UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION

RADIO STATION AUTHORIZATION

CALL SIGN: E900081
FILE NO.: 179-DSE-MP/L-97

NAME: AMSC SUBSIDIARY CORPORATION

MODIFIED CONSTRUCTION PERMIT AND LICENSE

DATE OF GRANT: NOVEMBER 22, 1996
COMMON CARRIER EXPIRATION DATE: JANUARY 21, 2002
NATURE OF SERVICE: DOMESTIC FIXED SATELLITE SERVICE
CLASS OF STATION: MOBILE EARTH STATION

LATITUDE LONGITUDE
LOCATION OF STATION:
STATION ADDRESS: 30,000 Mobile Earth Stations
((30,000 units) County),

SUBJECT TO THE PROVISIONS OF THE COMMUNICATIONS ACT OF 1934, THE COMMUNICATIONS SATELLITE ACT OF 1962, SUBSEQUENT ACTS AND TREATIES, AND ALL PRESENT AND FUTURE REGULATIONS MADE BY THIS COMMISSION, AND FURTHER SUBJECT TO THE CONDITIONS AND REQUIREMENTS SET FORTH IN THIS PERMIT AND LICENSE, THE GRANTEE IS AUTHORIZED TO CONSTRUCT, USE AND OPERATE THE RADIO FACILITIES DESCRIBED BELOW FOR RADIO COMMUNICATIONS FOR THE TERM BEGINNING JANUARY 21, 1992 (3 A.M. EASTERN STANDARD TIME) AND ENDING JANUARY 21, 2002 (3 A.M. EASTERN STANDARD TIME).
THE REQUIRED DATE OF COMPLETION OF CONSTRUCTION IS JANUARY 21, 1997. GRANTEE MUST FILE WITH THE COMMISSION A CERTIFICATION UPON COMPLETION OF CONSTRUCTION.

1. PARTICULARS OF OPERATIONS

	FREQUENCIES (MHz) AND POLARIZATION	EMISSION	EIRP (dBW)	EIRP DENSITY (dBW/ 4kHz)	ASSOCIATED ANTENNA(S)	SPECIAL PROVISIONS (REFER TO FCC FORM 488-A)
1.	1530.000- 1559.000 L,R	1K20G1D	- - -	- - -		
2.	1530.000- 1559.000 L,R	2K40G1D	- - -	- - -		
3.	1530.000- 1559.000 L,R	4K80G1D	- - -	- - -		
4.	1530.000- 1559.000 L,R	9K60G1D	- - -	- - -		
5.	1626.500- 1660.500 L,R	1K20G1D	14.00	14.00		
6.	1626.500- 1660.500 L,R	2K40G1D	17.00	17.00		
7.	1626.500- 1660.500 L,R	4K80G1D	20.00	20.00		
8.	1626.500- 1660.500 L,R	9K60G1D	23.00	23.00		

2. FREQUENCY COORDINATION LIMITS

	Frequency Limits (MHz)	Satellite Arc (Deg. Long.) East Limit	Satellite Arc (Deg. Long.) West Limit	Elevation (Degrees) East Lim.	Elevation (Degrees) West Lim.	Azimuth (Degrees) East Limit	Azimuth (Degrees) West Limit	Max. EIRP Density to Horizion (dBW/4kHz)	Associated Antenna(s)
1.	1530.000- 1559.000	15.0W	183.5W	-		-			
2.	1626.500- 1660.500	15.0W	183.5W	-		-			

FEDERAL COMMUNICATIONS COMMISSION
INTERNATIONAL BUREAU

ANTENNA DATA REPORT

SEND TO: ANTENNA SURVEY BRANCH
DATE FILED: 11/06/1996

RETURN TO: SATELLITE ENGINEERING BRANCH
ATTN: DMG

APPLICANT: AMSC SUBSIDIARY CORPORATION

ANALYSIS RECORD

FILE NUMBER: 179-DSE-MP/L -97 CALL SIGN: E900081
SITE-ID:

SITE LOCATION ADDR: 30,000 Mobile Earth Stations
COUNTY: (30,000 units)
CITY/STATE: ,

RECEIVED:

RETURNED:

HELD FOR FAA ACTION:

COORDINATES: ' '' LAT ' '' LONG

FAA ACTION/FILE:

SITE ELEVATION: FEET

COMPLETED:

MAXIMUM ANTENNA HEIGHT: 1st FEET (AGL)
2nd FEET (AMSL)

REVIEWED:

ACTION:

( ) NEW EARTH STATION ANTENNA
( ) MODIFICATION OF EXISTING EARTH STATION ANTENNA

TO BE COMPLETED BY ANTENNA SURVEY BRANCH

17.7 NOTIFICATION CRITERIA (FILE NOTICE OF PROPOSED CONSTRUCTION WITH FAA ON FORM FAA-7460-1)

( ) (A) PROPOSED ANTENNA STRUCTURE EXCEEDS 200 FEET IN HEIGHT AGL
( ) (B) (1) EXCEEDS 100:1 SLOPE FOR AN AIRPORT WITH A RUNWAY OF MORE THAN 3,200 FEET IN LENGTH (EXTENDS 20,000 FEET)
( ) (2) EXCEEDS 50:1 SLOPE FOR AN AIRPORT WITH RUNWAYS NO MORE THAN 3,200 FEET IN LENGTH (EXTENDS 10,000 FEET)
( ) (3) EXCEEDS 25:1 SLOPE FOR A HELIPORT. (EXTENDS 5,000 FEET)
( ) (C) SITE IS WITHIN AIRPORT BOUNDARY.
( ) (D) SITE IS IN INSTRUMENT APPROACH AREA AND APPEARS CRITICAL.

