be kept for the general (commercial) user population, freeing the remaining five to be dedicated to priority AMS(R)S/GMDSS safety communications.

Besides the ability to deny system access to selected groups of commercial users in order to suppress commercial traffic and thus make additional spectrum available for safety services,

---

Footnote continued from previous page

Authorization, File No. 2823-DSE-P/L-93, ¶¶ 12, 18 (1993).

the MSV system will also be capable of preempting active channels. In the MSV system, preemption will be automatic and quick. In accordance with GSM protocol, a Fast Associated Control Channel (FACCH) message can be used to terminate a given active channel and assign the resources of that channel to a higher priority user. FACCH messages in GSM are transmitted as in-band signaling and can thus occur once every frame. In the satellite mode, the GSM protocol contemplated by MSV will have a frame duration of approximately 18 msec (18×10^{-3} seconds). Thus, when it becomes necessary to preempt one or more channels, such preemption will occur automatically and immediately. Following processing of the received priority request(s), the satellite gateway will automatically transmit the required FACCH message(s) to the selected active terminal(s) to be preempted. The terminal(s) will receive the FACCH message(s), will acknowledge receipt to the gateway, and will cease further transmissions. Given the round trip propagation delay associated with the geostationary satellite orbit, this process will add approximately one half of a second to the processing time, at the end of which the satellite gateway will allocate the preempted resource(s) to the AMS(R)S or GMDSS services. Depending on the volume of preempted resources, the gateway may also decide to forbid certain populations of commercial terminal users (on a rotating basis as discussed previously) from even attempting to access the system.[7] This can be viewed as Random Access Channel (RACH) preemption for a number of classes of commercial users (on a rotating basis) so that unnecessary loading on the RACH channel(s) is avoided.

The resources that are preempted from MSV's satellite operations will also be subject to preemption from terrestrial use. This can be readily implemented to occur automatically in

---

[7] The gateway may decide to do this because under certain extreme situations it may be more palatable for an end user to be told that the system is unavailable than to receive a

Footnote continued on next page

response to preemption of satellite operations and at substantially the same time as the satellite operations are preempted. MSV will be able to simultaneously preempt corresponding satellite and terrestrial resources because the centralized common control of space and ground assets enables the necessary real-time coordination for MSV.

Footnote continued from previous page

busy signal on every call attempt.

Technical Certification

I, Dr. Peter D. Karabinis, Chief Technical Officer of Mobile Satellite Ventures LLC, certify under penalty of perjury that:

I am the technically qualified person with overall responsibility for the preparation of the technical information contained in the above "Technical Analysis." The information contained in this document is true and correct to the best of my belief.

Dr. Peter D. Karabinis

Dated: October 22, 2001

Exhibit A

MSV Response Matrix

¶ of NPRM	Issue	MSV's Position	See Page(s)
	I. Introduction		
¶ 3	How can the FCC permit more flexible use of MSS spectrum: (i) By allowing MSS operators to integrate terrestrial operations in their networks or (ii) opening up the 2 GHz and L-bands for any operator to provide a terrestrial service either in conjunction with the MSS provider or as an alternative mobile service?	By allowing MSS operators to integrate terrestrial operations in their networks.	Section I, pages 5-22; Section V, 33-36; Technical App., pages 2-5
	II. Discussion **B. Need for Flexibility by MSS Operators**		
¶ 25	Are terrestrial operations (i) important to the commercial viability of MSS systems; (ii) important to the Commission's goal of bringing access to advanced communications services to rural and underserved areas of the country; (iii) consistent with the FCC's general policy goal of granting licensees technical, operational, and service flexibility? Will terrestrial operations (i) increase demand for service and (ii) lead to use of the spectrum that is more efficient from a technical and economic point of view?	Yes.	Sections I.A, I.B, I.C, I.D; pages 5-22; Exhibits B, C, D
¶ 26	How severe are the signal problems that underlie the ICO and Motient proposals?	MSS reception difficulties are severe in urban and indoor environments.	Section I.B; pages 11-12 Tech. App., pages 1-2
¶ 26	What are the comparative abilities of terrestrial CMRS systems (both existing and planned) and hybrid MSS systems to serve rural and unserved areas?	Terrestrial systems will never be able to cover the same geographic area as efficiently and economically as satellite systems.	Section I.A; pages 5-10
¶ 27	Could MSS operators rely on commercial arrangements with terrestrial CMRS service providers to extend coverage to urban areas and to penetrate buildings?	No, such arrangements have proven to be unworkable and not spectrum efficient.	Section I.B; pages 14-16
¶ 28	Should the FCC view the ICO and Motient proposals as indicating that too much spectrum has been allocated for MSS? Would using this spectrum for terrestrial service in urban areas diminish spectrum capacity for satellite service to rural and underserved areas?	No.	Section V; page 33 n.55 Section I.C; pages 16-17

