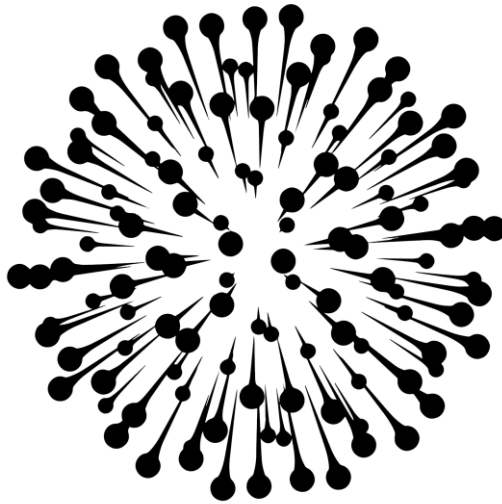


# PIXXEL SPACE TECHNOLOGIES, INC.

Interference Analysis and EMC Analysis for Anand Mission



PIXXEL

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# Purpose and Scope

This document provides an interference and EMC analysis and is prepared to support Pixxel Space Technologies, Inc.'s (hereafter referred to as "Pixxel") experimental license application, ELS File No. 0886-EX-CN-2019 (FCC Part 5). The document contains an International Telecommunication Union ("ITU") Space Network List ("SNL") database search associated with the space-to-Earth and Earth-to-space frequency bands being proposed for use in the aforementioned Part 5 experimental license application and an explanation regarding the mitigation measures Pixxel is undertaking to ensure that its operations will not cause harmful interference.

We note that there are three categories of space systems that apply in our circumstances:

- 1) Those systems with which there is no potential for interference;
- 2) Those systems with which there is some potential for interference; and
- 3) Those systems which have applied to the process as an Advanced Publication Information ("API") filing and which request the entire frequency band. It is not possible to assess these Category 3 systems at this time because they have not quantified their actual intended operating frequencies.

**NOTE: We place these systems in a different category assuming they will not likely be launched or operated during the limited term of our experimental (Part 5) license.**

**In this document, we will focus on systems only in Category 2 as these systems are the only likely systems that would seem to be capable of any conflict in terms of potential interference.**

## Summary of the SNL searches

Below is a summary of systems having potential for interference, i.e., falling under category 2 as explained in the section above:

401.8974 to 401.9026 MHz Band Systems; NGSO; Space-Earth links; POTENTIAL CONFLICT:

| SNL list for 401.8 to 402 MHz; NGSO;Space-Earth Link; POTENTIAL CONFLICT |         |                    |               |                               |
|--------------------------------------------------------------------------|---------|--------------------|---------------|-------------------------------|
| No.                                                                      | Country | System Name at ITU | NOTIF. REASON | Reason for Potential Conflict |

|                     |     |                |   |                        |
|---------------------|-----|----------------|---|------------------------|
| 1                   | CHN | GRID           | A | Overlapping Assignment |
| 2                   | HOL | HOL-MG-ANS-002 | N | Overlapping Assignment |
| <b>Total:<br/>2</b> |     |                |   |                        |

Out of the 64 systems reported in this frequency band, two systems exhibit a possibility of interference. Both the Chinese system and the system from Holland, which we understand is operated by Hiber, likely operate with stations falling beyond our systems coverage area, but we are not certain at the moment. To the extent there is a system coverage overlap, Pixxel will coordinate with the operators to resolve any conflicts, consistent with ITU regulations. Further, the UHF downlink is telemetry signal that will be transmitting only to a ground station in Milan (apart from LEOP), Italy during nominal satellite operations.<sup>[1]</sup> Accordingly, the potential for harmful interference is low.

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<sup>[1]</sup>We commit to reduce beacon transmissions after LEOP and transmit only when the satellite is visible by the Milan station.

## 2242.35 to 2243.65 MHz Band Systems;NGSO; Space-Earth links; POTENTIAL CONFLICT:

| <b>SNL list for 2242 to 2244 MHz; NGSO;Space-Earth Link; POTENTIAL CONFLICT</b> |                |                           |                      |                                               |
|---------------------------------------------------------------------------------|----------------|---------------------------|----------------------|-----------------------------------------------|
| <b>No.</b>                                                                      | <b>Country</b> | <b>System Name at ITU</b> | <b>NOTIF. REASON</b> | <b>Reason for Potential Conflict</b>          |
| 1                                                                               | B              | VCUB1                     | A                    | Overlapping Assignment                        |
| 2                                                                               | CAN            | GHGSAT-D                  | A                    | Overlapping Assignment                        |
| 3                                                                               | CHN            | SPPOSS-2-01               | A & N                | Partial overlap on both TSDN1 and TSDN2 beams |
| 4                                                                               | CHN            | TIANZHOU                  | N                    | Overlapping Assignment                        |
| 5                                                                               | CHN            | 2M8M-SAT                  | A & N                | Overlapping Assignment                        |
| 6                                                                               | CHN            | HJ-1-ABC                  | N                    | Slight Overlap                                |
| 7                                                                               | CHN            | JILIN-1SPW-2              | N                    | Overlapping Assignment                        |