17.14 EXEMPTION FROM NOTICE: ( ) (A) 20 FOOT CRITERIA ( ) (B) SHIELDING

AIRPORT: ELEVATION AND LONGEST RUNWAY:

ANTENNA HEIGHT ABOVE AIRPORT: DISTANCE FROM RUNWAY:

FAA ACTION REQUIRED: ( ) YES ( ) NO

OBSTRUCTION CRITERIA EXCEEDED: ( ) YES ( ) NO

NO OBSTRUCTION MARKING REQUIRED: ( )

FAA ACTION: ( ) CLEARED ( ) DISAPPROVED

MARKING REQUIRED, FORM 715

REMARKS:

SPECIAL AND GENERAL PROVISIONS
FOR RADIO STATION AUTHORIZATION

The radio station authorization granted on FCC Form 488 for File No. 179-DSE-MP/L -97, CALL SIGN: E900081 is subject to additional terms and conditions specified by code numbers on that form. The text of these special and general provisions is given below:

2932 - This authorization is subject to the terms and conditions set forth in Order and Authorization, 7 FCC Rcd 942 (1992).

FEDERAL COMMUNICATIONS COMMISSION
INTERNATIONAL BUREAU

ANTENNA DATA REPORT

SEND TO: ANTENNA SURVEY BRANCH
DATE FILED: 11/06/1996

RETURN TO: SATELLITE ENGINEERING BRANCH
ATTN: DMG

APPLICANT: AMSC SUBSIDIARY CORPORATION

ANALYSIS RECORD

FILE NUMBER: 179-DSE-MP/L -97 CALL SIGN: E900081
SITE-ID:

SITE LOCATION ADDR: 30,000 Mobile Earth Stations
COUNTY: (30,000 units)
CITY/STATE: ,

COORDINATES: ' '' LAT ' '' LONG

SITE ELEVATION: FEET

MAXIMUM ANTENNA HEIGHT: 1st FEET (AGL)
2nd FEET (AMSL)

RECEIVED:

RETURNED:

HELD FOR FAA ACTION:

FAA ACTION/FILE:

COMPLETED:

REVIEWED:

ACTION:

( ) NEW EARTH STATION ANTENNA
( ) MODIFICATION OF EXISTING EARTH STATION ANTENNA

TO BE COMPLETED BY ANTENNA SURVEY BRANCH

17.7 NOTIFICATION CRITERIA (FILE NOTICE OF PROPOSED CONSTRUCTION WITH FAA ON FORM FAA-7460-1)

( ) (A) PROPOSED ANTENNA STRUCTURE EXCEEDS 200 FEET IN HEIGHT AGL
( ) (B) (1) EXCEEDS 100:1 SLOPE FOR AN AIRPORT WITH A RUNWAY OF MORE THAN 3,200 FEET IN LENGTH (EXTENDS 20,000 FEET)
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17.14 EXEMPTION FROM NOTICE: ( ) (A) 20 FOOT CRITERIA ( ) (B) SHIELDING

AIRPORT: ELEVATION AND LONGEST RUNWAY:

ANTENNA HEIGHT ABOVE AIRPORT: DISTANCE FROM RUNWAY:

FAA ACTION REQUIRED: ( ) YES ( ) NO

OBSTRUCTION CRITERIA EXCEEDED: ( ) YES ( ) NO

NO OBSTRUCTION MARKING REQUIRED: ( )

FAA ACTION: ( ) CLEARED ( ) DISAPPROVED

MARKING REQUIRED, FORM 715

REMARKS:

FEDERAL COMMUNICATIONS COMMISSION
INTERNATIONAL BUREAU

ANTENNA DATA REPORT

SEND TO: ANTENNA SURVEY BRANCH
DATE FILED: 11/06/1996

RETURN TO: SATELLITE ENGINEERING BRANCH
ATTN: DMG

APPLICANT: AMSC SUBSIDIARY CORPORATION

ANALYSIS RECORD

FILE NUMBER: 179-DSE-MP/L -97 CALL SIGN: E900081
SITE-ID:

SITE LOCATION ADDR: 30,000 Mobile Earth Stations
COUNTY: (30,000 units)
CITY/STATE: ,

RECEIVED:

RETURNED:

HELD FOR FAA ACTION:

COORDINATES: ' '' LAT ' '' LONG

FAA ACTION/FILE:

SITE ELEVATION: FEET

COMPLETED:

MAXIMUM ANTENNA HEIGHT: 1st FEET (AGL)
2nd FEET (AMSL)

REVIEWED:

ACTION:

( ) NEW EARTH STATION ANTENNA
( ) MODIFICATION OF EXISTING EARTH STATION ANTENNA

TO BE COMPLETED BY ANTENNA SURVEY BRANCH

17.7 NOTIFICATION CRITERIA (FILE NOTICE OF PROPOSED CONSTRUCTION WITH FAA ON FORM FAA-7460-1)

( ) (A) PROPOSED ANTENNA STRUCTURE EXCEEDS 200 FEET IN HEIGHT AGL
( ) (B) (1) EXCEEDS 100:1 SLOPE FOR AN AIRPORT WITH A RUNWAY OF MORE THAN 3,200 FEET IN LENGTH (EXTENDS 20,000 FEET)
( ) (2) EXCEEDS 50:1 SLOPE FOR AN AIRPORT WITH RUNWAYS NO MORE THAN 3,200 FEET IN LENGTH (EXTENDS 10,000 FEET)
( ) (3) EXCEEDS 25:1 SLOPE FOR A HELIPORT. (EXTENDS 5,000 FEET)
( ) (C) SITE IS WITHIN AIRPORT BOUNDARY.
( ) (D) SITE IS IN INSTRUMENT APPROACH AREA AND APPEARS CRITICAL.