¶ of NPRM	Issue	MSV's Position	See Page(s)
¶ 28	Would it be in the public interest to adopt a segmentation plan wherein separated bands for terrestrial services would be identified and available for licensing to a larger group of parties, such as through an auction process?	No. Such an approach would cause debilitating interference to L-band MSS operators or severely reduce their satellite capacity, potentially breach international coordination agreements, jeopardize safety services, and slow the deployment of service.	Section V; pages 33-36 Technical Appendix; pages 2-5
	C. Proposals to Provide Flexibility to MSS Operators in the 2 GHz and L-Bands		
¶ 30	Comments on FCC's proposed definition of "ancillary."	MSV supports the proposed definition.	Section II.A; page 23
¶ 37	Rather than allowing MSS operators to reuse MSS spectrum on an ancillary basis for terrestrial operations, should the FCC make some MSS spectrum available for *any* entity to provide terrestrial service in conjunction with MSS systems or as an alternative mobile service?	No. Such an approach would cause debilitating interference to L-band MSS operators or severely reduce their satellite capacity, potentially breach international coordination agreements, jeopardize safety services, and slow the deployment of service.	Section V; pages 33-36
¶ 39	If the FCC were to permit terrestrial operation in the 2 GHz and L-band, but limit such authority to only MSS operators that provide service on an ancillary basis, would the FCC's obligation to use auctions under 309(j) be implicated? Is the ORBIT Act implicated?	No, because there would be no mutual exclusivity.	Section V; pages 35-36

¶ of NPRM	Issue	MSV's Position	See Page(s)
¶ 40	Should a fee be imposed on MSS providers offering ancillary terrestrial service similar to the fee imposed on broadcasters who use DTV spectrum for ancillary services?	No, it would not be sound policy nor would it be consistent with precedent.	Section IV.D; pages 30-31
	D. Specific Proposals for Permitting Ancillary Terrestrial Services in the 2 GHz and L-Bands **1. Conditions on the Use of Terrestrial Components**		
¶ 41	Would the terrestrial services, as envisioned in the ICO and Motient proposals, be truly ancillary to satellite service offerings?	Yes.	Section II; pages 23-26
¶ 41	Would the terrestrial services envisioned in the ICO and Motient proposals be consistent with Commission precedent permitting ancillary service offerings?	Yes.	Section I.C; pages 18-21
¶ 46	Is it accurate that the proposals to operate terrestrially in the MSS-bands will not require a single kHz of spectrum not allocated to MSS and would allow for use of frequencies in urban areas that would otherwise lie fallow?	Yes.	Section I.C; pages 16-17
¶¶ 41, 45	What conditions might be imposed that would ensure terrestrial operations remain ancillary but also comport with the Commission's general goals of encouraging flexibility of spectrum usage and service to rural and underserved areas? Would requiring that MSS operators integrate the terrestrial and satellite operations of their network through one central data switch ensure that the terrestrial component is ancillary to the satellite component?	MSS operators can provide data to the Commission demonstrating that terrestrial operations are ancillary.	Section II; page 23-26; Tech. App. 5-6
¶¶ 32, 42	With respect to L-band MSS operators, should commercial operation of terrestrial facilities not be permitted until the MSS system can provide space segment service covering 100 percent of the United States that is available 100 percent of the time?	Commercial operations of terrestrial facilities should not be permitted until MSS system provides full-CONUS coverage.	Section II.B; pages 23-24

