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May 21, 2001

**Ex Parte**

**VIA HAND DELIVERY**

Ms. Jane Mago  
General Counsel  
Federal Communications Commission  
The Portals  
445 Twelfth Street, S.W.  
Washington, D.C. 20554

Re: Response of MDS America to Allegations Filed May 9, 2001

Dear Ms. Mago:

I am writing to respond to the very serious allegations of "misrepresentation" aimed at MDS America, Incorporated ("MDS America") by Michael K. Kellogg, an attorney representing Northpoint Technology Ltd. ("Northpoint"), in a letter to you dated May 9, 2001.<sup>1</sup> MDS America submitted comments to the Commission on March 12, 2001<sup>2</sup> describing an innovative and proven wireless broadband technology in the Ku-band, that permits land-based broadcasters to share frequencies with satellite broadcasters, without interference. We believe that this technology, already in use internationally, has the potential to provide much needed competition in video and high-speed Internet data markets, including in rural and underserved areas. The benefits to consumers are potentially huge.

One competitor, Northpoint, erroneously claims to have recently invented the technology, and is trying to convince the Commission that it alone has the ability to offer the service in the United States and should be granted licenses, without being subject to competition, because of its

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<sup>1</sup> While the letter does not indicate that Mr. Kellogg was acting on behalf of Northpoint, we assume that he was doing so and will refer to the filing as the "Northpoint letter." Northpoint also issued Mr. Kellogg's letter to the press prior to its appearing on the FCC filing website. The copy of the letter served on MDS America by Northpoint was not received until May 14.

<sup>2</sup> MDS America filed its initial comments on this date in response to the *Further Notice of Proposed Rule Making*, ET Dkt. No. 98-206 ("Initial Comments"); its reply comments were filed April 5, 2001. MDS America filed an opposition to various petitions for reconsideration of the *First Report and Order* in the same matter, on April 24, 2001.

"unique" technology. In fact, however, another potential competitor, MDS America, the newly-formed U.S. licensee of MDSI International ("MDSI"), has access to a much superior and proven technology that has been operating for years in many parts of the world. MDS America has solid proof that MDSI's technology works as claimed, and has invited all the world to view a test in the United States under a recently granted experimental license from the Commission, as well as to visit MDSI's demonstration site at its headquarters near Lyon, France. The existence of the MDSI technology and its installations around the world completely undermine Northpoint's repeated claims to possess technology uniquely capable of operating in this sphere, and thus create the danger for Northpoint that its sustained multi-year lobbying campaign to be awarded licenses without facing competition or auctions will be defeated.

This is the context in which Northpoint's May 9 allegations were made. The letter is wrong in its central premise and contains major, easily verifiable, glaring errors that far exceed any minor inaccuracies in the MDS America filings.<sup>3</sup> The purpose of this correspondence is to present not only a rebuttal to these serious allegations, but to provide further clear proof that MDS America's essential representation, that the MDSI technology works as elegantly as claimed, is accurate.

Northpoint's central claim is that no installations of MDSI's terrestrial transmitters, "if they exist at all", share frequency with BSS or DBS satellites where they are located. This is flatly wrong, as shown below in detailed discussions of individual locations. The implication that MDSI's installations may not "exist at all" is particularly ludicrous. MDSI is a well-respected, highly-regarded company in the field of terrestrial broadband wireless systems. In fact, the International Telecommunication Union has written favorably about the possibility of using MDSI technology to supply Africa with television and Internet access service, in a report on the provision of communications infrastructure in Africa.<sup>4</sup> MDSI systems already operate in Cameroon and Gabon, countries we did not even mention in our original submission.

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<sup>3</sup> MDSI is not the "parent company" of MDS America as Northpoint's letter states; rather MDS America is the newly-formed United States licensee for MDSI. As a result, the information provided in MDS America's FCC filings regarding the worldwide installations of MDSI systems came from MDSI. MDSI itself develops technology and creates systems that it sells and usually, but not always, installs at customer sites. MDSI does not operate systems itself except for the demonstration site near Lyon. In a limited number of instances, this indirect transmission of information and the fact that MDSI is not an operator resulted in details of the operations of a few foreign systems unintentionally being reported incorrectly, as is discussed below. While we regret any error, these minor inaccuracies pale in comparison to the major errors contained in the Northpoint letter, and in no way contradict the central representations of MDS America to the Commission regarding the MDSI technology and its ability to co-exist with DBS satellites.

<sup>4</sup> International Telecommunication Union *"Support for Development of the Global Information Infrastructure in Africa"*, Telecom. Dev. Bur., Geneva, June 2000, at 57. See Exhibit 1.

Also attached is a letter from the Telecommunications Attaché of the Government of France, which coincidentally has purchased Ku-band equipment from MDSI.<sup>5</sup> Neither the equipment purchased by the French government or the test referenced by the Attaché (Ardeche County, France) were described in our earlier filings with the Commission. M. Combot makes it very clear in his letter that the French Embassy supports MDS America in its efforts to bring this innovative technology, invented and developed in France, with its potential to reduce the "digital divide" to the United States. His comments about deployment on a "large scale" speaks of the confidence the Attaché feels about this innovative technology.

The Northpoint letter's fallacious central claim itself is built on assumptions that are wrong in many key respects, including the following over-arching inaccuracies: (1) the letter claims that MDSI systems cannot share with DBS satellites in Europe in the 12.500 GHz to 12.750 GHz band because DBS has no allocation in this range in Europe, and thus our claims regarding the Lyon demonstration system, which operates in that band, are untrue. This is flatly wrong. There are a large number of direct-to-home channels available at 12.500 to 12.750 GHz throughout Europe;<sup>6</sup> (2) the letter claims that the Irish test conducted at 12.355 GHz could not have operated co-frequency with any DBS broadcast into Ireland because there are no DBS offerings at that frequency in Ireland. This is simply not true. There is substantial direct-to-home overlap with the 12.355 GHz band in Ireland;<sup>7</sup> and (3) the letter claims that the other MDSI installations in Europe could not have DBS overlap because they are offered in countries that do not offer Astra service. Once again the letter simply is wrong because it ignores the fact that a great many free (commercial supported) channels are available on Astra and are viewable even in countries that do not have pay service delivered by Astra available.<sup>8</sup> Northpoint also argues that a majority of satellite customers in Europe receive their video service via a cable system and cites Hot Bird as an example.<sup>9</sup> Yet Northpoint's own citation shows more than 23 million homes receiving direct satellite signals from Hot Bird alone. This contrasts to a total of approximately 15 million DBS customers in the United States. In addition, Astra has 38 million DTH/SMATV satellite reception customers in Europe.<sup>10</sup> Simply put, direct-to-home satellite is much more ubiquitous in Europe than in the United States. Therefore, European concern about interference with DBS should be, if anything, greater than in the United States. These major and glaring errors, as well as a host of smaller ones, totally eviscerate Northpoint's desperate claims of misrepresentation.

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<sup>5</sup> See Exhibit 2.

<sup>6</sup> See Exhibit 3.

<sup>7</sup> See Exhibit 4.

<sup>8</sup> See Exhibit 5.

<sup>9</sup> Northpoint letter n. 6.

<sup>10</sup> [www.ses-astra.com/satellites/coverage/covmarket.htm](http://www.ses-astra.com/satellites/coverage/covmarket.htm).

### The Lyon Demonstration Site

The first fundamental flaw in the Northpoint letter is the assertion that the MDSI demonstration site near Lyon "could not be operating co-frequency with any DBS or BSS satellite at this location" because no such satellites operate near the frequency used by the Lyon site.<sup>11</sup> The MDSI Lyon transmitter cited in MDS's comments has operated throughout the 12.500 to 12.750 GHz band. According to the Northpoint letter, there is no allocation to BSS or DBS in the 12.500 to 12.750 GHz band anywhere in Europe, let alone Lyon, and therefore there can be no interference issue in that band. This statement, viewed most charitably, is sadly misinformed.

Had Northpoint bothered to check any of the numerous TV provider websites in Europe, for example, it would have learned that in France, there are over a dozen free TV channels and one pay TV channel offered direct-to-home via satellite in the 12.500-12.750 GHz band on Astra alone.<sup>12</sup> These are:

| Free Channels       | Frequency (GHz) |
|---------------------|-----------------|
| Alice               | 12.6105         |
| BVN TV              | 12.5742         |
| Motors TV           | 12.6105         |
| N-TV                | 12.6695         |
| Nordlicht TV        | 12.551          |
| QVC                 | 12.551          |
| RTL Tele Lëtzebeurg | 12.551          |
| TV 5 Europe         | 12.6105         |
| TW 1                | 12.69255        |
| Video Italia        | 12.6105         |
| Viva                | 12.6695         |
| Viva 2              | 12.551          |
| Wish Line           | 12.6105         |

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<sup>11</sup> Northpoint letter at 4.

<sup>12</sup> See Exhibit 3.

| Pay Channel | Frequency (GHz) |
|-------------|-----------------|
| MTV Europe  | 12.699          |

Other channels in the 12.500-12.750 GHz band are offered by Hot Bird, and a large number of radio stations are offered in that band on both Astra and Hot Bird satellites.<sup>13</sup> Many other satellites also provide free programming in the 12.500-12.750 GHz band in European areas including Lyon.<sup>14</sup>

The listing from the Astra website (coincidentally referenced by Northpoint in its letter)<sup>15</sup> presumably should be sufficient to convince Northpoint that DBS channels are available in Lyon in the 12.500 to 12.750 GHz band. The listing is generated by specifying channel listings available in France from Astra at the Astra website.