17.14 EXEMPTION FROM NOTICE: ( ) (A) 20 FOOT CRITERIA ( ) (B) SHIELDING

AIRPORT:

ELEVATION AND LONGEST RUNWAY:

ANTENNA HEIGHT ABOVE AIRPORT:

DISTANCE FROM RUNWAY:

FAA ACTION REQUIRED: ( ) YES
( ) NO

OBSTRUCTION CRITERIA EXCEEDED: ( ) YES
( ) NO

NO OBSTRUCTION MARKING REQUIRED: ( )

FAA ACTION: ( ) CLEARED
( ) DISAPPROVED

MARKING REQUIRED, FORM 715

REMARKS:

FEDERAL COMMUNICATIONS COMMISSION
INTERNATIONAL BUREAU

SATELLITE ENGINEERING BRANCH
SATELLITE & RADIO COM. DIVISION

FILE NO: 179-DSE-MP/L -97 ( )
FEE NO: 8160105-002 CALL SIGN: E900081-
SITE-ID:

DATES: FILED: 11/06/1996 LOGGED: 11/21/1996 UPDATED: 12/12/1996 PUBLIC NOTICE: / /

APPLICANT: AMSC SUBSIDIARY CORPORATION
APPLICANT CODE: AMSCSC
SITE ADDRESS: 30,000 Mobile Earth Stations CITY: COUNTY: (30,000 units) STATE:
INFORMATIVE: Granted on November 20, 1996, modification of existing L-band authorization, file number 681-DSE-MP/L-95, DA 95-1701, to add/operating mobile L-band terminal resulting from Rockwell International Corporation surrender of its existing license authorization for such terminals (Order and Authorization file number 1051-DSE-MP/L-95, DA 95-1919).

COORDINATES

LAT
LONG

STATUS: AC -11/22/1996- -DMG/FP
CURRENT STATION AUTHORIZATION: 681-DSE-MP/L -95
ENVIRONMENTAL ACTION:

INTERIM ACTION: - / / - / / - - / /
SERVICE CODES: DFS, -MES-C-TR
POINTS OF COMMUNICATION: AMSC-1,,,,
,,,,,

CONDITIONS: 2932

		FREQUENCIES (MHz)	POL	EMISSION	EIRP (dBW)	EIRP DEN. (dBW/4kHz)	ASSOCIATED ANTENNA(S)	SPECIAL PROVISIONS
1.	R	1530.0000- 1559.0000	C	1K20G1D				
2.	R	1530.0000- 1559.0000	C	2K40G1D				
3.	R	1530.0000- 1559.0000	C	4K80G1D				
4.	R	1530.0000- 1559.0000	C	9K60G1D				
5.	T	1626.5000- 1660.5000	C	1K20G1D	14.00	14.00		
6.	T	1626.5000- 1660.5000	C	2K40G1D	17.00	17.00		
7.	T	1626.5000- 1660.5000	C	4K80G1D	20.00	20.00		
8.	T	1626.5000- 1660.5000	C	9K60G1D	23.00	23.00		

RECORD OF COMMISSION ACTION

( )APPROVED ( )DISMISSED ( )DENIED ( )SURRENDERED ( )APPROVED AS MODIFIED ABOVE
BY ON / / PURSUANT TO AUTHORITY DELEGATED BY

COMMISSION ACTION REPORTED TO APPLICANT BY ON

DATA ENTRY:_____ DATE:___/___/___ REFERRED TO:_____ DATE:___/___/___
FEES:_____ DATE:___/___/___ REFERRED TO:_____ DATE:___/___/___
APP. COMPLETE:_____ DATE:___/___/___ REFERRED TO:_____ DATE:___/___/___
TECHNICAL:_____ DATE:___/___/___ REFERRED TO:_____ DATE:___/___/___
LEGAL:_____ DATE:___/___/___ REFERRED TO:_____ DATE:___/___/___

FEDERAL COMMUNICATIONS COMMISSION

FCC REMITTANCE ADVICE

Approved by OMB
3060-0589
Expires 2/28/97

PAGE NO. 1 OF 1

(RESERVED)

SPECIAL USE: FCC/MELLON NOV 06 1996

FCC USE ONLY

(Read instructions carefully BEFORE proceeding.)

PAYOR INFORMATION

(1) FCC ACCOUNT NUMBER: 0 5 3 0 1 9 0 5 2 3

Did you have a number prior to this? Enter it.

Received NOV 14 1996

(2) TOTAL AMOUNT PAID (dollars and cents): $ 130 • 00

DUPLICATE

(3) PAYOR NAME (If paying by credit card, enter name exactly as it appears on your card)
Fisher Wayland:RLG

(4) STREET ADDRESS LINE NO. 1
2001 Pennsylvania Avenue N.W., #400

(5) STREET ADDRESS LINE NO. 2

Satellite and Radiocommunications Division International Bureau

(6) CITY: Washington

(7) STATE: DC

(8) ZIP CODE: 20006

(9) DAYTIME TELEPHONE NUMBER (Include area code)
(202) 659-3494

(10) COUNTRY CODE (if not U.S.A.)

ITEM #1 INFORMATION

(11A) NAME OF APPLICANT, LICENSEE, REGULATEE, OR DEBTOR
AMSC Subsidiary Corporation

FCC USE ONLY

(12A) FCC CALL SIGN/OTHER ID	(13A) ZIP CODE	(14A) PAYMENT TYPE CODE	(15A) QUANTITY	(16A) FEE DUE FOR PAYMENT TYPE CODE IN BLOCK 14
681-DSE-MP/L-95	22091	C G B	1	$ 130.00

(17A) FCC CODE 1

(18A) FCC CODE 2

(19A) ADDRESS LINE NO. 1	(20A) ADDRESS LINE NO. 2)	(21A) CITY/STATE OR COUNTRY CODE
10802 Parkridge Blvd.		Reston, VA

ITEM #2 INFORMATION

(11B) NAME OF APPLICANT, LICENSEE, REGULATEE, OR DEBTOR

FCC USE ONLY

(12B) FCC CALL SIGN/OTHER ID	(13B) ZIP CODE	(14B) PAYMENT TYPE CODE	(15B) QUANTITY	(16B) FEE DUE FOR PAYMENT TYPE CODE IN BLOCK 14
				$

(17B) FCC CODE 1

(18B) FCC CODE 2

(19B) ADDRESS LINE NO. 1	(20B) ADDRESS LINE NO. 2	(21B) CITY/STATE OR COUNTRY CODE

CREDIT CARD PAYMENT INFORMATION

(22) MASTERCARD/VISA ACCOUNT NUMBER:

☐ Mastercard

EXPIRATION DATE: Month Year

☐ Visa

(23) **I hereby authorize the FCC to charge my VISA or Mastercard for the service(s)/authorization(s) herein describe.** ☞

AUTHORIZED SIGNATURE DATE

See public burden estimate on reverse.