|                      |         |                |       |                                               |
|----------------------|---------|----------------|-------|-----------------------------------------------|
| 8                    | CHN     | TIANZHI-01     | A     | Partial overlap on both TSDN1 and TSDN2 beams |
| 9                    | CHN     | HJ-2-AB        | A     | Partial overlap on the SSD beam               |
| 10                   | F / ESA | ACES           | A & N | Partial overlap on the STX beam               |
| 11                   | F       | BRONET         | A     | Overlapping Assignment                        |
| 12                   | HOL     | HOL-MG-ANS-002 | A & N | Overlapping Assignment                        |
| 13                   | NOR     | TYVAK-182A     | A     | Overlapping Assignment                        |
| 14                   | NOR     | TYVAK-1005     | A     | Partial Overlap on the SBANDTX band           |
| 15                   | NZL     | ELECTRONNZ-3   | A     | Overlapping Assignment                        |
| 16                   | USA     | PROMETHEUS-B1  | A     | Overlapping Assignment                        |
| 17                   | USA     | PROMETHEUS-B2  | A     | Overlapping Assignment                        |
| <b>Total:<br/>17</b> |         |                |       |                                               |

Out of the 167 systems reported under this frequency band, 17 exhibit a possibility of interference. Of these 17 systems, only 8 systems have been notified.

- Most of the Chinese satellites are expected to operate outside our coverage area (SPPOSS-2-01, Tianzhou, 2M8M-SAT and HJ-1-ABC). HJ-1-ABC has a 250 kHz overlap. JILIN-1SPW-2 has requested the complete beam.
- We have a spectrum overlap of 1.15 MHz with ACES. At this point of time, we are uncertain about its operations.
- We expect that HOL-MG-ANS-002 will operate using stations falling outside our coverage area.
- Electronnz-3 will be operating outside our coverage area.

## Further Coordination and EMC analysis

Concerning the 401.8974 to 401.9026 MHz band, Pixxel anticipates minimal problems in coordination. First, we found only two systems operating in these specific frequencies operating in this band. Second, this is telemetry signal that will be transmitting only to a ground station in Milan, Italy during nominal satellite operations. Accordingly, the potential for harmful

interference is low.

Regarding the 2242.35 to 2243.65 MHz band, Pixxel agrees to coordinate with affected operators to determine appropriate mitigation measures. Use of this frequency for data transmission purposes will be only during sunlit period over the four allocated earth stations. Accordingly, we will have data transmission over the proposed link for approximately 8 or less passes per day from the total network, and the pass durations are less than or equal to 10 minutes per pass. Additionally, the mission duration is expected to be less than 500 days.

We can perform further analysis on systems that could operate co-channel to our own once we have discussed the details of these systems with the appropriate operators.

A complete breakdown of our SNL database search has also been provided as an Appendix for reference.

## Appendix: SNL databases searches

Telemetry band (UHF - 401.9 Centre Frequency with 5.2 kHz BW):

Search query:

**401.8 – 402.00 MHz; NGSO; space-to-Earth; All Latitudes; All Submission Reasons**

**ALL ENTRIES:**

| KEY |                                                     |
|-----|-----------------------------------------------------|
|     | Category 1 - No potential for interference          |
|     | Category 2 - Potential for interference             |
|     | Category 3 - Filed API requesting the complete band |

| ADM/ORG | SATELLITE NAME           | NOTIF.REASON | BR IFIC              | FREQUENCIES          |
|---------|--------------------------|--------------|----------------------|----------------------|
|         |                          |              |                      |                      |
| AFS     | <a href="#">ZACUBE-2</a> | A            | <a href="#">2875</a> | <a href="#">view</a> |