The question of possible interference remains. The relevant facts here are that in Lyon, MDSI operates a broadcast tower on which satellite TV signals are received on one dish and rebroadcast using its terrestrial equipment 10 meters above on the same tower. The transmitter on that tower cited in MDS' comments is an agile transmitter that can broadcast from 12.500 to 12.750 GHz and regularly varies the broadcast frequency. Most recently it has retransmitted at 12.645 GHz. Within the past week, MDSI has tested using DBS signals received at both 12.6105 GHz and 12.6695 GHz and has retransmitted them using the 12.645 GHz frequency.<sup>16</sup> MDSI has then received the rebroadcast transmission bounced back to the tower location without interference to the received DBS signal, as evidenced by a clear digital TV picture from the terrestrially rebroadcast signal and a bit error rate of the received DBS signal of less than 1E-7.<sup>17</sup>

The excellent results from the Lyon demonstration system were attested to by a recent visitor, Eric Andersen of Conax, whose parent company is the third largest satellite operator in Europe:

I was amazed by the quality of reception and performance of what I saw. Being demonstrated was the Hypercable system from MDS in conjunction with set-up-boxes (STBs) from Xcom. The solution was based on

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<sup>13</sup> See Exhibits 3 and 6.

<sup>14</sup> See Exhibit 7.

<sup>15</sup> Northpoint letter n 7.

<sup>16</sup> See Exhibit 8, Blond Declaration.

<sup>17</sup> *Id.*

rebroadcasting digital MPEG2 transmissions from Astra satellite through the wireless system and received by using only the LNB from a satellite dish as input to the STB.<sup>18</sup>

In addition to the transmitter currently using the 12.645 GHz frequency, MDSI recently has been testing three additional transmitters on this tower which are about to be shipped to Malaysia for a new system there. Those transmitters have used the 10.7195, 10.7975 and 10.8755 GHz frequencies.

While MDSI has dispatched LCC International engineers to Lyon to make an independent determination of whether there is interference caused by that site, and while MDSI and MDS America have invited all interested parties to come to Lyon to observe the site, MDS America also can perform a real time interference test, for the Commission or other interested parties, monitorable over the Internet. By simply using a laptop computer with a browser, someone with access to the site can monitor and change the DBS transport stream received at the tower and then see whether it is interfered with when it is rebroadcast by the MDSI transmitters and bounces back and is re-received within ten meters of the tower location. The monitoring equipment shows the bit error rate (BER) of the received DBS signal in real time.

**The MDS America Technology Most Recently  
Passed Rigorous "Worst Case" Tests in Ireland**

Northpoint commits another puzzling error when it claims the six month test in the area of Cork, Ireland as evidence of MDS America's "misrepresentations." Contrary to the Northpoint letter's claims, the test was performed at a frequency which directly overlapped significant direct-to-home broadcasts on both its upper and lower bands.

Attached hereto as Exhibit 4 is a report of a series of tests by an independent engineering firm hired not by MDSI, but by SCTV in Ireland, which is an MDSI prospective customer. MDSI thus did not pay for this test. Instead, the test was paid for by the prospective customer as part of a due diligence effort before deciding to purchase.

According to the report, SCTV tested MDSI equipment initially for a six month period beginning in July 2000 in the Cork region. The MDSI equipment broadcast digital program services using a Hypercable MDSI transmitter on a frequency of 12.355 GHz. The MDSI transmitter shared a frequency spectrum used for satellite broadcasts of numerous pay and free TV direct-to-home services.

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<sup>18</sup> See Exhibit 9.

According to the report, the satellite broadcasts included Astra 1H direct broadcast satellite programs, at a frequency of 12.363 GHz, that were available free in Ireland. At the time of the test, the Astra 1H programs being broadcast were TV5 (French), RAI (Italian), DW (English/German news), RTM (Morocco), TV7 (Tunisia), and Egypt TV.<sup>19</sup>

In addition, the Astra 2A satellite was broadcasting English language programs, at a frequency of 12.363 GHz, that were available to pay TV customers in the area. They included 18 + Movies 1 and 2, Hallmark Entertainment, National Geographic Channel + 1, Nickelodeon, Replay, Sky Box Office channels 54, 55, 56, 57, and 58, Sky Business and Star Plus.<sup>20</sup>

Also, Eutelsat was broadcasting programs at a frequency of 12.341 GHz, including Sky News, which is a free English language channel that is widely viewed in Ireland.<sup>21</sup>

The report states that "no complaints of interference into home satellite receivers were reported." Test company engineers analyzed approximately 200 receive test points and recorded 95 spot measurements at distances from zero (base of broadcast tower) out to 35 kilometers. The report states "[w]e never observed any interference to or from the satellite signals during any of these tests."<sup>22</sup>

The report states that test engineers created specific "worst case" tests for interference into direct-to-home receivers. The report states that "[n]o trace of the [MDSI] Hypercable signal could be found on the spectrum analyzer and no disturbance to the satellite reception was observed." The "worst case" test was conducted at both three kilometers and directly under the transmission tower and no interference "could be measured or observed." The report also states that no complaints of interference were received "even though thousands of Sky Digital DBS receivers are working in the vicinity of the test transmitters."<sup>23</sup>

This test description, the product of work done by a totally objective source, an independent engineering consulting firm hired by a prospective customer to evaluate the suitability of the MDSI system, could hardly be more conclusive evidence as to the validity of the core claim made by MDS America to the Commission: *MDSI systems can co-exist with DBS*

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<sup>19</sup> See Exhibit 4.

<sup>20</sup> *Id.*

<sup>21</sup> *Id.* MDS America's Initial Comments did not mention the Eutelsat programs. As we noted then (n.1 at 10), there exist many more DBS satellites that overlap with MDS installations than are listed in the appendices to the Initial Comments. Those listed were meant to be illustrative only.

<sup>22</sup> *Id.*

<sup>23</sup> *Id.*

*satellites without creating harmful interference.* It is worth noting here that the test results of the MDSI system were spectacularly better than those found by MITRE when testing the Northpoint system.

The O’Gorman report also demolishes conclusively Northpoint’s unfounded claim that MDS America misrepresented the Irish situation. In fact, it is Northpoint’s claim that “a test at this frequency (12.355 GHz) could not have operated co-frequency with any DBS broadcast into Ireland” that is erroneous.<sup>24</sup> However, again, unlike Northpoint, we will give them the benefit of the doubt and simply call their assertions mistaken.

One other point relating to Ireland is worthy of note. Northpoint says that the French Canal programming on Astra at 12.363 GHz is not available in Ireland, so there could be no overlap.<sup>25</sup> But as the report of Mr. O’Gorman notes, during his test period, six free channels were available on that frequency on Astra 1H. Subsequently they were replaced by the Canal Digital Program. We were informed by a large satellite operator that such channel changes are not an infrequent occurrence.<sup>26</sup> Thus, a frequency where there is satellite-terrestrial overlap one day may not have such an overlap the next day or vice-versa. Those who wish to make charges of misrepresentation should bear this fact in mind.

MDS America is currently conducting similar baseline testing in Lyon, France. These tests also are being done by an independent contractor. MDS America plans to conduct similar tests in the United States pursuant to its experimental license.

### **New Zealand**

Northpoint claims, erroneously, that only one of the Optus satellite transponders listed in MDS America’s Initial Comments is broadcast to New Zealand, one of the locations having MDSI terrestrial broadcasting equipment.<sup>27</sup>

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<sup>24</sup> Northpoint letter at 3.

<sup>25</sup> *Id.*

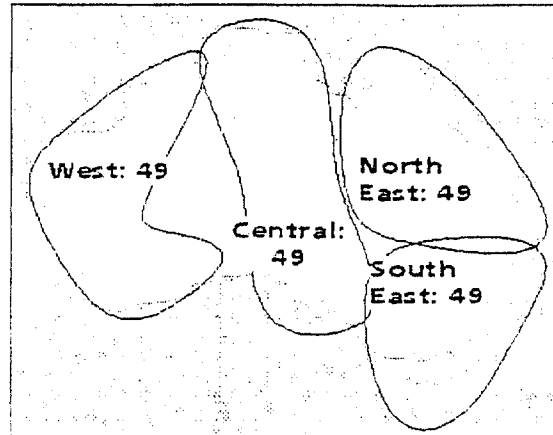
<sup>26</sup> *See* Exhibit 8.

<sup>27</sup> Northpoint letter at 2.



The chart listed below was an exhibit to the Northpoint letter used to illustrate this point. Curiously, it does not indicate which Optus satellite (B1 or B3) transponder this footprint shows.