FCC FORM 159
April 1994

American Mobile Satellite Corporation

10802 Parkridge Boulevard
Reston VA 22091

Telephone 703/758-6150
Fax 703/758-6111

Lon C. Levin
Vice President and Regulatory Counsel

November 6, 1996

DUPLICATE

Via Courier Delivery to Mellon Bank

William F. Caton, Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

Re: Request for Minor Modification
File No. 681-DSE-MP/L-95

Dear Mr. Caton:

AMSC Subsidiary Corporation ("AMSC") and Rockwell International Corporation ("Rockwell") have entered into an agreement for AMSC to provide service to Rockwell's existing Mobile Satellite Service customers using their installed Rockwell-manufactured mobile terminals. Concurrent with the consummation of the agreement, which is presently scheduled for November 15, 1996, Rockwell will surrender its blanket mobile terminal license, FCC File No. 1051-DSE-MP/L-95. *See* attached letter from Rockwell. The Rockwell authorization permits Rockwell to offer service in the lower L-band to up to 18,000 mobile terminals.

AMSC respectfully requests that the Commission modify the above-referenced authorization to permit AMSC to operate up to 18,000 additional mobile terminals in the lower L-band, essentially in place of Rockwell. With AMSC's present authorization for 15,100 mobile terminals in the lower L-band, this will permit AMSC to operate as many as 33,100 of the specified terminals. The technical and operational characteristics of the Rockwell-manufactured equipment complies with the requirements in the above-referenced authorization. The modification would be conditioned on Rockwell's surrender of its own authorization. Any challenges to Rockwell's authorization would become moot upon the surrender of its license.

AMSC has consulted with the U.S. Coast Guard with respect to this modification application and it does not object.

Attached hereto is a check made payable to the Federal Communications Commission for the sum of One Hundred Thirty Dollars ($130.00) to cover the fee associated with this filing. AMSC hereby certifies that no party to this application is subject to a denial of Federal benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. §853(a).

Please address any questions concerning this matter to the undersigned or to Bruce Jacobs at 775-3543.

Very truly yours,

Lon C. Levin

cc: Harry Ng
Frank Peace
Steve Sharkey
James Talens

ATTACHMENT

Arlington, VA 22202-3475
USA

Rockwell

November 6, 1996

Mr. William F. Caton, Acting Secretary
Federal Communications Commission
1919 M Street, NW
Room 222
Washington, DC 20554

Re: Surrender of MSS Authorization

Dear Mr. Caton:

On September 6, 1995, the Federal Communications Commission ("the Commission") issued an Order and Authorization (FCC File No 1051 DSE-MP/L-95, DA 95-1919) granting Rockwell International Corporation ("Rockwell") authority to construct and operate, subject to certain conditions, up to 30,000 Mobile Earth Terminals ("METs") (including those authorized in the lower L-band) throughout the United States using AMSC-1 space segment capacity in the upper L-band and to operate up to 18,000 METs in the lower L-band in accordance with the operational and response parameters specified by Rockwell in its application. AMSC Subsidiary Corporation ("AMSC) was similarly authorized to operate 30,000 METs in the upper L-band and up to 12,100 METs in the lower L-band (FCC File No. 681- DSE-MP/L-95, DA 95-1701). Rockwell currently has approximately 9000 METs deployed and operating in the lower L-band in accordance with the above Order and Authorization.

Rockwell and AMSC have entered into a Letter of Intent wherein AMSC has agreed to provide service to Rockwell's existing Mobile Satellite Service ("MSS") customers using the installed Rockwell-manufactured mobile terminals which Rockwell is currently authorized to provide under the above Order and Authorization. Upon the execution of a formal agreement, Rockwell will discontinue its MSS business activities.

Accordingly, concurrent with the consummation of the Agreement between Rockwell and AMSC,, Rockwell will surrender to the Commission its Authorization for providing MSS services. Rockwell will formally notify the Commission upon closing and the cessation of its MSS business activities. Rockwell also asks that the Commission look favorably upon any request by AMSC to increase its authorization to include the Rockwell authorization; i.e., up to a total of 33,100 METs in the lower-L-band

Please direct any questions to the undersigned at 703-412-6696.

Respectfully submitted,

ROCKWELL INTERNATIONAL CORPORATION

By: Linda C Sadler
Linda C. Sadler
Authorized Representative

Enclosure - Order and Authorization dated September 6, 1995

[illegible]

DA 95-1919

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In re Application of	)	
	)	
ROCKWELL INTERNATIONAL CORPORATION	)	File No. 1051-DSE-MP/L-95
	)	
	)	
For Modification of its Blanket License to Construct and Operate 15,000 L-Band Mobile Earth Stations	)	

ORDER AND AUTHORIZATION

Adopted: September 6, 1995 Released: September 7, 1995

By the Chief, Satellite and Radiocommunication Division:

I. INTRODUCTION

1. Rockwell International Corporation seeks to serve its customers using capacity on AMSC Subsidiary Corporation's recently launched satellite, replacing the satellite capacity it is currently leasing from Inmarsat. Toward that end, Rockwell has filed an application to modify its current interim authorization, which permits it to operate up to 15,000 data mobile earth terminals (METs) to provide land mobile-satellite service (LMSS).[1] Its interim authorization permits the use of facilities leased from Comsat and Inmarsat in the lower L-band (1530-1544/1626.5-1645.5 MHz).[2] This modification application requests authorization to shift the LMSS service to AMSC's satellite, AMSC-1, and to increase the number of METs to 30,000.[3]

2. We grant Rockwell's application in part, subject to certain technical and operational conditions in keeping with prior Commission decisions. This authorization permits Rockwell to expand its range of services using AMSC-1 space segment, and completes a major step in the creation of competition in the provision of messaging service on a worldwide basis.

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[1] See In the Matter of the Application of Rockwell International Corporation for Blanket License for 15,000 Mobile Earth Stations, 7 F.C.C. Rcd. 942 (1992) (Blanket Authorization).

[2] Comsat has been authorized to lease Inmarsat space segment capacity on the Marisat F-1 AOR (Atlantic Ocean Region) satellite located at 106° W.L. and to lease an earth station at Southbury, Connecticut to AMSC for this service. See Blanket Authorization, supra, at para. 3.