|     |                             |   |                      |                      |
|-----|-----------------------------|---|----------------------|----------------------|
| ARS | <a href="#">SAUDISAT-1C</a> | N | <a href="#">2667</a> | <a href="#">view</a> |
| ARS | <a href="#">SAUDISAT-6</a>  | N | <a href="#">2818</a> | <a href="#">view</a> |
| ARS | <a href="#">SAUDISAT-4</a>  | N | <a href="#">2819</a> | <a href="#">view</a> |
| ARS | <a href="#">SAUDISAT-5</a>  | N | <a href="#">2819</a> | <a href="#">view</a> |
| ARS | <a href="#">SAUDISAT-4</a>  | A | <a href="#">2900</a> | <a href="#">view</a> |
| ARS | <a href="#">SAUDISAT-5</a>  | A | <a href="#">2901</a> | <a href="#">view</a> |
| ARS | <a href="#">SAUDISAT-6</a>  | A | <a href="#">2901</a> | <a href="#">view</a> |
| BEL | <a href="#">SIMBA</a>       | A | <a href="#">2889</a> | <a href="#">view</a> |
| CAN | <a href="#">JC2SAT</a>      | A | <a href="#">2640</a> | <a href="#">view</a> |
| CAN | <a href="#">MULTUS</a>      | A | <a href="#">2874</a> | <a href="#">view</a> |
| CAN | <a href="#">KELYPsis</a>    | A | <a href="#">2884</a> | <a href="#">view</a> |
| CHN | <a href="#">KS-2</a>        | A | <a href="#">2872</a> | <a href="#">view</a> |
| CHN | <a href="#">CMARS-1</a>     | A | <a href="#">2878</a> | <a href="#">view</a> |
| CHN | <a href="#">TFSTAR</a>      | A | <a href="#">2896</a> | <a href="#">view</a> |
| CHN | <a href="#">TY3-04</a>      | A | <a href="#">2897</a> | <a href="#">view</a> |
| CHN | <a href="#">TY1-06</a>      | A | <a href="#">2905</a> | <a href="#">view</a> |
| CHN | <a href="#">GRID</a>        | A | <a href="#">2910</a> | <a href="#">view</a> |
| CHN | <a href="#">SMARTSAT-1</a>  | A | <a href="#">2910</a> | <a href="#">view</a> |
| CHN | <a href="#">TY-SKYLAB</a>   | A | <a href="#">2910</a> | <a href="#">view</a> |

|     |                                |   |                      |                      |
|-----|--------------------------------|---|----------------------|----------------------|
| CHN | <a href="#">WESAT-1</a>        | A | <a href="#">2913</a> | <a href="#">view</a> |
| D   | <a href="#">ERNST</a>          | A | <a href="#">2911</a> | <a href="#">view</a> |
| DNK | <a href="#">STARLING</a>       | A | <a href="#">2891</a> | <a href="#">view</a> |
| E   | <a href="#">OPTOS</a>          | N | <a href="#">2764</a> | <a href="#">view</a> |
| E   | <a href="#">AISTECH</a>        | A | <a href="#">2896</a> | <a href="#">view</a> |
| E   | <a href="#">3CAT5A</a>         | A | <a href="#">2899</a> | <a href="#">view</a> |
| E   | <a href="#">3CAT5B</a>         | A | <a href="#">2899</a> | <a href="#">view</a> |
| F   | <a href="#">BRONET</a>         | A | <a href="#">2891</a> | <a href="#">view</a> |
| F   | <a href="#">F-SAT-NG-8</a>     | A | <a href="#">2898</a> | <a href="#">view</a> |
| G   | <a href="#">SSG-3D</a>         | A | <a href="#">2852</a> | <a href="#">view</a> |
| G   | <a href="#">SOAR</a>           | A | <a href="#">2904</a> | <a href="#">view</a> |
| G   | <a href="#">FARADAY-1</a>      | A | <a href="#">2908</a> | <a href="#">view</a> |
| G   | <a href="#">UHURA</a>          | A | <a href="#">2911</a> | <a href="#">view</a> |
| G   | <a href="#">CDCSAT-1</a>       | A | <a href="#">2913</a> | <a href="#">view</a> |
| HNG | <a href="#">RADCUBE</a>        | A | <a href="#">2912</a> | <a href="#">view</a> |
| HOL | <a href="#">IPS</a>            | A | <a href="#">2821</a> | <a href="#">view</a> |
| HOL | <a href="#">HOL-MG-ANS-002</a> | A | <a href="#">2862</a> | <a href="#">view</a> |
| HOL | <a href="#">HOL-MG-ANS-002</a> | N | <a href="#">2884</a> | <a href="#">view</a> |