Exhibit 2 Optus Footprint does not cover New Zealand



However, the following is another Optus transponder footprint map, one easily available over the Internet, but which Northpoint did not file:



Clearly, Northpoint has omitted facts that do not support its position or, at the very least, has made claims of misrepresentation cavalierly. To verify the information originally supplied to

us by MDSI, MDS America went to websites covering DBS satellites and programming available in the South Pacific region and followed that up by contacting Cable & Wireless Optus itself.<sup>28</sup> In fact, all Optus B1 and B3 transponders broadcasting on vertical polarization cover New Zealand, according to Cable & Wireless Optus.<sup>29</sup>

Because, clearly, there is substantial Ku-band satellite coverage of New Zealand, the next issue is whether there are any DBS operators in New Zealand. In fact, approximately 224,000 paying Sky Television customers in New Zealand receive Optus B1 satellite broadcasts on 39 channels.<sup>30</sup> Had Northpoint bothered to either check Sky Television's website, called Sky TV New Zealand as we did, or check the Lyngemark satellite chart for Optus B1, this fact could have been easily confirmed.<sup>31</sup>

In addition, Zee TV Australia/New Zealand could have informed Northpoint of their paying customers in New Zealand.<sup>32</sup> The Zee TV broadcast is being received via the Optus B3 satellite as the attached channel line up shows.<sup>33</sup> In addition, we are informed by Sky Racing in Australia that until earlier this year, there was a Sky Racing Channel feed broadcast at a frequency of 12.407 GHz on the Optus B3 satellite in New Zealand.<sup>34</sup> That they are not currently doing so is just another example of how often the frequencies issued change.

Northpoint asserts that MDS America "*claims* its equipment is used to provide service in a *portion of* Auckland," New Zealand (emphasis added). If any doubt existed, use of nearly any Internet search engine with the name of the MDSI customer, IHUG, listed in our Initial Comments, and the country, New Zealand, would have led to the customer's website. IHUG offers both television and Internet service from two separate transmitters in the city of Auckland,

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<sup>28</sup> See Exhibit 8.

<sup>29</sup> *Id.* MDS America's Initial Comments listed illustrative vertical and horizontal transponders in our New Zealand discussion. It now appears that only the vertical transponders are relevant to New Zealand; however, as explained earlier, our list was meant to be illustrative and not comprehensive, so we did not list many Optus vertical transponders that have a New Zealand footprint. In addition, PAS 8, which we originally indicated covered New Zealand, does so, but apparently only on its C-band transponders, not its Ku-band transponders. However, PAS 2, another DBS satellite, has a footprint covering New Zealand. See Exhibit 10.

<sup>30</sup> See Exhibit 11.

<sup>31</sup> See Exhibits 8, 10 & 11. The Lyngemark Optus B1 chart in Exhibit 10 was also included in Table 3.1 to Appendix 2 of MDS America's Initial Comments.

<sup>32</sup> See Exhibits 8 and 12.

<sup>33</sup> See Exhibit 13.

<sup>34</sup> See Exhibits 8 and 13.

the most populous area of the country, with a population of more than one million.<sup>35</sup> In fact, one of the IHUG transmitters is on the Skytower in Auckland, the tallest tower in the Southern Hemisphere, according to Auckland's website.<sup>36</sup> The IHUG website confirms this information.<sup>37</sup> We have included a print-out of the IHUG coverage map.<sup>38</sup>

Satellite broadcasters routinely change broadcast frequencies within their authorized bandwidth. Any terrestrial broadcaster operating within that bandwidth that interfered with satellite broadcasters on these frequencies would quickly be discovered by the satellite broadcasters. IHUG, operating MDSI equipment, has been broadcasting in the Optus authorized bandwidth for some time. In addition, MDSI terrestrial transmitters may be reset to vary their frequency. According to an e-mail from IHUG, it broadcasts at 12.266 and 12.480 GHz<sup>39</sup>. Thus, whether the user changed the frequencies, or the initial information from MDSI was inaccurate, the overlap discussion in our Initial Comments is not relevant to the current IHUG transmission frequencies. Today, however, at 12.518 GHz, the Optus B1 satellite is currently broadcasting direct to home the entire Sky TV New Zealand bouquet of channels to almost a quarter of a million customers,<sup>40</sup> quite close to the IHUG 12.480 GHz frequency.

### **Almaty, Kazakhstan**

The Kazakhstan transmitter's range is from 12.500 to 12.750 GHz<sup>41</sup>. There are numerous DBS satellites with footprints covering Kazakhstan in that range carrying both freely viewable channels and feeds.<sup>42</sup> Northpoint's Exhibit 4 claims that the Eurasiasat 1 satellite we cited in our Initial Comments "is FSS, not BSS and its operations stop at 12750 ..."<sup>43</sup> Neither of these statements appears to be true. Eurasiasat's website specifically says it offers both BSS and FSS service, and frequencies of above 12.500 GHz are listed for Eurasiasat 1 by Satco.<sup>44</sup>

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<sup>35</sup> [www.aucklandnz.com/about.shtml](http://www.aucklandnz.com/about.shtml).

<sup>36</sup> *Id.*

<sup>37</sup> [www.IHUG.co.nz](http://www.IHUG.co.nz).

<sup>38</sup> See Exhibit 14.

<sup>39</sup> See Exhibit 15.

<sup>40</sup> See Exhibit 11.

<sup>41</sup> See Exhibit 8. MDSI had originally indicated that the Kazakhstan equipment operated at 12.750 to 12.775 GHz. We were not able to reach the operator to ascertain its current frequencies prior to filing this response.

<sup>42</sup> See Exhibit 16.

<sup>43</sup> Northpoint Letter, Exhibit 4.

<sup>44</sup> See Exhibit 16.

### Andorra

Northpoint states that "MDS offered few details about its Andorran installation." Let us add some. The MDSI customer happens to be the state television service of Andorra which uses a four transmitter system operating from two sites to relay its UHF/VHF television signals by using repeaters and reflectors. The signal moves between mountains to the final destinations of the UHF/VHF broadcast system in Andorra. The transmitters were sold and configured to use the following frequencies: 11.8485 GHz, 11.9075 GHz, 11.9665 GHz and 12.0255 GHz, according to MDSI.<sup>45</sup>

Northpoint claims "Astra does not offer service to Andorra".<sup>46</sup> However, as we discussed earlier, there are many, many free channels available in Europe. Exhibit 17 lists free channels available in Spain from nine satellites. Astra, in its free programming to Spain lists many channels that are very close to the MDSI system operating frequencies.<sup>47</sup>

### Macedonia

Northpoint's claim here is that MDS America's citation does not cover the region where MDSI's system operated. It is not entirely clear what Northpoint is arguing since the text of its letter refers to Astra 1F, but the footnote references Astra 1G<sup>48</sup>. MDS America had cited Astra 1F not for Macedonia, but for other European countries with MDSI systems. In any event, Astra 1G, 1H, 2A, and 2B cover either all of Macedonia<sup>49</sup> or, at a minimum, the Skopje region where MDS International's system operated<sup>50</sup>. For ease of reference we have included maps of both Europe and Macedonia<sup>51</sup>. The MDSI system in Skopje clearly appears to be within the footprint of 1G.

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<sup>45</sup> See Exhibit 8. MDSI actually has sold two systems in Andorra to separate customers. The frequency reported in our Initial Comments, 12.08455 GHz was for another Andorran customer and was not the system sold to the state television authority.

<sup>46</sup> Northpoint letter, at 4.

<sup>47</sup> See Exhibit 17. The Astra Spanish line up is 8 pages long and includes over 80 free to air channels. In addition, we are told that large numbers of Andorrans subscribe to various pay TV packages. See Exhibit 8.

<sup>48</sup> See Northpoint letter, Note 7.

<sup>49</sup> Exhibit 18.

<sup>50</sup> After contacting MDS International in France, MDS America was informed that the Macedonian system is no longer serving in a direct-to-home configuration but now serves as a mobile feed system.

<sup>51</sup> See Exhibit 19.

Northpoint's statement that "Hot Bird 2, broadcasts on the 'superbeam' whose focus it (sic) over Western Europe and has insufficient strength over Macedonia to provide DBS service," is not supported by satellite maps. MDS America has included views of the Hot Bird superbeam coverage from three sources. These views reveal a satellite footprint ranging from directly over Macedonia to merely covering Macedonia. Of course, the widebeam clearly covers all of Macedonia. Thus the question of which Hot Bird transponders cover Macedonia is moot; they all cover Macedonia.<sup>52</sup>

### **Serbia**

Northpoint claims that "as Astra's website makes clear, Astra does not offer services in Serbia." It is simply wrong, again.<sup>53</sup> The Astra 1G satellite which covers all of Serbia with a 120 cm disk (M) is currently broadcasting multiple free channels in German, a language widely spoken in the Balkans, including Euronews and Eurosports at 11.9535 GHz<sup>54</sup> MDSI reported to us that its customer was transmitting at 11.907 GHz. Our updated information is that the system has always been used for testing and educational purposes conducted by the "Elektonski Fakultet" of the University of Nis, not for commercial purposes as we originally thought. Despite the difficult political situation in Serbia the system is currently running and broadcasting.<sup>55</sup>

### **Korea**

Northpoint notes that because MDS America did not identify in its filing where in Korea MDSI equipment had been tested, it was unable to comment on whether the Korea system matched a satellite footprint. Had they bothered to ask us, we could have told them that the MDSI land-based equipment was tested in Seoul. While Northpoint correctly understood that the system in Korea was a test, we note that due to a misinterpretation of MDSI data, our filings also listed the Korean system as commercial. We are seeking further information relating to the duration of the Korean test.

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<sup>52</sup> See Exhibit 20.

<sup>53</sup> See Exhibit 6.

<sup>54</sup> See Exhibit 21.

<sup>55</sup> See Exhibit 8.