[3] Public Notice of the application appeared on June 7, 1995 (Report No. DS-1539). No petitions or comments were filed. On July 21, 1995, Rockwell filed a request for Special Temporary Authority (STA) to commence using the AMSC-1 space segment for its METs. That STA request is now moot.

II. BACKGROUND

3. In the Blanket Authorization, Rockwell was authorized to operate 15,000 low data rate METs anywhere in the United States for domestic LMSS communications using the Marisat F-1 AOR satellite (through Comsat and Inmarsat) pending dedication of AMSC's satellite system. This order also requires Rockwell and other domestic LMSS providers[4] to file a transition plan with the Commission within 90 days after launch of AMSC's satellite to assure a smooth and expeditious migration of domestic LMSS traffic to the upper L-band (1545-1559/1646.5-1660.5 MHz).[5] The Commission imposed no other technical requirements on LMSS terminals.[6]

4. Rockwell now seeks authority to operate a total of 30,000 METs on a permanent basis through the AMSC-1 space segment. It currently operates some 6000 METs in the lower L-band using leased Inmarsat facilities.[7] All of Rockwell's METs are capable of operating in both the upper L-band and the lower L-band.[8] Rockwell also states that it will continue to provide service to its existing customers, and its says it will use the remainder of its requested 30,000 METs in the upper L-band for future growth.

5. Rockwell states that the technical specifications for its data METs, which are essentially Inmarsat "Standard-C" units, are the same as those discussed in the Blanket Authorization. AMSC says the change is only that the terminals will use the AMSC-1 space segment (instead of Inmarsat) and operate over a different range of frequencies. The 30,000 METs for which Rockwell seeks permanent authority will be capable of operating in both the lower L-band and in the upper L-band, where AMSC is now authorized to operate its satellite.[9]

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[4] AMSC was similarly authorized to operate 30,000 METs. Blanket Authorization, supra. Other interim LMSS providers were also authorized, subject to obtaining a lease from Comsat to access Inmarsat space station capacity. Id.

[5] This application is filed pursuant to this requirement.

[6] See Blanket Authorization, supra. See also In the Matter of the Application of American Mobile Satellite Corporation for Blanket License for 30,000 Mobile Earth Stations, 8 F.C.C. Rcd. 6310 (1993) (30,000 METs Reconsideration).

[7] Rockwell STA Request at 2.

[8] Cf. Application of AMSC in File No. 681-DSE-MP/L-95, DA 95-1701 (August 1, 1995) (authorization of AMSC to provide 30,000 METs in the upper L-band using full-duplex equipment, and under Special Temporary Authority and waiver of US315 to use METs currently in use in the lower L-band for two years) (AMSC Order and Authorization); see also *sua sponte* Recon. in File No. 681-DSE-MP/L-95, DA 95-1723 (August 4, 1995) (expanded waiver to include 12,000 additional existing METs).

[9] See AMSC Licensing Order, 4 F.C.C. Rcd. 6041 (1989), Final Decision on Remand, 7 F.C.C. Rcd. 266 (1992); aff'd sub nom. Aeronautical Radio, Inc. v. FCC, 983 F.2d 75 (1993) (authorization to provide services in the upper L-band). See also 200,000 METs Blanket, File 2823-DSE-P/L-93, DA-95-482, released March 13, 1995 (authorization to use up to 200,000 voice METs in the upper L-band). We stated, at para. 13 of the 200,000 METs Blanket, that "This MET operating authorization . . . encompasses operation only in the frequencies 1545-1559/1646.5-1660.5 MHz [the upper L-band]." The issue of AMSC's

6. In both the upper L-band and the lower L-band, Mobile Satellite Service (MSS) operators such as Rockwell must be able to provide "real-time preemptive capability" for certain safety and distress services.[10] In the upper L-band, the relevant safety-related service is the Aeronautical Mobile Satellite (Route) Service (AMS(R)S), while in the lower L-band the relevant safety-related service is the Global Maritime Distress and Safety System (GMDSS). Rockwell's proposal to transition its METs from the lower L-band to the upper L-band thus requires us to determine whether Rockwell's new METs are consistent with the safety requirements of a different range of frequencies, in which somewhat different safety considerations may apply.

III. DISCUSSION

7. We will modify Rockwell's authorization to permit operation of up to 30,000 METs in the upper L-band, on the condition that those METs provide real-time preemptive capability as described in this Order. However, as we discuss below, we will not authorize Rockwell's operation of its existing 6000 METs[11] in the upper L-band because of concerns expressed by the Federal Aviation Administration (FAA) and the National Telecommunications and Information Administration (NTIA) over the real-time preemptive capabilities of these terminals. Instead, we will allow Rockwell to continue operating its existing METs in the lower L-band temporarily, until it can introduce METs that

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permanent use of the lower L-band for its services, as well Rockwell's use of the lower L-band, is pending in File No. 59-DSS-MP-MP/ML-93. Rockwell states that it is willing and capable of operating in the lower L-band over AMSC-1. In AMSC Order and Authorization, the Chief, International Bureau stated that, in view of the complex policy and legal issues associated with File No. 59-DSS-MP-MP/ML-93, he would deny AMSC's request for Special Temporary Authority to operate its 30,000 METs in the lower L-band. Rockwell has not sought such authority in its subject application. Nevertheless, we find that the public interest will be served by granting Rockwell authority to operate 6,000 existing and 12,000 additional METs in the lower L-band using AMSC-1 space segment. See paras. 15-18, infra. In all other respects, Rockwell will be expected to comply with its commitments to transition to the upper L-band.