¶ of NPRM	Issue	MSV's Position	See Page(s)
¶¶ 32, 45	Should the FCC consider revoking an MSS operator's authorization to use terrestrial facilities if its coverage or service availability falls below 100 percent due to a failed satellite and the MSS operator does not replace the satellite within a reasonable period of time?	Only if the MSS operator does not replace the satellite within 2 years.	Section II.C; pages 24-25
¶ 45	Should MSS operators be allowed to build out and test their terrestrial facilities in advance of fulfilling the FCC's coverage conditions?	Yes, because it will ensure that the terrestrial system will be in place when satellite coverage requirements are satisfied.	Section IV.B; pages 29-30
¶¶ 43,46	On what frequencies should an L-band MSS provider be permitted to operate ancillary terrestrial facilities? Will terrestrial operations affect current and future international coordination agreements?	Terrestrial operations should be on L-band frequencies MSS provider has coordinated. Terrestrial operations should not affect coordination.	Section III.A; page 26 Section V; pages 33-34
¶ 49	Could parties other than MSS operators participate in or be given notice of annual L-band coordination negotiations?	No.	Section III.A; page 26 Section V; pages 33-34
	2. Licensing Requirements		
¶ 50	Should the FCC authorize upon request, the use of terrestrial facilities by modifying a U.S. licensee's space station license to authorize explicitly the provision of service by means of terrestrial facilities?	Yes. MSV has already made such a request.	Section IV.A; pages 28-29
¶ 51	Is it necessary to require that an MSS operator obtain an earth station license before offering terrestrial services?	Yes.	Section IV.C; page 30
¶ 52	Is individual licensing and coordination of ancillary terrestrial base stations needed?	No, provided the Commission adopts technical rules for the protection of adjacent band and co-channel users.	Section IV.A; page 29

¶ of NPRM	Issue	MSV's Position	See Page(s)
¶ 52	Should terrestrial facilities be licensed for the U.S. coverage of the MSS space segment or a smaller area?	U.S. coverage of the MSS space segment	Section IV.A; pages 28-29
¶ 52	Should we permit construction of terrestrial facilities prior to obtaining an earth station license, at the provider's own risk?	Yes, because it will ensure that the terrestrial system will be in place when satellite coverage requirements are satisfied.	Section IV.B; pages 30
¶ 53	Should handsets designed to operate using MSS ancillary terrestrial facilities require equipment authorization?	No, provided the MSS operator must obtain an earth station license for its mobile terminals.	Section IV.C; page 30
	3. Technical Issues		
¶ 55	Are the limits contained in 47 C.F.R. § 24.238 the appropriate limits for the terrestrial equipment of L-band MSS terrestrial services?	Yes. It is also a standard with which equipment manufacturers are familiar.	Section III.B; page 26
¶ 56	Are 47 C.F.R. §§ 24.232 and 24.237 proper to apply to assist with coordination and deployment of MSS terrestrial systems?	Yes.	Section III.C; page 27
¶ 57	Should the frequency stability rules for MSS terrestrial equipment parallel those of similar terrestrial communication systems, such as those contained in 47 C.F.R. § 24.235?	Yes.	Sections III.D; page 27
¶ 58	Are there any restrictions, other than those on using handheld electronic devices onboard commercial aircraft, that should be applied to the operation of handsets used with MSS terrestrial facilities?	No.	Section III.E; page 28
¶ 67	Regarding the L-band proposal, can the proposed terrestrial operations implement the conditions for priority and preemptive access for safety communications with real-time preemptive capability for related safety communications within an integrated satellite and terrestrial system?	Yes.	Section III.F; page 28 Section V; pages 34-35; Technical Appendix; pages 6-9