### Press Release Note

Northpoint attempts to make much of a footnote describing MDSI at the bottom of a press release, which states that MDSI "currently uses the shared 12.2-12.7 GHz band to offer video and high-speed data services to subscribers in more than 20 international markets." MDSI is not an operator and has no subscribers itself, so the footnote, which was not part of the body of the release, and was corrected in subsequent press releases, is inaccurate. However, the quoted statement, while regrettable, was not made to the Commission and therefore is irrelevant to Northpoint's letter to the Commission. MDS America contacted MDSI to verify that the references to MDSI systems around the world made in our filings before the Commission were correct, and we were informed, consistent with those filings, that: MDSI has sold more than a score of systems; the overwhelming majority of MDSI installations operate on the Ku-band; and most of these systems were installed or shipped to locations with DBS service. Because MDSI is not an operator, the current system operational status or usage could not be verified in every instance.<sup>56</sup>

\* \* \*

A tremendous volume of information is available on the Internet relating to satellite systems, some of it conflicting. We submit that before Northpoint launched widespread accusations of misrepresentation, a simple phone call to MDS America would have been warranted and would have saved Northpoint much embarrassment. We could have shown that a few clicks of the mouse would have led to such basic information as a database of satellite TV signals broadcast in Europe in the 12.500 to 12.750 GHz band, or a map of New Zealand with the Optus satellite footprint. No doubt Northpoint will respond to this letter. If it is thinking of any new accusations, my phone number is listed above.

We trust that we have convincingly responded to the central charge made by Northpoint, that MDSI systems do not successfully share spectrum with DBS services, as well as the remainder of Northpoint's charges. In the course of verifying the information earlier supplied to us, we have found a limited number of discrepancies, which we have described above and corrected based on information now available to us. Of course, we regret any inaccuracies in a filing because we take our responsibility to the Commission seriously, but we must emphasize that none of the limited discrepancies found detract from MDS America's central representation to the Commission: MDSI systems can and do co-exist successfully with Ku-band satellite systems in locations around the world. The inaccuracies in Northpoint's accusations on the other hand, are far more glaring and relevant to the central issue being debated. However, MDS America does not believe it would be productive to call for an investigation of Northpoint. Rather, we would suggest that all parties concentrate their attention cooperatively, on dealing

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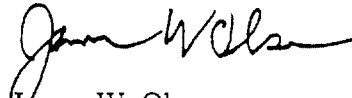
<sup>56</sup> See Exhibit 8. We also learned during our verification that for the Oman system, while the sales effort took place in 1996, the shipment and installation was actually in 1997.

with the remaining issues involved in sharing spectrum among three services, issues which if resolved successfully, will have enormous public interest benefits and positive implications for future spectrum usage.

We would be pleased to meet with or otherwise respond to any comments or questions that you or other Commission personnel might have regarding this matter.

Thank you for your attention.

Sincerely,

A handwritten signature in dark ink, appearing to read "James W. Olson". The signature is fluid and cursive, with the first name "James" being more prominent and the last name "Olson" following in a similar style.

James W. Olson

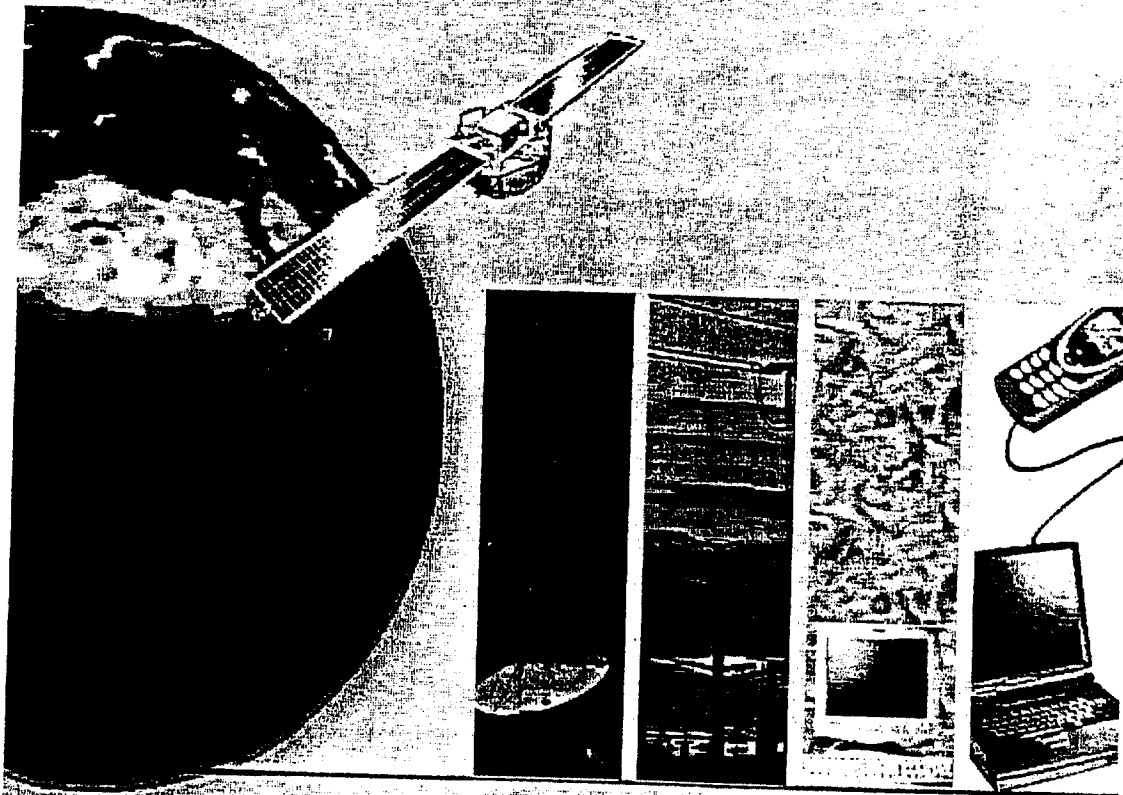
Enclosures

**Exhibit 1**  
**Relevant Pages from the ITU's "Support for the  
Development of the Global Information Infrastructure  
in Africa" (pages 57 – 58)**





## Support for Development of the Global Information Infrastructure in Africa



### Guide on Managing and Developing Network Connections and Interconnections to the National Internet Nodes

Prepared by Désiré Karyabwite  
Consultant in Internet Nodes Management

International  
Telecommunication  
Union



Telecommunication  
Development Bureau  
(BDT)

Geneva, June 2000

### *5.6.5 Microwave Multipoint Distribution System (MMDS)*

#### *5.6.5.1 General remarks*

Television cable which could be used for high-speed Internet is a rarity in Africa. One worthwhile and less costly alternative is to use digital transmission over **MMDS** (Microwave Multipoint Distribution System), regarded as the cable system for rural areas. MMDS is a method of broadcasting analogue or digital television programmes by means of microwave or hyperfrequencies. Amplitude modulation can be used or, better still, frequency modulation, used by direct television satellites. This wireless access to the local network can be used for Internet. A further possibility exists in the form of systems covered by the European **DECT** (Digital European Cordless Telephone) standard.

#### *5.6.5.2 MMDS as an alternative to television cable*

The operator can receive selected television programmes from various satellites using head-end dish antennae, and redistribute them using a Hypercable transmitter. All that then needs to be done is to equip users (individually or collectively) with a 10 cm active mini-antenna (within 30 km of the transmitter - the range rises to 100 km with a 28 cm antenna) and a satellite TV receiver. No civil engineering work is involved, there are no wires to be pulled out, installation times are short and the environmental impact is low owing to the small size of the receivers. Originally invented for television, MMDS would appear to offer a worthwhile alternative to cable in Africa.

The legislation in the different countries will need to be amended to accommodate this option, which in some European countries is permitted only for extensions to a cable network in rural areas, or for transport at the end of a cable network from the main artery (cable) to households. MMDS is also an option for high-speed multimedia data transmission, which can be used for Internet access.

#### *5.6.5.3 Internet access using MMDS*

Taking as a model the case of Mexico, where a single network serves around 400 000 subscribers, MMDS technology could also be used in Africa for connecting to the Internet. In order to use MMDS for connection to the Internet, an **IRS** (Internet Radio Server) is installed beside the transmitter. This is a microcomputer connected up to the local network of the Internet services provider, which converts the signal to the MPEG2/DVB standard, for transmission via the Hypercable antenna (MDS-France architecture). In addition to an antenna, the Internet subscriber must have a PC card incorporating a satellite receiver (which can receive data at 2 Mbit/s, 4 Mbit/s, 8 Mbit/s or 15 Mbit/s), as well as a standard browser and a PSTN or GSM modem or an ISDN adapter for the backward channel. As the technology stands, MMDS operates in one direction only, and the user-to-server dialogue must use a different path. A new 2 Mbit/s bidirectional system is expected to be launched.