[10] Section 2.106 of the Commission's Rules contains the Table of Frequency Allocations. The Table includes footnotes which denote stipulations applicable to both U.S. Government and non-Government stations. Each such footnote contains the "US" prefix. Other footnotes in the Table apply to international spectrum use; these do not contain a prefix. Footnote US308 states that in the 1549.5-1558.5/1651-1660 MHz bands the AMS(R)S requirements that cannot be accommodated in the 1545-1549.5 MHz, 1558.5-1559 MHz, 1646.5-1651 MHz and 1660-1660.5 MHz bands shall have priority access with real-time preemptive capability with respect to communications in the MSS. Systems not interoperable with AMS(R)S shall operate on a secondary basis. Account shall be taken of the priority of safety-related communications in the MSS. Note 729A states generally that, notwithstanding any other provision of the Radio Regulations relating to restrictions in the use of the bands allocated to AMS(R)S for public correspondence, the bands 1545-1555 MHz and 1646.5-1656.5 MHz may be authorized by administrations for public correspondence with aircraft earth stations. Note 730C, which applies to United States domestic service, states that the band 1555-1559/1656.5-1660 MHz is allocated to MSS on a primary basis subject to the conditions that AMS(R)S shall have priority access and immediate availability over all other mobile-satellite communications within a network operating under this provision; mobile-satellite systems shall be interoperable with the AMS(R)S; and account shall be taken of the priority of safety-related communications in the other MSS services.

[11] Rockwell's original application stated that there are 4,500 extant METs, but its STA Request indicates there are 6,000. We will rely on the later figure of 6,000 in our analysis herein.

satisfy the concerns of the aeronautical community. In AMSC Order and Authorization, we granted AMSC Special Temporary Authority to operate AMSC-1 in the lower L-band so that the existing METs can migrate to AMSC's satellite as required by our prior orders.

8. Upper L-band and Real-Time Preemption. The upper L-band is allocated to both MSS and AMS(R)S, which governs safety-related communications and regularity of aircraft flight. In its AMSC Licensing Order, the Commission required AMSC to incorporate into its overall system design whatever minimum requirements for aeronautical satellite communications systems are endorsed internationally through the International Civil Aviation Organization.[12]

9. This issue was also raised in the 200.000 METs proceeding, following concerns expressed by the FAA and NTIA on the matter of protection of safety-related communications and distress communications in the upper L-band.[13] In the 200.000 METs Order, the Chief, International Bureau conditioned AMSC's use of the upper L-band on several operational/technical conditions, including:

(1) All METs that do not continuously monitor a separate signalling channel shall have provision for signalling within the communications channel; and

(2) Each MET shall automatically inhibit its transmissions on any or all channels receiving a channel-shut-off command on a signalling or communications channel it is receiving from its associated Land Earth Station.[14]

The voice METs at issue in 200.000 METs complied with these conditions. Both the voice METs and AMSC's operating system function in a "full-duplex" mode (i.e., simultaneous transmission and reception of signals) permitting preemption of MSS for AMS(R)S traffic on a virtually instantaneous basis.[15] This comports with ITU Regulations Footnote 730C, which requires immediate availability of frequencies for AMS(R)S, and Footnote US308, which requires real-time preemptive access for AMS(R)S.[16] We believe that these requirements are equally applicable to Rockwell's METs.

10. Rockwell states that its data terminals will operate in a "half-duplex" mode -- that is, they cannot receive signals while they are transmitting. The instruction to the data MET to cease transmitting comes from a land earth station on a TDM (time division multiplexed) carrier, but the MET cannot act on that instruction while it is transmitting. In a worst-case situation under normal operating conditions, a Rockwell data MET could transmit for as long as 24 seconds, though the length of time the MET may actually transmit can be limited by the protocol used in the system and

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[12] See AMSC Licensing Order, supra.

[13] 200.000 METs Blanket, supra.

[14] Id., para. 18.

[15] See Supplemental Letter to Secretary, FCC from Chief Scientist, AMSC, dated March 23, 1995, at 3. See also Letter to Secretary, FCC from Senior Scientist, AMSC, dated June 20, 1995.

[16] See Section 2.106 of the Commission's Rules, 47 C.F.R. § 2.106.

further limited by the Rockwell mobile terminal's software. The typical transmission length, Rockwell states, is less than four seconds with an average length of 0.502 seconds. Rockwell further states that 99.98 percent of all transmissions during a recent test of their system were less than 4 seconds in duration and 100 percent of the transmissions were less than nine seconds in length.

11. NTIA and FAA did not file comments in this proceeding, but we incorporate their positions herein because the issues are identical. NTIA and FAA object to any MET that is half-duplex rather than full-duplex in design, i.e., cannot receive a command for real-time preemption during MET transmissions. According to the FAA, Rockwell cannot comply with Footnote US308 to the U.S. Table of Allocations, or with Footnote 730C of the ITU's table of frequency allocations, which require immediate preemption of non-AMS(R)S transmissions for AMS(R)S transmissions. FAA recommends that the FCC: (1) require that half-duplex METs be modified for full-duplex operation, with real-time preemptive capability, or (2) grant authority to allow continued use of extant terminals with the AMSC-1 satellite in the lower L-band only.

12. Rockwell suggests that the vast majority of data transmissions, even on half-duplex terminals, could be preempted in seconds. More fundamentally, Rockwell argues that a number of features of its overall *system*, working together with AMSC's system, enable it to provide real-time preemption even though not every AMSC *terminal* can do so. Rockwell states that AMSC's Network Operations Center will continuously monitor not only the data traffic, but also voice traffic and all other types of traffic on the system. As noted in the AMSC Order and Authorization, the AMSC Network Operations Center will allocate frequencies to these various networks, taking frequencies away from lower-priority users and giving them to higher-priority users, such as AMS(R)S users. In addition, the Network Operations Center will always maintain a "reserve pool" of unoccupied frequencies, which can be allocated to AMS(R)S without preempting any other user.

13. Rockwell states that the maximum time needed to shut down the message channel associated with its METs is about 61 seconds. For 99.98 percent of the messages sent by its METs the required time to cease transmission is approximately 41 seconds.[17] Rockwell further states that message length and half-duplex operation add minimally to the overall preemption time, particularly because the maximum message length can be limited to a few seconds.[18] It claims that conversion to full-duplex would not significantly improve preemption time.[19]

14. The primary question before us with regard to preemption, as it was in AMSC Order and Authorization, is whether Rockwell's statistical, systematic approach to achieving real-time preemption satisfies Footnotes US308 and 730C. For the same reasons we found that it did not in AMSC Order and Authorization, we find that it does not here either. Notwithstanding Rockwell's arguments that it has satisfied the real-time preemptive access requirement, we remain reluctant to overrule NTIA. Therefore, we conclude that Rockwell may not use its half-duplex METs in the upper L-band at this time. We now proceed to discuss whether Rockwell may continue to operate its data METs in the lower L-band, as suggested by FAA and NTIA by its comments in the AMSC

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[17] See Rockwell Application File No. 1051-DSE-MP/L-95, Attachment A, Exhibit 2 at 2-3.