|     |                                     |   |                      |                      |
|-----|-------------------------------------|---|----------------------|----------------------|
| I   | <a href="#">UHETSAT</a>             | A | <a href="#">2880</a> | <a href="#">view</a> |
| ISR | <a href="#">NSL-2</a>               | A | <a href="#">2868</a> | <a href="#">view</a> |
| ISR | <a href="#">CMTRL</a>               | A | <a href="#">2913</a> | <a href="#">view</a> |
| J   | <a href="#">MSTD</a>                | A | <a href="#">2885</a> | <a href="#">view</a> |
| LTU | <a href="#">LTU-UHF1</a>            | A | <a href="#">2909</a> | <a href="#">view</a> |
| LUX | <a href="#">MINAS</a>               | A | <a href="#">2880</a> | <a href="#">view</a> |
| LUX | <a href="#">KSM1</a>                | A | <a href="#">2910</a> | <a href="#">view</a> |
| LUX | <a href="#">JARVIS</a>              | A | <a href="#">2910</a> | <a href="#">view</a> |
| NOR | <a href="#">TYVAK-0082</a>          | A | <a href="#">2890</a> | <a href="#">view</a> |
| NOR | <a href="#">TYVAK-0092</a>          | A | <a href="#">2904</a> | <a href="#">view</a> |
| NOR | <a href="#">TYVAK-182A</a>          | A | <a href="#">2905</a> | <a href="#">view</a> |
| NZL | <a href="#">ELECTRONNZ</a>          | A | <a href="#">2876</a> | <a href="#">view</a> |
| NZL | <a href="#">ELECTRONNZ-<br/>2</a>   | A | <a href="#">2908</a> | <a href="#">view</a> |
| NZL | <a href="#">ELECTRONNZ-<br/>3</a>   | A | <a href="#">2909</a> | <a href="#">view</a> |
| POL | <a href="#">SWIATOWID 2</a>         | A | <a href="#">2896</a> | <a href="#">view</a> |
| RUS | <a href="#">AURIGA</a>              | A | <a href="#">2866</a> | <a href="#">view</a> |
| S   | <a href="#">BEYOND-<br/>ATLAS-1</a> | A | <a href="#">2907</a> | <a href="#">view</a> |
| SNG | <a href="#">COLUGO</a>              | A | <a href="#">2862</a> | <a href="#">view</a> |

|        |                            |   |                      |                      |
|--------|----------------------------|---|----------------------|----------------------|
| THA    | <a href="#">RTAFSAT</a>    | A | <a href="#">2903</a> | <a href="#">view</a> |
| USA    | <a href="#">MSL</a>        | N | <a href="#">2750</a> | <a href="#">view</a> |
| USA    | <a href="#">INSIGHT</a>    | A | <a href="#">2764</a> | <a href="#">view</a> |
| USA    | <a href="#">USASAT-30F</a> | A | <a href="#">2788</a> | <a href="#">view</a> |
| USA    | <a href="#">MARS 2020</a>  | A | <a href="#">2831</a> | <a href="#">view</a> |
| USA    | <a href="#">LEMUR-2-3</a>  | A | <a href="#">2867</a> | <a href="#">view</a> |
| USA    | <a href="#">INSIGHT</a>    | N | <a href="#">2873</a> | <a href="#">view</a> |
| USA    | <a href="#">CUPID</a>      | A | <a href="#">2902</a> | <a href="#">view</a> |
|        |                            |   |                      |                      |
| TOTAL: |                            |   |                      | 64                   |

**ENTRIES HAVING NO CONFLICT:**

| No. | Notifying Administration | Satellite Name | NOTIF. REASON | Reason for no conflict                                  |
|-----|--------------------------|----------------|---------------|---------------------------------------------------------|
|     |                          |                |               |                                                         |
| 1   | ARS                      | SAUDISAT-1C    | N             | Transaction completely removed                          |
| 2   | ARS                      | SAUDISAT-6     | A & N         | No common Earth Stations, frequencies end at 401.89 MHz |
| 3   | ARS                      | SAUDISAT-4     | A&N           | No common Earth Stations,                               |

|    |     |            |     |                                                         |
|----|-----|------------|-----|---------------------------------------------------------|
|    |     |            |     | frequencies end at 401.89 MHz                           |
| 4  | ARS | SAUDISAT-5 | A&N | No common Earth Stations, frequencies end at 401.89 MHz |
| 5  | CHN | KS-2       | A   | KSAT-TYPICAL, No common Earth Stations                  |
| 6  | CHN | TFSTAR     | A   | Frequencies end at 401.812 MHz                          |
| 7  | CHN | TY3-04     | A   | Frequencies end at 401.812 MHz                          |
| 8  | CHN | TY1-06     | A   | Frequencies end at 401.812 MHz                          |
| 9  | CHN | SMARTSAT-1 | A   | No common Earth Stations                                |
| 10 | CHN | TY-SKYLAB  | A   | Frequencies end at 401.825 MHz                          |
| 11 | CHN | WESAT-1    | A   | No frequency overlap                                    |
| 12 | E   | OPTOS      | N   | Frequencies start from 401.97 MHz                       |
| 13 | HNG | RADCUBE    | A   | Frequencies end at 401.876 MHz                          |
| 14 | J   | MSTD       | A   | No common Earth Stations                                |
| 15 | NOR | TYVAK-182A | A   | Frequencies end at 401.849 MHz                          |
| 16 | USA | MSL        | N   | Transaction completely removed                          |
| 17 | USA | INSIGHT    | A&N | No common Earth-Stations                                |