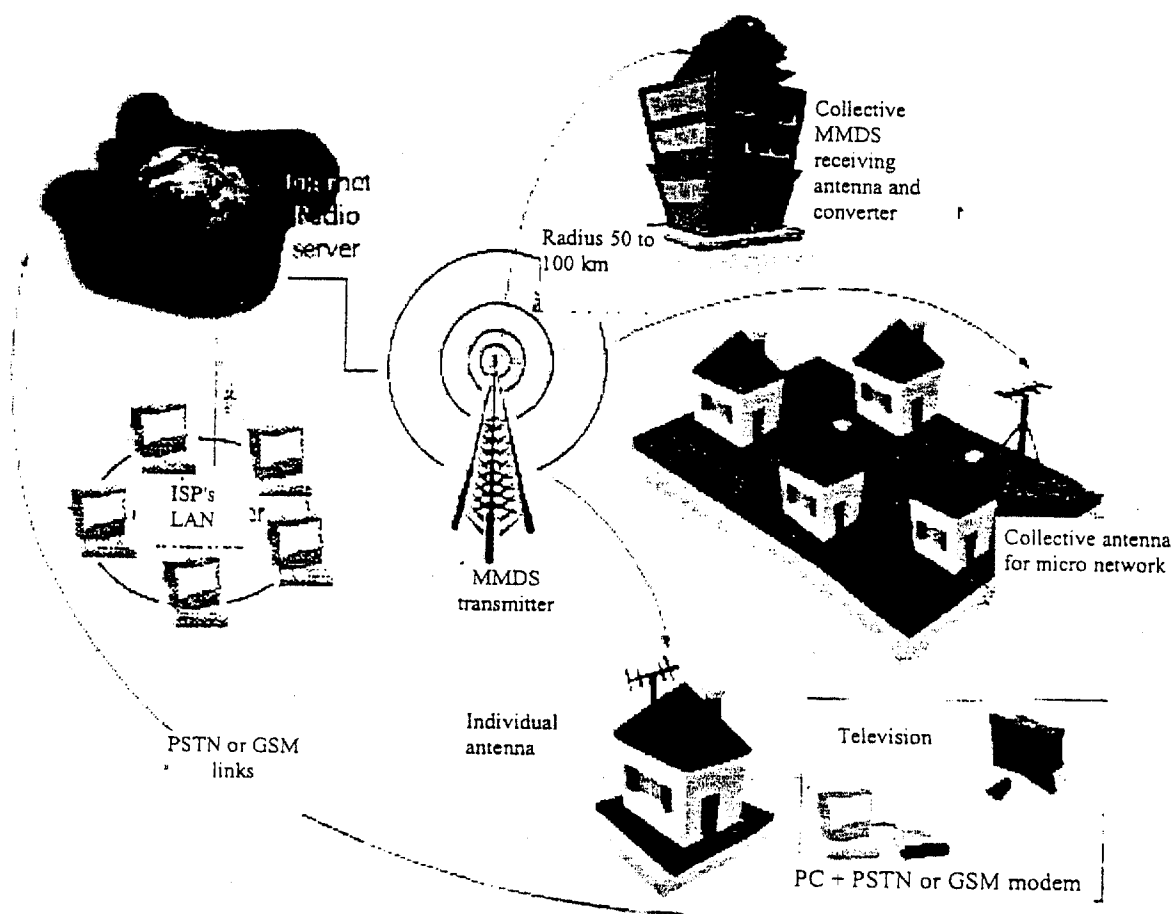


Fig. 5.6 MMDS Internet network (Source: MDS-France)

**Exhibit 2**  
**Letter from the telecommunications Attaché of**  
**Embassy of France in the United States**



EMBASSY OF FRANCE IN THE UNITED STATES  
ECONOMIC AND COMMERCIAL AFFAIRS  
THE MINISTER COUNSELOR

Washington, Thursday, May 17, 2001

M. Kirk Kirkpatrick  
MDS America  
CEO  
16605 E. Palisades Blvd. #124  
Fountain Hills, AZ 85268

Dear M. Kirkpatrick,

As a representative of the French government and the French Trade Office in Washington, DC, USA, I would like to take the opportunity to support MDS International's efforts regarding developing its business in the United States related to broadband wireless transmission.

Following the creation of MDS in France by M. Ducasse in the suburbs of Lyons a few years ago, your company did well in selling products in France, for example a Point-to-Multipoint (PMP) system to the French government.

Your products, especially your Hypercable technology related to Internet access through terrestrial broadcast in the 12.2 to 12.7 GHz band, are representing a solution to reduce the so-called digital divide. The experiment conducted by the Ardeche County in France using MDS's technology is clearly demonstrating that this system could be deployed on a large scale.

The creation of subsidiaries of MDS International in the United States and in Asia shows MDS' strong commitment to develop its business on a worldwide basis and I fully support this effort of exporting French expertise and technology.

Best Regards.

  
Michel COMBOT

Telecommunications Attache

Exhibit 3  
**Astra Channel Availability listing for France**

## Digital TV Services

\* Free conditional reception. Service is encrypted but free of charge. Equipment and smart card required for encoding.

\*\* Reception depends on the ASTRA footprints. Please check if this service is available at your location (corresponding to your dish size) by clicking on the transponder number.

| Channel Name    | Package        | Type                  | Received in **                   | Transponder (Bitrate, FEC)     | Satellite    |
|-----------------|----------------|-----------------------|----------------------------------|--------------------------------|--------------|
|                 | Encryption *   | Genre                 | Language(s)                      | Freq. / Pol.                   | Orbital Pos. |
| 13ème rue       | CanalSatellite | TV                    | France                           | <u>Trp 100</u><br>(27500, 3/4) | ASTRA-1H     |
| 3sat            | Pay TV         | Films                 | French                           | 12.402 GHz / V                 | 19.2°E       |
|                 | -              | TV                    | ASTRA reception area             | <u>Trp 77</u> (27500, 3/4)     | ASTRA-1G     |
| AB 1            | Free           | Culture               | German                           | 11.9535 GHz / H                | 19.2°E       |
|                 | CanalSatellite | TV                    | France                           | <u>Trp 93</u> (27500, 3/4)     | ASTRA-1H     |
|                 | Pay TV         | General Entertainment | French                           | 12.2655 GHz / H                | 19.2°E       |
| AB Moteurs      | CanalSatellite | TV                    | ASTRA reception area             | <u>Trp 93</u> (27500, 3/4)     | ASTRA-1H     |
|                 | Free           | Automobile            | French                           | 12.2655 GHz / H                | 19.2°E       |
| ABsat           | CanalSatellite | TV                    | ASTRA reception area             | <u>Trp 93</u> (27500, 3/4)     | ASTRA-1H     |
|                 | Free           | Promo                 | French                           | 12.2655 GHz / H                | 19.2°E       |
| Alice           | -              | TV                    | ASTRA reception area             | <u>Trp 112</u><br>(22000, 5/6) | ASTRA-1H     |
|                 | Free           | General Entertainment | Italian, French, English, German | 12.6105 GHz / V                | 19.2°E       |
| Allo Cine TV    | CanalSatellite | TV                    | France                           | <u>Trp 66</u> (27500, 3/4)     | ASTRA-1G     |
|                 | Pay TV         | Films                 | French                           | 11.7395 GHz / V                | 19.2°E       |
| Andalucia TV    | -              | TV                    | ASTRA reception area             | <u>Trp 76</u> (27500, 3/4)     | ASTRA-1F     |
|                 | Free           | General Entertainment | Spanish                          | 11.934 GHz / V                 | 19.2°E       |
| Animaux         | CanalSatellite | TV                    | France                           | <u>Trp 93</u> (27500, 3/4)     | ASTRA-1H     |
|                 | Pay TV         | Documentary           | French                           | 12.2655 GHz / H                | 19.2°E       |
| ARD - Das Erste | -              | TV                    | ASTRA reception area             | <u>Trp 71</u> (27500, 3/4)     | ASTRA-1G     |
|                 | Free           | General Entertainment | German                           | 11.8365 GHz / H                | 19.2°E       |
| ARTE            | -              | TV                    | ASTRA reception area             | <u>Trp 54</u> (.)              | ASTRA-1E     |
|                 | Free           | Culture               | French                           | 10.788 GHz / V                 | 19.2°E       |
| arte            | -              | TV                    | ASTRA reception area             | <u>Trp 71</u> (27500, 3/4)     | ASTRA-1G     |
|                 | Free           | Culture               | German                           | 11.8365 GHz / H                | 19.2°E       |
| ASTRA-Mosaic    | -              | TV                    | ASTRA reception area             | <u>Trp 108</u><br>(22000, 5/6) | ASTRA-1G     |
|                 | Free           | Promo                 | Various                          | 12.551 GHz / V                 | 19.2°E       |