¶ of NPRM	Issue	MSV's Position	See Page(s)
¶ 68	Regarding the L-band proposal, are out-of-band emissions limits similar to those in Section 25.231(b) on the terrestrial base station operations sufficient to protect GPS?	Yes.	Section III.B; pages 26-27; Exhibit E
	4. Modifications to the Table of Allocations		
¶ 70	With respect to the L-band, should the FCC amend the U.S. Table of Allocations contained in Section 2.106 to add a footnote to permit MSS operators operating in these bands to also operate integrated terrestrial components in conjunction with their provision of MSS?	Yes	Section IV.E; page 32
¶ 71	Is it necessary to reallocate the bands at issue to terrestrial services?	No, because MSS will remain primary.	Section IV.E; page 32
	6. Proposed Amendments to Service Rules		
¶ 77	Should the FCC require applicants for 2 GHz or L-band MSS authorizations to include the complete radio frequency plan for any terrestrial equipment that may be proposed for incorporation into their network?	No, the technical rules established in this proceeding should be sufficient to address any interference problems.	Section IV.A; pages 28-29
¶ 77	Should the FCC add a rule section that prohibits the commercial operation of terrestrial facilities of a 2 GHz or L-band MSS network unless: (i) the terrestrial equipment is operating in the same spectrum segment as the satellite system; (ii) at least one satellite is visible above the horizon at an elevation angle of at least five degrees at all times within the required geographic areas; and (iii) the satellite system provides mobile satellite service on a continuous basis throughout the 50 U.S. states, Puerto Rico, and the U.S. Virgin Islands, with the exception that a GSO L-band operator that can demonstrate that it cannot meet these coverage requirements may commercially operate its terrestrial component if it is providing continuous mobile satellite service in all geographic areas it is capable of serving?	Yes, with some modifications.	Section IV.A; pages 28-29

¶ of NPRM	Issue	MSV's Position	See Page(s)
¶ 77	Should the FCC add a rule section that allows any applicant authorized to construct and launch a 2 GHz or L-band MSS system to construct and operate terrestrial facilities in the applicant's selected assignment band, in the case of 2 GHz MSS, or in the spectrum that has been coordinated, in the case of L-band MSS?	Yes.	Section III.A; page 26

Exhibit B

POLICE DEPARTMENT

Motient
Mr. Jeffrey M. Corcoran
352 Curtiss Street
Southington, Connecticut 06489-1706

Dear Mr. Corcoran,

"When I find myself fading, I close my eyes and realize my friends are my energy." Your generosity during this tragic time has comforted my men as they set about the grueling task of finding their fallen brethren. You offered assistance in our time of need. Your donation of the satellite phones to TARU provided a much needed means to communicate when our normal systems took a direct hit. In preparing for possible future attacks these phones will be included as part of our emergency response protocol.

"It's not whether you get knocked down. It's whether you get back up." It is the sworn duty of both the FDNY and NYPD to protect its citizens, and we will continue to uphold this social contract. We have been knocked down but we have responded with renewed resolve to ensure that those who are guilty are tracked down and that the safety of the people of New York is ensured.

These words are insufficient to express our feelings towards the generous spirit of New Yorkers and the United States, but on behalf of the NYPD, TARU and myself I wish to thank you.

Sincerely yours,

Stephen G. McAllister
Captain, NYPD
Commanding Officer, TARU

Exhibit C

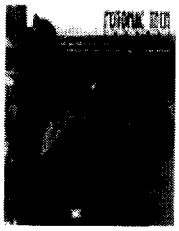
Monday
October 22

PIPER MARBURY RUDNICK & WOLFE LLP

POTOMAC TECH JOURNAL

The region's technology newsweekly

Subscribe to our new daily e-mail news service! Go!
Subscribe to the region's technology newsweekly! Go!



