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

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

JUN 2 1993

OFFICE OF CHIEF
DOMESTIC FACILITIES DIVISION
COMMON CARRIER BUREAU

In the Matter of the)
Applications of)
NORRIS SATELLITE)
COMMUNICATIONS, INC.)
For Authority to Construct,)
Launch and Operate Communications)
Satellites in the Ka-Band)
_____)

File Nos. 54-DSS-P/L-90
55-DSS-P-90

Reply to Motorola Opposition

COMES NOW Norris Satellite Communications, Inc. ("Norris") through counsel Hartke & Hartke, in Reply to the opposition filed by Motorola Satellite Communicatoins, Inc. (hereinafter "Motorola") in the above styled matter stating as follows:

It is Norris' position that the original Application requested 700 MHz bandwidth for its operations, and that since the Commission granted the Application "in accordance with the terms, conditions and technical specifications set forth in its application" (Order, para. 22) that internal consistency compels the conclusion that the grant of authority should have been for the 700 MHz requested rather than 500 MHz. For example, there is no question that NorStar I would be utilized for supercomputer data transmission. Transmission at 1 Gigabit per second requires at least 650 MHz. Thus, since the application was approved "in accordance with its technical specifications," unless 700 MHz is authorized, NorStar I would be prohibited from this essential technological innovation for which it clearly applied.

Further, the Order at paragraph 24 authorizes the selling of 24 transponders which, according to the clear language of the Application, would require 24 MHz each, and when the spacing is added, the total bandwidth is right at 700 MHz. Thus, for the Order to be internally consistent, it cannot possibly authorize 24 transponders but then at the same time authorize a bandwidth that would require the elimination of 7 of the 24 transponders.

Finally, the Order did not require an adjustment of the Frequency Plan or the business plan, but limiting the authorization to 500 MHz would eliminate huge portions of the business referred to in the Application. To be internally consistent, since the Order grants the authority "in accordance with its application," the Order mandates inclusion of the businesses contained in the application, such as the capability for supercomputer data transmission requiring more than 500 MHz. Of course, case law requires an agency's adequate explanation for the agency decision, and in this case there is none. An appeal would judicially overturn this unsupportable agency decision authorizing 500 MHz when 700 MHz was requested. (See NAACP v. FCC, 688 F2d 993 (D.C. Cir., 1982). The Petition for Reconsideration provides the agency with the opportunity to conform its ruling that it is granting the application "in accordance with" the terms and conditions of the application to the Application's request for 700 MHz bandwidth.

I. 1. Motorola incorrectly claims that Norris did not request operating authority for 19.5-19.7 GHz and 29.3-29.5 GHz bands. The original Norris application requested 700 MHz, not the 500 MHz

recited in the Order and Authorization (herein "Order"). Motorola contends that "Norris never applied for any authority to operate in the 19.5-19.7 GHz and 29.3-29.5 GHz bands." That is simply not true. It is not true from a technical standpoint and it is not true from a business plan standpoint.

Please note that there is no contention in the Motorola Opposition of any "confusion" regarding the frequencies based on other references in the Application. The sole contention is that Motorola "searched in vain" to find references in the Application where Norris "desired any authority" in these relevant bandwidths. Thus, to rebut the Opposition, Norris need only show where in the Application it "desired the authority" in these bandwidths.

2. Norris' Petition for Reconsideration specifically recites the twelve (12) references in the Application which confirm that the application sought 700 MHz. (See Petition for Reconsideration, at p. 3, footnote 7). Most significantly, there is no way to deny that the Frequency Plan clearly shows that Norris requested 700 MHz. Motorola's Opposition recites only a single sentence out of the Application, while ignoring all of the other specific references to the requested bandwidths of 19.5-19.7 GHz and 29.3-30.0 GHz. The Opposition's language is that the Petition for Reconsideration was "claiming only" (Motorola's words) the one sentence selectively culled by Motorola out of the 12 references on the same page. The use by Motorola of the word "only" is patently false and misleading. It is difficult to understand how Motorola can select 1 out of 12 recitations in the Petition for

Reconsideration and then argue that there was "only one" reference in the application. Prior to filing its Opposition, Motorola could read the footnote on page 3 of the Petition for Reconsideration and recognize that their claim was specious - or at the very minimum that they were required to address all 12 references rather than making the false claim that there was only 1 reference. Motorola was on notice of those references and the entire technological innovations to be performed on this satellite. Motorola did not file a Petition to Deny this application, and it is inconceivable that Motorola is so technically unknowledgable that they did not know that NorStar I represents a huge technological advance for the United States requiring 700 MHz. It is not credible that Motorola is somehow "surprised."