|                                                        |                |                       |                                   |                                |          |
|--------------------------------------------------------|----------------|-----------------------|-----------------------------------|--------------------------------|----------|
| <b>ASTRA-Vision</b>                                    | -              | TV                    | ASTRA reception area              | <u>Trp 108</u><br>(22000, 5/6) | ASTRA-1G |
|                                                        | Free           | Promo                 | Eng.,Spa.,Fre.,Ger.,Ital.,NL,Pol. | 12.551 GHz / V                 | 19.2°E   |
| <b>B1</b>                                              | -              | TV                    | ASTRA reception area              | <u>Trp 85</u> (27500, 3/4)     | ASTRA-1G |
|                                                        | Free           | General Entertainment | German                            | 12.1095 GHz / H                | 19.2°E   |
| <b>Bayerisches Fernsehen</b>                           | -              | TV                    | ASTRA reception area              | <u>Trp 71</u> (27500, 3/4)     | ASTRA-1G |
|                                                        | Free           | General Entertainment | German                            | 11.8365 GHz / H                | 19.2°E   |
| <b>BBC World</b>                                       | CanalSatellite | TV                    | France                            | <u>Trp 93</u> (27500, 3/4)     | ASTRA-1H |
|                                                        | Pay TV         | News                  | English                           | 12.2655 GHz / H                | 19.2°E   |
| <b>Bloomberg TV</b>                                    | CanalSatellite | TV                    | France                            | <u>Trp 70</u> (27500, 3/4)     | ASTRA-1G |
|                                                        | Pay TV         | Business              | French                            | 11.817 GHz / V                 | 19.2°E   |
| <b>Bloomberg TV</b>                                    | -              | TV                    | ASTRA reception area              | <u>Trp 108</u><br>(22000, 5/6) | ASTRA-1G |
|                                                        | Free           | Business              | German                            | 12.551 GHz / V                 | 19.2°E   |
| <b>BR-alpha</b>                                        | -              | TV                    | ASTRA reception area              | <u>Trp 71</u> (27500, 3/4)     | ASTRA-1G |
|                                                        | Free           | Education             | German                            | 11.8365 GHz / H                | 19.2°E   |
| <b>BVN TV - Het Beste van Vlaanderen en Nederlands</b> | Canal Digitaal | TV                    | ASTRA reception area              | <u>Trp 109</u><br>(22000, 5/6) | ASTRA-1G |
|                                                        | Free           | General Entertainment | Dutch                             | 12.5742 GHz / H                | 19.2°E   |
| <b>Canal 99</b>                                        | CSDigital      | TV                    | ASTRA reception area              | <u>Trp 76</u> (27500, 3/4)     | ASTRA-1F |
|                                                        | Free           | Promo                 | Spanish                           | 11.934 GHz / V                 | 19.2°E   |
| <b>Canal Canarias</b>                                  | CSDigital      | TV                    | ASTRA reception area              | <u>Trp 102</u><br>(27500, 3/4) | ASTRA-1F |
|                                                        | Free           | Travel                | Spanish,English,German,French     | 12.441 GHz / V                 | 19.2°E   |
| <b>Canal Evènement</b>                                 | CanalSatellite | TV                    | France                            | <u>Trp 80</u> (27500, 3/4)     | ASTRA-1E |
|                                                        | Pay TV         | Culture               | French                            | 12.012 GHz / V                 | 19.2°E   |
| <b>Canal J</b>                                         | CanalSatellite | TV                    | France                            | <u>Trp 68</u> (27500, 3/4)     | ASTRA-1G |
|                                                        | Pay TV         | Children              | French                            | 11.778 GHz / V                 | 19.2°E   |
| <b>Canal Jimmy</b>                                     | CanalSatellite | TV                    | France                            | <u>Trp 70</u> (27500, 3/4)     | ASTRA-1G |
|                                                        | Pay TV         | General Entertainment | French                            | 11.817 GHz / V                 | 19.2°E   |
| <b>Canal Plus</b>                                      | Canal Plus     | TV                    | France                            | <u>Trp 72</u> (27500, 3/4)     | ASTRA-1G |
|                                                        | Pay TV         | Films                 | French                            | 11.856 GHz / V                 | 19.2°E   |
| <b>Canal Plus 16:9</b>                                 | Canal Plus     | TV                    | France                            | <u>Trp 72</u> (27500, 3/4)     | ASTRA-1G |
|                                                        | Pay TV         | Films                 | French                            | 11.856 GHz / V                 | 19.2°E   |
| <b>Canal Plus Bleu</b>                                 | Canal Plus     | TV                    | France                            | <u>Trp 72</u> (27500, 3/4)     | ASTRA-1G |
|                                                        | Pay TV         | Films                 | French                            | 11.856 GHz / V                 | 19.2°E   |
| <b>Canal Plus Jaune</b>                                | Canal Plus     | TV                    | France                            | <u>Trp 72</u> (27500, 3/4)     | ASTRA-1G |



|                          |                |                       |                      |                             |                 |        |
|--------------------------|----------------|-----------------------|----------------------|-----------------------------|-----------------|--------|
|                          | Pay TV         | Films                 | French               | 4)                          | 11.856 GHz / V  | 19.2°E |
| <b>Canal Plus Vert</b>   | Canal Plus     | TV                    | France               | <u>Trp 72</u> (27500, 3/4)  | ASTRA-1G        |        |
|                          | Pay TV         | General Entertainment | French, English      |                             | 11.856 GHz / V  | 19.2°E |
| <b>CanalSat Jeux</b>     | CanalSatellite | TV                    | France               | <u>Trp 96</u> (27500, 3/4)  | ASTRA-1H        |        |
|                          | Pay TV         | Children              | French               |                             | 12.324 GHz / V  | 19.2°E |
| <b>CanalSat Mosaïque</b> | CanalSatellite | TV                    | ASTRA reception area | <u>Trp 96</u> (27500, 3/4)  | ASTRA-1H        |        |
|                          | Free           | Promo                 | French               |                             | 12.324 GHz / V  | 19.2°E |
| <b>Cartoon Network</b>   | CanalSatellite | TV                    | France               | <u>Trp 88</u> (27500, 3/4)  | ASTRA-1G        |        |
|                          | Pay TV         | Children              | Eng., Fre.           |                             | 12.168 GHz / V  | 19.2°E |
| <b>Ciné-Cinemas 16/9</b> | CanalSatellite | TV                    | France               | <u>Trp 66</u> (27500, 3/4)  | ASTRA-1G        |        |
|                          | Pay TV         | Films                 | French               |                             | 11.7395 GHz / V | 19.2°E |
| <b>Ciné-Cinemas I</b>    | CanalSatellite | TV                    | France               | <u>Trp 72</u> (27500, 3/4)  | ASTRA-1G        |        |
|                          | Pay TV         | Films                 | French               |                             | 11.856 GHz / V  | 19.2°E |
| <b>Ciné-Cinemas II</b>   | CanalSatellite | TV                    | France               | <u>Trp 70</u> (27500, 3/4)  | ASTRA-1G        |        |
|                          | Pay TV         | Films                 | French               |                             | 11.817 GHz / V  | 19.2°E |
| <b>Ciné-Cinemas III</b>  | CanalSatellite | TV                    | France               | <u>Trp 70</u> (27500, 3/4)  | ASTRA-1G        |        |
|                          | Pay TV         | Films                 | French               |                             | 11.817 GHz / V  | 19.2°E |
| <b>Ciné Classics</b>     | CanalSatellite | TV                    | France               | <u>Trp 72</u> (27500, 3/4)  | ASTRA-1G        |        |
|                          | Pay TV         | Films                 | French               |                             | 11.856 GHz / V  | 19.2°E |
| <b>Club Téléachat</b>    | CanalSatellite | TV                    | France               | <u>Trp 86</u> (27500, 3/4)  | ASTRA-1H        |        |
|                          | Pay TV         | Shopping              | French               |                             | 12.129 GHz / V  | 19.2°E |
| <b>CNBC</b>              | CanalSatellite | TV                    | France               | <u>Trp 94</u> (27500, 3/4)  | ASTRA-1F        |        |
|                          | Pay TV         | Business              | English              |                             | 12.285 GHz / V  | 19.2°E |
| <b>CNN International</b> | -              | TV                    | ASTRA reception area | <u>Trp 88</u> (27500, 3/4)  | ASTRA-1G        |        |
|                          | Free           | News                  | English              |                             | 12.168 GHz / V  | 19.2°E |
| <b>Comédie</b>           | CanalSatellite | TV                    | France               | <u>Trp 100</u> (27500, 3/4) | ASTRA-1H        |        |
|                          | Pay TV         | General Entertainment | French               |                             | 12.402 GHz / V  | 19.2°E |
| <b>Contact TV</b>        | CanalSatellite | TV                    | France               | <u>Trp 68</u> (27500, 3/4)  | ASTRA-1G        |        |
|                          | Pay TV         | Shopping              | French               |                             | 11.778 GHz / V  | 19.2°E |
| <b>CSat</b>              | CanalSatellite | TV                    | ASTRA reception area | <u>Trp 96</u> (27500, 3/4)  | ASTRA-1H        |        |
|                          | Free           | Promo                 | French               |                             | 12.324 GHz / V  | 19.2°E |
| <b>C: Direct</b>         | CanalSatellite | TV                    | France               | <u>Trp 86</u> (27500, 3/4)  | ASTRA-1H        |        |