AVAILABLE NOW, the Region's most comprehensive guide to Technology Companies!

OUR CURRENT ISSUE

Internet
Information Technology
Software
Telecommunications
Med Tech
Community
Education
Government
Startup
Potomac Access...
Venture Capital
Work Force
News Wrap
Tech Talk

Real estate & architecture

Tech firms step into the breach after terrorist acts

9/17/2001

By Taylor Lincoln

Several Potomac area technology companies were called into service following last week's terrorist attacks, while others saw opportunities for technology to prevent future tragedies.

Shortly after four commercial airliners were hijacked Tuesday morning and crashed into the World Trade Center, the Pentagon and a Pennsylvania field, the American Red Cross and the Federal Emergency Management Agency asked Reston, Va.-based **Motient** Corp. to re-configure talk groups for their satellite telephones, said Walt Purnell, **Motient**'s chief executive officer. Talk groups allow people to communicate in walkie-talkie fashion on **Motient**'s network.

The Red Cross and FEMA — which are using hundreds of **Motient**'s satellite telephones to coordinate rescue efforts in New York — have been customers of the company for several years, Purnell said, adding that the phones are particularly effective in disasters because they are impervious to weather and telecommunications outages.

On Thursday, the firm added another customer when the New York Police Department requested 10 satellite telephones.

Motient is not charging the Red Cross for airtime, and hasn't considered whether others will be billed.

"We shipped [the telephones] out," Purnell said. "We'll worry about that later."

Motient's wireless e-mail network, which transmits messages sent from portable RIM devices using BlackBerry and eLink software, also played a key role Tuesday.

The network ordinarily caters to financial services companies whose

employees use it to relay stock quote information. On Tuesday, the e-mail network filled in when wireless telephone networks buckled.

"I know that we had hundreds of BlackBerry and eLink devices in [the World Trade Center]. What I have heard is a lot of people sending messages to their loved ones telling them they were OK," Purnell said, adding that the network was unaffected by the increased demand.

Several wireless telephone companies, including Reston-based Nextel Communications Inc. and Verizon Wireless, a New Jersey-based company with a large presence in Washington, D.C., lined up to offer cellular telephones and free airtime to rescue workers.

Nextel said it had loaned 2,000 mobile telephones with unlimited service and two-way radio capabilities to government agencies and emergency service providers.

The company said it planned, in conjunction with Motorola Inc., to furnish 10,000 more telephones to assist with the relief efforts.

Verizon Wireless, whose network suffered massive damage in the collapse of the twin towers at the World Trade Center, said it offered 5,000 mobile telephones to emergency authorities, at least 800 of which were in use by late in the week.

According to spokesman John Johnson, within 48 hours of the disaster, the firm also had resuscitated its lower New York service. Nine of 10 cellular sites whose wire connections were severed by the collapse were back operating by Thursday, Johnson said. Verizon also brought in temporary cellular towers on trucks and trailers to increase capacity.

Fairfax, Va.-based Flight Explorer, a subsidiary of Alexandria, Va.-based Flight Dimensions International Inc., which monitors and records flight paths, provided a communications service of its own in the hours and days following the tragedy.

The firm released to the media animated illustrations of the routes of the four doomed flights, showing them making sudden mid-course adjustments. The depictions were requested by at least a dozen news organizations, including all of the major networks, said Jeff Krawczyk, Flight Explorer's chief operating officer. (See related story, page 8.)

The hijackings have brought widespread calls for vastly heightened airport and airline security. At least two area companies offer technology they say could improve security or assist airlines in efficiently adhering to higher standards.

EyeTicket Corp., based in McLean, Va., makes products that identify people through iris recognition technology.