3. Obviously, when the application recites 24 transponders with spacing of 29.12 MHz, simple mathematics results in 698.88 MHz. (See page II-7 of the Technical Section of the Application). The transponders alone are recited in the application as requiring 24 MHz bandwidth per transponder, which without any spacing at all would exceed 500 MHz ($24 \times 24 = 576$ MHz). (See Application at p. I-2 paragraph (4) stating "... 24 transponders of 24 MHz bandwidth..."). It is inconceivable that Motorola could ignore the basic math involved. The Order itself recites in paragraph 4 that there are 24 transponders requiring 24 MHz each (576 MHz without spacing) - yet Motorola argues "it didn't know" more than 550 MHz was being applied for? Preposterous.

4. The Application specifically states on page I-21:

"The satellite is designed to receive in the band 29.3 - 30.0 GHz and transmit in the band 19.5 - 20.2 GHz."

5. Further in the Application appearing on page I-23:

"The NorStar spacecraft will utilize 24 right-hand circularly polarized channels in the band 19,500 to 20,200 MHz. The corresponding spacecraft receive band is 29,300 to 30,000 MHz. Channels have a nominal bandwidth of 24 MHz with a spacing of 29.12 MHz between centers." (underlining added).

Does Motorola argue that "desire to operate" is different from "spacecraft will utilize"? If so, it is specious. Norris clearly "desired authority to utilize" these bandwidths.

6. Continuing with the specific references to 29.3 and 19.5, the Technical Showing at page II-1 states:

"The satellite is designed to receive in the band 29.3-30.0 GHz and transmit in the band 19.5-20.2 GHz."

7. Under Section 2.2.2 "Transponder Frequency and Polarization Plan" specific reference is to "channels in the band 19,500 to 20,200 MHz." Further in that section, the Application states that the "receive band is 29,300 to 30,000 MHz."

Those specific references refute Motorola's contention that it "searched in vain" for those references, unless Motorola's experts heads were buried in sand and never read the Application. It is Motorola's apparent contention that the Frequency Plan is an obscure document of small importance to the application, when in fact it is the very heart of the application. The Petition for Reconsideration referred to that Frequency Plan because it is so powerfully significant in the entire process. The Frequency Plan irrefutably recites the requested 700 MHz; it is dispositive.

Further in that same section, the Application states that the 24 transponders will have a "spacing of 29.12 MHz between centers." Multiplication confirms the request as being for 700 MHz, and Motorola can multiply. If not, then the specific figures of 19,500 and 29,300 provide specific notice that cannot be ignored.

8. Other references in the Application include Figure I-G; Part II, Figure 2, and page II-3, and II-6. Terrestrial interference is discussed on page I-26, with yet another statement that the utilized frequencies include down to 19.5 GHz and 29.3 GHz. Motorola's sole argument is that there is no indication of Norris' "desire to operate" in these frequencies. Unless there is an "operation" there can be no "interference." The Opposition is a specious word game exercise.

II. With regard to the PFD limits, attached is Norris' Exhibit 1 demonstrating that it meets the PFD limits. The Opposition is technically inaccurate and had they raised the question initially, the technical answer would have eliminated this issue in timely manner. This is actually a derivative issue. Once established that there was adequate notice of Norris' request for 700 MHz, Motorola's failure to file a Petition to Deny based on the PFD issue is equally eliminated. The fact that there is no PFD issue demonstrates that this entire Opposition is technically specious. A PFD challenge is ridiculous.

III. Motorola claims the waiver of financial qualifications is not appropriate for the entire 700 MHz bandwidth. The Commission has already ruled on this issue, and the reasoning

previously used applies equally here. The entire argument presumes that Motorola itself will obtain authority for 100 MHz from 19.5 - 19.6 which at this time has not been granted. It is a self-promotion for Motorola. Motorola is attempting to have the Commission accept as fact that Motorola has already obtained a license they do not have. Norris applied first, and has obtained a license. The logic of the Commission's waiver is based on the Application, and there is still no other FSS application on file. (See Order, footnote 17 and related reasoning in the Order).

Motorola argues that there is interference potential with its IRIDIUM system between 19.5 and 19.6 GHz. (Opposition at p. 4). Based on this argument Motorola jumps to the conclusion that Norris has "no financial qualifications" and could preclude a "financially qualified applicant" from using this band. All of the Commission's reasoning in granting the waiver are ignored in Motorola's argument. In addition, the technical capabilities and cost efficiencies of the services to be provided by NorStar I is also ignored by Motorola. Finances flow to cost efficiencies.

Motorola cannot deny that its Iridium satellites will not actually "utilize" the 100 MHz claimed to be an interference between 19.5 and 19.6 GHz. Instead, their real argument is that their low-tech, low power satellites require "extra protection" against interference in this margin even though Motorola will not use it. This argument by Motorola represents the worst technical argument that can be asserted: they seek exclusion of usage of a frequency merely because their system they are marketing is so

inefficient. This is contrary to the public interest. There is no need to review the Motorola application to rule on the financial qualifications of NorStar I, but their costs and efficiencies are swamped by the NorStar capabilities; NorStar I will launch and operate because it is so massively cost-effective that there is no way for its financial incentives to fail. The Commission agreed; the waiver was granted. A University that pays \$100 million to connect a fiber optic network (plus additional annual operational costs) cannot compete against the NorStar I cost of \$1/4 million annually for the same data transmission levels. The Commission's rulings are binding; it has properly waived financial issues.