|                         |                          |                                |                                |                                                         |          |
|-------------------------|--------------------------|--------------------------------|--------------------------------|---------------------------------------------------------|----------|
| <b>Demain!</b>          | Pay TV<br>CanalSatellite | Computer<br>TV                 | French<br>France               | 12.129 GHz / V 19.2°E<br><u>Trp 100</u><br>(27500, 3/4) | ASTRA-1H |
| <b>Deutsche Welle</b>   | Pay TV<br>-              | Education<br>TV                | French<br>ASTRA reception area | 12.402 GHz / V 19.2°E<br><u>Trp 54</u> (, )             | ASTRA-1E |
| <b>Disney Channel</b>   | Free<br>CanalSatellite   | News<br>TV                     | German<br>France               | 10.788 GHz / V 19.2°E<br><u>Trp 72</u> (27500, 3/4)     | ASTRA-1G |
| <b>DSF</b>              | Pay TV<br>-              | Children<br>TV                 | French<br>ASTRA reception area | 11.856 GHz / V 19.2°E<br><u>Trp 104</u><br>(27500, 3/4) | ASTRA-1H |
| <b>Eins Extra</b>       | Free<br>-                | Sports<br>TV                   | German<br>ASTRA reception area | 12.48 GHz / V 19.2°E<br><u>Trp 85</u> (27500, 3/4)      | ASTRA-1G |
| <b>Eins Festival</b>    | Free<br>-                | News<br>TV                     | German<br>ASTRA reception area | 12.1095 GHz / H 19.2°E<br><u>Trp 85</u> (27500, 3/4)    | ASTRA-1G |
| <b>Eins MuXx</b>        | Free<br>-                | General<br>Entertainment<br>TV | German<br>ASTRA reception area | 12.1095 GHz / H 19.2°E<br><u>Trp 85</u> (27500, 3/4)    | ASTRA-1G |
| <b>Encyclopedia</b>     | CanalSatellite           | TV                             | France                         | 12.1095 GHz / H 19.2°E<br><u>Trp 93</u> (27500, 3/4)    | ASTRA-1H |
| <b>Equidia</b>          | Pay TV<br>CanalSatellite | Documentary<br>TV              | French<br>France               | 12.2655 GHz / H 19.2°E<br><u>Trp 86</u> (27500, 3/4)    | ASTRA-1H |
| <b>ESC1 Egypt</b>       | Pay TV<br>-              | Sports<br>TV                   | French<br>ASTRA reception area | 12.129 GHz / V 19.2°E<br><u>Trp 54</u> (, )             | ASTRA-1E |
| <b>Escales</b>          | Free<br>CanalSatellite   | General<br>Entertainment<br>TV | Arabic<br>France               | 10.788 GHz / V 19.2°E<br><u>Trp 93</u> (27500, 3/4)     | ASTRA-1H |
| <b>Euronews</b>         | Pay TV<br>CanalSatellite | Travel<br>TV                   | French<br>France               | 12.2655 GHz / H 19.2°E<br><u>Trp 90</u> (27500, 3/4)    | ASTRA-1H |
| <b>Euronews</b>         | Pay TV<br>-              | News<br>TV                     | French<br>ASTRA reception area | 12.207 GHz / V 19.2°E<br><u>Trp 77</u> (27500, 3/4)     | ASTRA-1G |
| <b>Eurosport</b>        | Free<br>-                | News<br>TV                     | German<br>ASTRA reception area | 11.9535 GHz / H 19.2°E<br><u>Trp 77</u> (27500, 3/4)    | ASTRA-1G |
| <b>Eurosport France</b> | Free<br>CanalSatellite   | Sports<br>TV                   | German<br>France               | 11.9535 GHz / H 19.2°E<br><u>Trp 68</u> (27500, 3/4)    | ASTRA-1G |
| <b>Fashion TV</b>       | Pay TV<br>-              | Sports<br>TV                   | French<br>ASTRA reception area | 11.778 GHz / V 19.2°E<br><u>Trp 93</u> (27500, 3/4)     | ASTRA-1H |
| <b>Fit TV</b>           | Free<br>CanalSatellite   | Fashion<br>TV                  | Various<br>France              | 12.2655 GHz / H 19.2°E<br><u>Trp 93</u> (27500, 3/4)    | ASTRA-1H |

|                              |                |                       |                      |                             |          |
|------------------------------|----------------|-----------------------|----------------------|-----------------------------|----------|
| <b>Forum Boutique</b>        | Pay TV         | Health                | French               | 12.2655 GHz / H             | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 66</u> (27500, 3/4)  | ASTRA-1G |
| <b>Forum Planète</b>         | Pay TV         | Shopping              | French               | 11.7395 GHz / V             | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 100</u> (27500, 3/4) | ASTRA-1H |
| <b>Fox Kids</b>              | Pay TV         | Documentary           | French               | 12.402 GHz / V              | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 100</u> (27500, 3/4) | ASTRA-1H |
| <b>France 2</b>              | Pay TV         | Children              | French               | 12.402 GHz / V              | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 80</u> (27500, 3/4)  | ASTRA-1H |
| <b>France 3</b>              | Pay TV         | General Entertainment | French               | 12.012 GHz / V              | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 80</u> (27500, 3/4)  | ASTRA-1H |
| <b>Game One</b>              | Pay TV         | General Entertainment | French               | 12.012 GHz / V              | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 100</u> (27500, 3/4) | ASTRA-1H |
| <b>hessen fernsehen</b>      | Pay TV         | Video Games           | French, English      | 12.402 GHz / V              | 19.2°E   |
|                              | -              | TV                    | ASTRA reception area | <u>Trp 71</u> (27500, 3/4)  | ASTRA-1G |
| <b>Home Order Television</b> | Free           | General Entertainment | German               | 11.8365 GHz / H             | 19.2°E   |
|                              | -              | TV                    | ASTRA reception area | <u>Trp 104</u> (27500, 3/4) | ASTRA-1H |
| <b>HOT Le Grand Magasin</b>  | Free           | Shopping              | German               | 12.48 GHz / V               | 19.2°E   |
|                              | Premiere World | TV                    | ASTRA reception area | <u>Trp 87</u> (27500, 3/4)  | ASTRA-1H |
| <b>i-Television</b>          | Free           | Shopping              | French               | 12.1485 GHz / H             | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 70</u> (27500, 3/4)  | ASTRA-1G |
| <b>K1</b>                    | Pay TV         | News                  | French               | 11.817 GHz / V              | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 66</u> (27500, 3/4)  | ASTRA-1G |
| <b>K10</b>                   | Pay TV         | Pay-per-View          | French               | 11.739 GHz / V              | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 86</u> (27500, 3/4)  | ASTRA-1H |
| <b>K11</b>                   | Pay TV         | Pay-per-View          | French               | 12.129 GHz / V              | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 86</u> (27500, 3/4)  | ASTRA-1H |
| <b>K12</b>                   | Pay TV         | Pay-per-View          | French               | 12.129 GHz / V              | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 86</u> (27500, 3/4)  | ASTRA-1H |
| <b>K2</b>                    | Pay TV         | Pay-per-View          | French               | 12.129 GHz / V              | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 66</u> (27500, 3/4)  | ASTRA-1G |
| <b>K3</b>                    | Pay TV         | Pay-per-View          | French               | 11.7395 GHz / V             | 19.2°E   |
|                              | CanalSatellite | TV                    | France               | <u>Trp 66</u> (27500, 3/4)  | ASTRA-1G |
|                              | Pay TV         | Pay-per-View          | French               | 11.7395 GHz /               | 19.2°E   |

|                            |                |                       |                      |                 |                             |          |
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| K4                         | CanalSatellite | TV                    | France               | V               | <u>Trp 66</u> (27500, 3/4)  | ASTRA-1G |
|                            | Pay TV         | Pay-per-View          | French               | 11.7395 GHz /   | 19.2°E                      |          |
| K5                         | CanalSatellite | TV                    | France               | V               | <u>Trp 66</u> (27500, 3/4)  | ASTRA-1G |
|                            | Pay TV         | Pay-per-View          | French               | 11.7395 GHz /   | 19.2°E                      |          |
| K6                         | CanalSatellite | TV                    | France               | V               | <u>Trp 86</u> (27500, 3/4)  | ASTRA-1H |
|                            | Pay TV         | Pay-per-View          | French               | 12.129 GHz / V  | 19.2°E                      |          |
| K7                         | CanalSatellite | TV                    | France               | V               | <u>Trp 86</u> (27500, 3/4)  | ASTRA-1H |
|                            | Pay TV         | Pay-per-View          | French               | 12.129 GHz / V  | 19.2°E                      |          |
| K8                         | CanalSatellite | TV                    | France               | V               | <u>Trp 86</u> (27500, 3/4)  | ASTRA-1H |
|                            | Pay TV         | Pay-per-View          | French               | 12.129 GHz / V  | 19.2°E                      |          |
| K9                         | CanalSatellite | TV                    | France               | V               | <u>Trp 86</u> (27500, 3/4)  | ASTRA-1H |
|                            | Pay TV         | Pay-per-View          | French               | 12.129 GHz / V  | 19.2°E                      |          |
| Kabel 1                    | -              | TV                    | ASTRA reception area | V               | <u>Trp 104</u> (27500, 3/4) | ASTRA-1H |
|                            | Free           | General Entertainment | German               | 12.48 GHz / V   | 19.2°E                      |          |
| Kabel 1 Österreich         | -              | TV                    | ASTRA reception area | V               | <u>Trp 82</u> (27500, 3/4)  | ASTRA-1H |
|                            | Free           | General Entertainment | German               | 12.051 GHz / V  | 19.2°E                      |          |
| Kiosque                    | CanalSatellite | TV                    | ASTRA reception area | V               | <u>Trp 86</u> (27500, 3/4)  | ASTRA-1H |
|                            | Free           | Promo                 | French               | 12.129 GHz / V  | 19.2°E                      |          |
| KI.KA                      | -              | TV                    | ASTRA reception area | V               | <u>Trp 77</u> (27500, 3/4)  | ASTRA-1G |
|                            | Free           | Children              | German               | 11.9535 GHz / H | 19.2°E                      |          |
| KTO                        | CanalSatellite | TV                    | ASTRA reception area | V               | <u>Trp 86</u> (27500, 3/4)  | ASTRA-1H |
|                            | Free           | Religious             | French               | 12.129 GHz / V  | 19.2°E                      |          |
| L'Equipe TV                | CanalSatellite | TV                    | France               | V               | <u>Trp 100</u> (27500, 3/4) | ASTRA-1H |
|                            | Pay TV         | Sports                | French               | 12.402 GHz / V  | 19.2°E                      |          |
| La Chaîne Histoire         | CanalSatellite | TV                    | France               | V               | <u>Trp 93</u> (27500, 3/4)  | ASTRA-1H |
|                            | Pay TV         | Documentary           | French               | 12.2655 GHz / H | 19.2°E                      |          |
| La Chaîne Météo            | CanalSatellite | TV                    | France               | V               | <u>Trp 70</u> (27500, 3/4)  | ASTRA-1G |
|                            | Pay TV         | Weather               | French               | 11.817 GHz / V  | 19.2°E                      |          |
| La Chaîne<br>Parlementaire | CanalSatellite | TV                    | ASTRA reception area | V               | <u>Trp 90</u> (27500, 3/4)  | ASTRA-1H |
|                            | Free           | Political             | French               | 12.207 GHz / V  | 19.2°E                      |          |
| La Cinquième               | -              | TV                    | ASTRA reception area | V               | <u>Trp 90</u> (27500, 3/4)  | ASTRA-1H |
|                            | Free           | Education             | French               | 12.207 GHz / V  | 19.2°E                      |          |