"We can provide a large amount of security in that we can assure the identity of somebody," said Catherine Kaliniak, spokeswoman

for EyeTicket. "If we had our systems in operation across the world, you couldn't pretend to be somebody else."

Kaliniak said the iris recognition technology could help expedite more stringent identification standards surrounding flight and baggage check-in procedures.

EyeTicket's products, which use patented technology that the firm licenses from New Jersey-based Iridian Technologies, are already in use for workers at Charlotte/Douglas International Airport in Charlotte, N.C., and soon will be used on an optional basis by travelers at London's Heathrow Airport.

BioNetrix Systems Corp., of Vienna, Va., also saw ways its technology could be used at airports. The company produces software for storing and authenticating data furnished by an assortment of identification devices, including digital fingerprint readers and iris recognition equipment.

"The first thing that occurred to me when we saw the horror on television is the relevance of our technology in airport security," said Santosh Chitakki, BioNetrix's vice president of marketing.

"How can you make it as secure as possible without affecting the convenience of the travelers?" asked Chitakki, whose company had not previously considered applying its technology in airports. "That's a way we think we could possibly come in and help."

Other firms drew lessons from the performance of the Internet and expressed concern about the potential vulnerability of the Internet if

there were to be other terrorism attacks.

Noting the difficulty of logging onto news-oriented Web sites Tuesday, ServerVault Chief Executive Officer Patrick Sweeney called for a "National 911 emergency information resource portal" on the Web. (See editorial, page 17.)

"It is critical that civilians have an online resource where they can not only find information and direction in a time of crisis, but also provide eyewitness updates, information and situation reports," said Sweeney, whose firm provides Web hosting with an emphasis on security.

"The government has the capacity to create something that is as close to 100 percent as you can possibly imagine," he said.

But the connectivity that the Internet offers will leave us vulnerable until its entrances and exits are better protected, Sweeney warned.

Dean Rich, the chief executive officer of Cyber Security Inc., a managed security firm in Chantilly, Va., struck a similar theme.

"We have yet to see our cyber Pearl Harbor," he said. "What will be the effects of information being taken down?"

EMAIL ARTICLE TO A FRIEND... >

Home | Subscriptions| Contact Us | Advertising
All Rights Reserved. Potomac Tech Journal 2000
Privacy Policy | User Agreement

Want a FREE subscription to Potomac Tech Journal ?
Click here to subscribe!

Exhibit D

Gilbert & Associates
P.O. Box 7332 • Arlington, VA 22207 • Tel: 703-241-2592 • Fax: 703-241-0689

October 18, 2001

Statement by Rear Admiral M. Edward Gilbert, US Coast Guard, Retired.

I served more than 35 years in the US Coast Guard in operational and telecommunications assignments. Presently, I am a consultant to MSV.

During my Coast Guard career I led many US Delegations participating in international telecommunications meetings. From 1981 to 1985, when the International Maritime Organization (IMO) was establishing the foundation for the Global Maritime Distress and Safety System (GMDSS), I was the leader of the US Delegation to the IMO's Communications Subcommittee. I was the senior technical advisor for the US Delegation to the 1983 World Radio Conference that provided the enabling telecommunications framework for the GMDSS.

Much of my career has been devoted to improving maritime safety through the effective use of telecommunications. Since retirement in 1993, I have been President of Gilbert & Associates, Inc. providing consulting support in the fields of telecommunications, coastal zone management, crisis leadership, and technical support for emergency organizations plus state and local governments. I served on the Public Safety Wireless Advisory Committee (PSWAC), the GMDSS Implementation Task Force, and the Emergency Information Partnership Committee formed by the Federal Emergency Management Agency (FEMA).