Motorola acts as if its massive representation on each FCC working group, and its massive financial marketing program justifies the conclusion that the FCC should simply do whatever Motorola "applies for" even if not granted and even when it is not clear that it will ever be granted in the bandwidths suggested. Norris objects to inefficiency. Norris objects to requiring 200 MHz of irreplaceable frequency bands to remain unused merely because Motorola wants to design an inefficient system that it wants to have "buffered" and because they have a huge marketing campaign to convince private investors to put good money into inefficient technologies which will be obsolete if implemented.

Motorola seeks preferential treatment for its unlicensed low orbit "proposed" Iridium satellites over the higher orbit geostationary satellites such as NorStar I. The Motorola system - which is not approved - has the burden of proving that Motorola

will not interfere with the approved Norstar I. NorStar I is approved in geostationary.

Article 29, Sec. II in RR 2613 states in part:

"Non-geostationary space stations shall cease or reduce to a negligible level their emissions ... whenever there is insufficient angular separation between non-geostationary satellites and geostationary satellites."

The Motorola argument that their unlicensed system should be given precedence over a system that can provide business services for less than 1% of existing cost is hopelessly unpersuasive. NorStar I is the U.S. technological flagship.

The only reason to respond is because of Motorola's massive marketing capabilities, and massive representation on all FCC working groups. Norris and its related interests are prepared to deal with this agenda if necessary. Industrial America's "economies of scale" have been replaced by "economies of technological innovation." Norris is the cutting edge of technologic innovation, as is known by all involved technocrats, including those employed by Motorola. The financial realities are so dramatic that there is simply no rational argument against the financial capability of the Norris application.

The Commission has already ruled on the issue of waiver of financial qualifications, and it is not an issue in Norris' Petition for Reconsideration. As a matter of law, Norris contends that this issue is not a proper matter to even be considered. Even if it is, the merits of the Commission's findings and rulings on this issue apply to the entire 700 MHz of bandwidth.

IV. Motorola contends that Norris hasn't demonstrated a need for the entire 700 MHz requested. That argument is technically preposterous. NorStar I is the commercial follow-up to NASA's ACTS satellite which has already cost U.S. taxpayers \$1 Billion. Norris' assets are "at risk" without waiting for the ACTS results. NASA agrees that the NorStar I will utilize the frequencies at issue. Motorola argues to eliminate huge portions of Norris' business as recited in the business plan, including supercomputers.

Let us assume, **arguendo**, that Motorola is correct - no need for NorStar's services exist for the entire 700 MHz. The inevitable consequence is that there is no possibility for NorStar to provide the supercomputer transmission rates, and all the other leading countries will outstrip the United States. There is no other alternative. All other countries will be operating with satellite transmission of supercomputing technology at less than 1% of the cost for similar U.S. operations. The underlying reason for such a preposterous result would be that Motorola has a tremendous overhead of marketing personnel, marketing money, and FCC working group participants which improperly interfere with efficiency and international business realities. It is a future for the United States which makes the "S&L policy debacle" pale by comparison. One cannot deny objective technological innovation as represented by NorStar I and its progeny. The Business plan demonstrates the need. The "need" is not in question; the question is who will assume the risk, and the answer is Norris.

Respectfully submitted,

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May 27, 1993

Certificate of Service

I hereby certify that a copy of the foregoing Reply to Motorola's Opposition was mailed by first class mail, postage prepaid on this 28th day of May, 1993 to the following:

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ENGINEERING CERTIFICATION

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in the foregoing Reply to Opposition; that I am familiar with Parts 21 and 25 of the Commission's Rules and Regulations; that I have either prepared or reviewed the engineering information contained in the Reply; and that it is complete and accurate to the best of my knowledge and belief. This Certification applies with particularity to the attachment of Exhibit 1 to the Reply, which is the Power Flux Density limits exhibit.

Dated this 27th day of May, 1993.



Norris Satellite Communications, Inc.
By: Theo Mavromatis

**POWER FLUX DENSITY CALCULATIONS FOR NORSTAR I OPERATIONS IN
THE FREQUENCY RANGE OF 19.5 - 19.7 GHz (WORST CASE SCENARIO)**

a) EIRP @ beam center (dBW)	65
b) Energy dispersal @ 20 MHz (dB)	73
c) Conversion to 1 MHz (dB)	60
d) Downlink path loss (dB)	210
e) Gain of a sq. meter antenna @ downlink frequency (dBi/sq. meter)	47
f) Power flux density (dBW/sq. meter/ 1 MHz) (Note: $f = a - b + c - d + e$)	-111
g) ITU limit for elevation angles greater than 25 degrees (dBW/sq. meter/1 MHz) (Note: Smallest serviceable elevation angle > 25 degrees)	-105
h) Margin (dBW/sq. meter/1 MHz) (Note: $h = g - f$; Positive margin signifies compliance with ITU limits)	6