|                             |                |                       |                               |                             |          |
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| <b>LCI - La Chaîne Info</b> | CanalSatellite | TV                    | France                        | <u>Trp 68</u> (27500, 3/4)  | ASTRA-1G |
|                             | Pay TV         | News                  | French                        | 11.778 GHz / V              | 19.2°E   |
| <b>Le Sésame</b>            | CanalSatellite | TV                    | France                        | <u>Trp 96</u> (27500, 3/4)  | ASTRA-1H |
|                             | Free           | TV guide              | French                        | 12.324 GHz / V              | 19.2°E   |
| <b>libertytv.com</b>        | -              | TV                    | ASTRA reception area          | <u>Trp 112</u> (22000, 5/6) | ASTRA-1H |
|                             | Free           | Shopping              | French                        | 12.6105 GHz / V             | 19.2°E   |
| <b>MCM 2</b>                | CanalSatellite | TV                    | France                        | <u>Trp 80</u> (27500, 3/4)  | ASTRA-1E |
|                             | Pay TV         | Music                 | French                        | 12.012 GHz / V              | 19.2°E   |
| <b>MCM Africa</b>           | CanalSatellite | TV                    | France                        | <u>Trp 90</u> (27500, 3/4)  | ASTRA-1H |
|                             | Pay TV         | Music                 | French                        | 12.207 GHz / V              | 19.2°E   |
| <b>MCM Euromusique</b>      | CanalSatellite | TV                    | France                        | <u>Trp 66</u> (27500, 3/4)  | ASTRA-1G |
|                             | Pay TV         | Music                 | French                        | 11.7395 GHz / V             | 19.2°E   |
| <b>MDR Fernsehen</b>        | -              | TV                    | ASTRA reception area          | <u>Trp 85</u> (27500, 3/4)  | ASTRA-1G |
|                             | Free           | General Entertainment | German                        | 12.1095 GHz / H             | 19.2°E   |
| <b>Médecine+</b>            | CanalSatellite | TV                    | France                        | <u>Trp 68</u> (27500, 3/4)  | ASTRA-1G |
|                             | Pay TV         | Health                | French                        | 11.778 GHz / V              | 19.2°E   |
| <b>Mosaico</b>              | CSDigital      | TV                    | ASTRA reception area          | <u>Trp 76</u> (27500, 3/4)  | ASTRA-1F |
|                             | Free           | Promo                 | Spanish                       | 11.934 GHz / V              | 19.2°E   |
| <b>Motors TV</b>            | -              | TV                    | ASTRA reception area          | <u>Trp 112</u> (22000, 5/6) | ASTRA-1H |
|                             | Free           | Sports                | Eng., French                  | 12.6105 GHz / V             | 19.2°E   |
| <b>MTV Europe</b>           | CanalSatellite | TV                    | France, Spain, Canary Islands | <u>Trp 118</u> (22000, 5/6) | ASTRA-1G |
|                             | Pay TV         | Music                 | English                       | 12.699 GHz / V              | 19.2°E   |
| <b>Muzzik</b>               | CanalSatellite | TV                    | France                        | <u>Trp 70</u> (27500, 3/4)  | ASTRA-1G |
|                             | Pay TV         | Music                 | Various                       | 11.817 GHz / V              | 19.2°E   |
| <b>n-tv</b>                 | -              | TV                    | ASTRA reception area          | <u>Trp 116</u> (22000, 5/6) | ASTRA-1G |
|                             | Free           | News                  | German                        | 12.6695 GHz / V             | 19.2°E   |
| <b>N24</b>                  | -              | TV                    | ASTRA reception area          | <u>Trp 104</u> (27500, 3/4) | ASTRA-1H |
|                             | Free           | News                  | German                        | 12.48 GHz / V               | 19.2°E   |
| <b>N3</b>                   | -              | TV                    | ASTRA reception area          | <u>Trp 85</u> (27500, 3/4)  | ASTRA-1G |
|                             | Free           | General Entertainment | German                        | 12.1095 GHz / H             | 19.2°E   |
| <b>NBC Europe</b>           | CSDigital      | TV                    | Spain, France                 | <u>Trp 94</u> (27500, 3/4)  | ASTRA-1F |
|                             | Pay TV         | General Entertainment | English                       | 12.285 GHz / V              | 19.2°E   |

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| Nordlicht TV              | -              | TV                    | ASTRA reception area | <u>Trp 108</u><br>(22000, 5/6) | ASTRA-1G |
|                           | Free           | General Entertainment | Luxemburgish         | 12.551 GHz / V                 | 19.2°E   |
| OM TV                     | CanalSatellite | TV                    | France               | <u>Trp 86</u> (27500, 3/4)     | ASTRA-1H |
|                           | Pay TV         | Sports                | French               | 12.129 GHz / V                 | 19.2°E   |
| ORB-Fernsehen             | -              | TV                    | ASTRA reception area | <u>Trp 85</u> (27500, 3/4)     | ASTRA-1G |
|                           | Free           | General Entertainment | German               | 12.1095 GHz / H                | 19.2°E   |
| Paris Première            | CanalSatellite | TV                    | France               | <u>Trp 68</u> (27500, 3/4)     | ASTRA-1G |
|                           | Pay TV         | General Entertainment | French               | 11.778 GHz / V                 | 19.2°E   |
| Pathé Sports              | CanalSatellite | TV                    | France               | <u>Trp 70</u> (27500, 3/4)     | ASTRA-1G |
|                           | Pay TV         | Sports                | French               | 11.817 GHz / V                 | 19.2°E   |
| Phoenix                   | -              | TV                    | ASTRA reception area | <u>Trp 71</u> (27500, 3/4)     | ASTRA-1G |
|                           | Free           | News                  | German               | 11.8365 GHz / H                | 19.2°E   |
| Planète                   | CanalSatellite | TV                    | France               | <u>Trp 68</u> (27500, 3/4)     | ASTRA-1G |
|                           | Pay TV         | Documentary           | French               | 11.778 GHz / V                 | 19.2°E   |
| Premiere World Info-Kanal | Premiere World | TV                    | ASTRA reception area | <u>Trp 68</u> (27500, 3/4)     | ASTRA-1F |
|                           | Free           | Promo                 | German               | 11.7975 GHz / H                | 19.2°E   |
| Pro 7                     | -              | TV                    | ASTRA reception area | <u>Trp 104</u><br>(27500, 3/4) | ASTRA-1H |
|                           | Free           | General Entertainment | German               | 12.48 GHz / V                  | 19.2°E   |
| Pro 7 Österreich          | -              | TV                    | ASTRA reception area | <u>Trp 82</u> (27500, 3/4)     | ASTRA-1H |
|                           | Free           | General Entertainment | German               | 12.051 GHz / V                 | 19.2°E   |
| Pro 7 Schweiz             | -              | TV                    | ASTRA reception area | <u>Trp 82</u> (27500, 3/4)     | ASTRA-1H |
|                           | Free           | General Entertainment | German               | 12.051 GHz / V                 | 19.2°E   |
| QVC Germany               | -              | TV                    | ASTRA reception area | <u>Trp 108</u><br>(22000, 5/6) | ASTRA-1G |
|                           | Free           | Shopping              | German               | 12.551 GHz / V                 | 19.2°E   |
| RAI Uno                   | -              | TV                    | ASTRA reception area | <u>Trp 84</u> (.)              | ASTRA-1E |
|                           | Free           | General Entertainment | Italian              | 10.788 GHz / V                 | 19.2°E   |
| RFM TV                    | CanalSatellite | TV                    | France               | <u>Trp 93</u> (27500, 3/4)     | ASTRA-1H |
|                           | Pay TV         | Music                 | French               | 12.2655 GHz / H                | 19.2°E   |
| RFO SAT                   | CanalSatellite | TV                    | France               | <u>Trp 100</u><br>(27500, 3/4) | ASTRA-1H |
|                           | Pay TV         | General Entertainment | French               | 12.402 GHz / V                 | 19.2°E   |
| RTL 2                     | -              | TV                    | ASTRA reception area | <u>Trp 89</u> (27500, 3/4)     | ASTRA-1H |