1. MSV's next-generation satellite system will provide an exceptionally useful capability for mariners operating offshore near the United States and in the many inland rivers and lakes. The 300-400 miles offshore coverage to be provided with spot beams will allow use of the MSV satellite system for the more than 11 million boats less than 65 feet in length presently in use. Well over 95% of all search and rescue cases occur in this coverage region. MSV's next-generation system will allow access via small handheld terminals from these boats. Current geostationary systems require user terminals that are too large for these types of boats to use effectively and economically. For the first time, boaters will have access to affordable terminals suitable for their use.
2. Commercial fishing is an exceptionally dangerous occupation partially because of the lack of reliable telecommunications. MSV's proposed system will cover the vast majority of all U.S. fishing grounds, thereby bringing users reliable and affordable telecommunications for safety and commercial uses. In addition, reception of vital weather and navigational warning information, public correspondence, and contact with the Coast Guard in emergencies will be enabled by the proposed system.

3. Most of the US Exclusive Economic Zone (EEZ), the maritime areas within 200 miles of the US Coastline, will be covered by the proposed system. This will allow commercial organizations operating in the EEZ and regulatory agencies to have effective and affordable telecommunications support.
4. Effective telecommunications will be provided to organizations responding to natural disasters such as, earthquakes, hurricanes, and man made incidents such as oil spills. Often these disasters, such as earthquakes, disrupt terrestrial wireline and wireless telecommunications systems. MSV's satellites will be located 22,000 miles above the earth unaffected by these disruptions. Reliable communications for emergency response organizations will be assured.
5. The Public Safety Wireless Advisory Committee identified *nationwide interoperability* as a key need for Federal, state and local governments and other emergency response organizations. The Public Safety Wireless Network Organization is working to improve wireless access for many different agencies. MSV's proposed system will provide a strong foundation for an interoperable, nationwide wireless system available to all of these users for normal and emergency communications.
6. State and local governments are implementing terrestrial programs to satisfy telecommunications needs. Much of the expense comes from providing rural coverage. Many of these rural locations will never have terrestrial coverage by commercial or government systems. The proposed systems will offer an inexpensive and effective way to serve remote areas and offer the potential for substantially lowering the cost and complexity for implementing statewide systems.

In summary, the system proposed by MSV offers exciting new capabilities to a large number of maritime and public safety organizations

Rear Admiral M. Edward Gilbert,
US Coast Guard, Retired

Exhibit E

Uppgjord (även faktaansvarig om annan) - *Prepared (also subject responsible if other)*		Nr - *No.*		
EUS/P Anders Otto				
Dokansv/Godk - *Doc respons/Approved*	Kontr - *Checked*	Datum - *Date*	Rev	File
		11 April 2001	A	

BTS TRANSMIT PERFORMANCE FOR GSM 1500 MHZ (1525-1559)

Based on the following requirement, a simulation of the expected performance of the BTS for this area and some of the possible implementations are described in this document.

1 REQUIREMENTS

Req 1: -70 dBW/MHz EIRP from 1559 - 1606 MHz.

Req 2: -80 dBW discrete spurious, measured in a 1 kHz bandwidth.

Req 1: -70 dBW/MHz EIRP from 1559 - 1606 MHz.
The calculations of the performance of the BTS are made with the following assumptions; output power of 10 dBW and a guardband of 1.2 MHz. In order to meet the requirement of -70 dBW/MHz EIRP for 1559 to 1606 MHz, a TXBP filter is required to suppress the out of band emissions from the BTS. The TXBP filter needs to compensate not only for the difference but also the total antenna chain gain with the assumed feeder loss of 3 dB and antenna gain of 16 dBi. The TXBP filter therefore needs to attenuate an average of 42.3 dB over 1 MHz (1559-1560). (for calculations see section 3).

Req 2: -80 dBW discrete spurious, measured in a 1 kHz bandwidth.
From the calculations discussed under Req 1 with 1.2 MHz of guardband and 10 dBW of outputpower. The meet the requirement, the TXBF needs to attenuate a minimum of 25 dB in the range of 1559-1606 MHz. (for calculations see section 3).

2 GENERATED OUT OF BAND EMISSIONS