[18] Id. at 5.

[19] Id.

proceeding.[20]

15. Lower L-band and preemption. Just as Footnote US308 protects AMS(R)S in the upper L-band, US315 is intended to protect maritime mobile-satellite distress and safety communications domestically by providing priority access and real-time preemptive capability for distress and safety communications.[21] The language of US315 is sufficiently similar to US308 that we cannot conclude that US308 requires full-duplex METs but US315 does not. We are therefore inclined to believe that Rockwell (like Inmarsat, Mexico, and others, including AMSC) currently provides mobile satellite service in the lower L-band frequencies using METs that do not comply fully with the requirements of Footnote US315 to Section 2.106 of the Commission's Rules. The low data rate "Standard C" terminal and similar models used by Rockwell and others do not operate in a full-duplex mode and therefore are not capable of real-time termination of METs transmission (i.e., they cannot interrupt a transmission once it has commenced).

16. However, as we discussed in AMSC Order and Authorization, the maritime distress and safety services have been operational for years and are sufficiently robust and dynamic to permit us to consider less rigorous enforcement of US315 than we must require for the aeronautical services under US308. The aeronautical distress and safety-related services are untested and are potentially more time-sensitive than their maritime counterparts due to higher aeronautical vehicle velocities. We also note that the half-duplex maritime mobile satellite service (MMSS) METs currently in use have not adversely affected the effectiveness of the Global Maritime Distress and Safety System (GMDSS), although operation of the GMDSS began only three years ago and is not fully implemented. As we observed in AMSC Order and Authorization, however, in the next two years there may be a substantial increase in the number of MMSS METs in use worldwide.

17. Based on Rockwell's statistical analysis of average message length and related information, we believe that, under current conditions, existing data METs in the lower L-band will provide sufficient distress and safety communication priority to comply with the intent of US315. It is also our understanding from the United States Coast Guard and NTIA that an additional 12,000 METs can be safely accommodated in the lower L-band for a two-year period. For these reasons we believe it appropriate to issue a temporary waiver of Footnote US315 to Section 2.106 of our Rules. This waiver will continue to require Rockwell to operate on a secondary basis to, and avoid harmful interference to, GMDSS.

18. Further, the waiver applies only to METs currently used by Rockwell and an additional 12,000 such METs, and only insofar as they are used to access AMSC's space segment. The waiver will terminate on July 31, 1997. In this way, we can be reasonably assured that when MMSS METs are more prevalent and GMDSS preemption therefore potentially more urgent, the

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[20] See AMSC Order and Authorization at para. 17.

[21] US315 states as follows: In the frequency bands 1530-1544 MHz and 1626.5-1645.5 MHz maritime mobile-satellite distress and safety communications, e.g., GMDSS, shall have priority access with real-time preemptive capability in the mobile-satellite service. Communications of mobile-satellite system stations not participating in the GMDSS shall operate on a secondary basis to distress and safety communications of stations operating in the GMDSS. Account shall be taken of the priority of safety-related communications in the mobile-satellite service.

requirements of US315 will be followed strictly.[22] We have already conditioned AMSC's METs authorization on AMSC maintaining its continued use of its AMSC Network Operations Center management and operational standards as set forth in its application and pleadings. Such a requirement need not be imposed on Rockwell because Rockwell will subscribe to AMSC's space segment and will be subject to AMSC's Network Operations Center. However, we will require Rockwell to maintain the current message-length statistics as indicated in its application and pleadings.

21. Lower L-band emission suppression. Section 25.202(f) of the Commission's Rules contains the out-of-band emissions limits that apply to the instant case. Our review of Rockwell's application[23] reveals no apparent out-of-band emission violation of Section 25.202(f). While the issue was not raised in this proceeding, we believe it useful to state, as we did in AMSC Order and Authorization, supra, that any questions concerning out-of-band emissions should in the first instance be addressed by the parties themselves.[24] Further, any perceived potential for interference with other countries' systems should be resolved in a cooperative way, based on technical analysis and discussion among the users of the spectrum.[25]

22. Future L-band Operation. The long-term use of the lower L-band is currently being considered by the Commission in File No. 59-DSS-MP-MP/ML-93. We cannot and do not predict whether the Commission will ultimately assign that spectrum to AMSC or to other applicants. We have concluded, however, that the public interest will be served by granting Rockwell authority to operate its existing METs plus 12,000 additional METs in the lower L-band, using AMSC-1 space segment. Doing so will permit Rockwell to compete in the provision of domestic MSS services – a policy the Commission has long pursued. Further, Inmarsat will not be prejudiced because the Commission's prior orders contemplated that Rockwell, AMSC, and others would be operating data METs via AMSC-1 by this time. Finally, we reject any suggestion that this authorization in any way predetermines the outcome of File No. 59-DSS-MP-MP/ML-93.

23. GPS. We are concerned that Rockwell's METs include sufficient out-of-band emission suppression to protect the Global Positioning System (GPS) and the Russian Global Navigation Satellite System (GLONASS) which operate on frequencies near L-band. In its application, Rockwell states that it complies with the criteria for meeting the spurious emission level standards to protect GPS contained in a Memorandum of Understanding (MOU) among the FCC, NTIA, and FAA.[26] The purpose of the MOU is to assure coexistence between GPS and GLONASS receivers and MSS METs operating in bands near the frequency bands used by GPS and GLONASS receivers, including METs to be used with AMSC's satellites. The provisions of the MOU establish specific out-of-band emissions

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[22] At the end of the waiver, period no Rockwell data METs will be in the lower L-band, unless the Commission so authorizes them in the lower L-band proceeding. This will complete implementation of the transition plan required by our Blanket Authorization.

[23] See Rockwell Application, Attachment A at 2-4.

[24] See AMSC Order and Authorization at para. 24.

[25] Id.

[26] See FCC Press Release (November 18, 1994); see also Rockwell Application, Attachment A at 3-4..

limitations and notification requirements in the event of detected harmful interference.[27] We believe that these provisions resolve any concern with regard to Rockwell's data METs causing harmful interference to GPS receivers from Rockwell's s METs operating in bands near the frequency bands used by GPS and GLONASS receivers.

24. Radiation Hazard Analysis. In a supplemental filing dated August 17, 1995, Rockwell provides a radiation hazard analysis for its data METs. Rockwell states that its data METs will not exceed the revised maximum permissible exposure (MPE) limits established in IEEE/ANSI C95.1-1991. Rockwell indicates that the antennas used with its METs are quadrafilar helix in design, 10.1 cm tall and 3.5 cm in diameter. Applying the MPE limit of 1.1 mW/cm^2 under ANSI C95.1-1991, the separation distance required for Rockwell's MET antennas is 5.4 cm (2.1 inches).[28] Rockwell further states that its MET antennas will be mounted within a radome enclosure having a radius of 11 cm and therefore will pose no radiation hazard to unsuspecting persons nearby. Based on this analysis, we find that Rockwell's METs meet the ANSI C-95-1991 MPE limit and are in compliance with Commission Rules regarding radiation hazards. We note, however, that subsequent Commission action in ET Docket No. 93-62 may affect future Rockwell METs.[29]

IV. CONCLUSION

25. Our authorization to Rockwell to operate up to 30,000 data METs using AMSC-1 space segment represents a further step in the creation of competition in the provision of messaging service on a worldwide basis. Accordingly, we find, pursuant to sections 309 and 319 of the Communications Act of 1934, that the public interest will be served by granting Rockwell authority to operate approximately 6,000 existing data METs, which are using Inmarsat facilities in the lower L-band, using AMSC-1 space segment. In addition, we find that the public interest will be served by granting Rockwell authority to operate an additional 12,000 such METs in the lower L-band, also using AMSC-1 space segment. Authority for these data METs is issued pursuant to a temporary waiver of note US315 of Section 2.106 of the Rules. Rockwell may construct and operate a total of up to 30,000 METs in the upper-L band (less the number of METs it uses at the same time in the lower L-band), if the METs comply with the full-duplex requirement and the other, related

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[27] RTCA (formerly The Radio Technical Commission for Aeronautics) Special Committee 165 (SC-165) is currently developing equipment performance standards in the L-band, as well as the standards for METs adopted in the Commission's proceedings. See American Mobile Satellite Corp., 7 F.C.C. Rcd. 942, 945-47 (1992). See also RTCA, Guidance on AMSS End-to-End System Performance (DO-215, may 13, 1993); RTCA, Minimum Operational Standards for AMSS, Part A (DO-210 Part A, June 19, 1992), and Part B (DO-210 Part B, May 13, 1993). RTCA SC-159, WG-6, is currently addressing matters of interference to Global Navigation Satellite Systems by MSS operations.

[28] Rockwell assumes a duty cycle of 1/30, i.e., a typical maximum message transmission time from an MMS terminal of 1 minute over any 30 minute period. The maximum 1600 byte message length for its MET is 23.78 seconds (0.396 minutes). The far field of Rockwell's METs begins at a distance of 11.2 cm from the antenna. The power density at the beginning of the far field is 0.10 mW/cm^2.

[29] ET Docket No. 93-62 addresses revised standards for radiofrequency radiation emissions, including exposure guidelines for people using various kinds of radio transmitting devices. The currently applicable standard for these frequency bands under Commission Rules is in ANSI C95-.1-1982, and is 5 mW/cm^2. See 47 C.F.R. § 1.1307(b).

requirements for priority and real-time preemption discussed above.

V. ORDERING CLAUSES

26. Accordingly, IT IS ORDERED that, pursuant to Section 0.261 of the Commission's rules on delegation of authority, 47 C.F.R. § 0.261, application File No. 1051-DSE-MP/L-95, IS GRANTED and Rockwell IS AUTHORIZED to operate its existing data METs and an additional 12,000 data METs using AMSC-1 space segment on specified frequencies in the lower L-band (1530-1544/1631.5-1645.5 MHz) throughout the United States, subject to the conditions set forth herein. Further, Rockwell IS AUTHORIZED to construct and operate a total of 30,000 METs (including in this number those METs authorized for use in the lower L-band) throughout the United States, using AMSC-1 space segment in authorized frequencies in the upper L-band (1545-1559/1646.5-1660.5 MHz), provided such METs operate in a full-duplex mode and fully comply with the requirements of Footnotes 730C and US308 to Section 2.106 of the Rules, and as set forth herein.

27. IT IS FURTHER ORDERED that Footnote US315 to Section 2.106 of the Commission's Rules IS WAIVED to permit Rockwell to operate all its METs in use on the date of release of this order, and an additional 12,000 such METs, in the lower L-band in accordance with the operational and response parameters set forth in Rockwell's application. Under this waiver, Rockwell shall operate on a secondary basis to safety and distress communications of those stations operating in the GMDSS. Further, the waiver shall terminate on July 31, 1997. Operation of Rockwell's METs in the lower L-band is also subject to AMSC-1 space segment authorization

28. IT IS FURTHER ORDERED that Rockwell shall file annual system usage reports, commencing with the effective date of this Order, containing the number of METs operating in the lower L-band and in the upper L-band, and maximum and average message length statistics for those data METs operating in the lower L-band. Such reports shall be submitted to the Chief, Satellite and Radiocommunication Division, International Bureau.

29. IT IS FURTHER ORDERED that Rockwell's data METs SHALL CONFORM to the provisions of the Memorandum of Understanding among the FCC, NTIA and FAA discussed at paragraph 23, herein.

FEDERAL COMMUNICATIONS COMMISSION

Thomas S. Tycz

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Chief, Satellite and Radiocommunication
Division
International Bureau