|    |     |              |   |                          |
|----|-----|--------------|---|--------------------------|
| 18 | USA | MARS 2020    | A | Mars mission             |
| 19 | NZL | ELECTRONNZ   | A | No common Earth Stations |
| 20 | NZL | ELECTRONNZ-2 | A | No common Earth Stations |
| 21 | NZL | ELECTRONNZ-3 | A | No common Earth Stations |

Data Downlink Band (S-Band - 2243 Centre Frequency with 1.3 MHz BW):

Search query:

2242 – 2244 MHz; NGSO; space-to-Earth; All Latitudes; All Submission Reasons

ALL ENTRIES:

| KEY |                                                     |
|-----|-----------------------------------------------------|
|     | Category 1 - No potential for interference          |
|     | Category 2 - Potential for interference             |
|     | Category 3 - Filed API requesting the complete band |

| ADM/ORG | SATELLITE NAME           | NOTIF.REASON | BR IFIC              | FREQUENCIES          |
|---------|--------------------------|--------------|----------------------|----------------------|
| <hr/>   |                          |              |                      |                      |
| AFS     | <a href="#">ZACUBE-2</a> | A            | <a href="#">2875</a> | <a href="#">view</a> |
| ALG     | <a href="#">ALSAT-1B</a> | A            | <a href="#">2811</a> | <a href="#">view</a> |
| AUS     | <a href="#">MNSAT</a>    | A            | <a href="#">2910</a> | <a href="#">view</a> |

|     |                                     |   |                             |                             |
|-----|-------------------------------------|---|-----------------------------|-----------------------------|
| B   | <a href="#"><u>VCUB1</u></a>        | A | <a href="#"><u>2898</u></a> | <a href="#"><u>view</u></a> |
| BEL | <a href="#"><u>UNICORN-1</u></a>    | A | <a href="#"><u>2843</u></a> | <a href="#"><u>view</u></a> |
| CAN | <a href="#"><u>JC2SAT</u></a>       | A | <a href="#"><u>2640</u></a> | <a href="#"><u>view</u></a> |
| CAN | <a href="#"><u>M3MSAT</u></a>       | A | <a href="#"><u>2723</u></a> | <a href="#"><u>view</u></a> |
| CAN | <a href="#"><u>ADS</u></a>          | A | <a href="#"><u>2724</u></a> | <a href="#"><u>view</u></a> |
| CAN | <a href="#"><u>NEOSSAT-1A</u></a>   | A | <a href="#"><u>2743</u></a> | <a href="#"><u>view</u></a> |
| CAN | <a href="#"><u>SAPPHIRE</u></a>     | N | <a href="#"><u>2744</u></a> | <a href="#"><u>view</u></a> |
| CAN | <a href="#"><u>GHGSAT-D</u></a>     | A | <a href="#"><u>2773</u></a> | <a href="#"><u>view</u></a> |
| CAN | <a href="#"><u>EV9</u></a>          | A | <a href="#"><u>2784</u></a> | <a href="#"><u>view</u></a> |
| CAN | <a href="#"><u>CANSAT-LEO-S</u></a> | A | <a href="#"><u>2842</u></a> | <a href="#"><u>view</u></a> |
| CAN | <a href="#"><u>MAPLELEAF-1</u></a>  | A | <a href="#"><u>2844</u></a> | <a href="#"><u>view</u></a> |
| CAN | <a href="#"><u>NORTHSTAR</u></a>    | A | <a href="#"><u>2863</u></a> | <a href="#"><u>view</u></a> |
| CAN | <a href="#"><u>KELYPsis</u></a>     | A | <a href="#"><u>2884</u></a> | <a href="#"><u>view</u></a> |
| CHN | <a href="#"><u>COMPASS-H</u></a>    | U | <a href="#"><u>2514</u></a> | <a href="#"><u>view</u></a> |
| CHN | <a href="#"><u>COMPASS-M</u></a>    | U | <a href="#"><u>2514</u></a> | <a href="#"><u>view</u></a> |
| CHN | <a href="#"><u>COMPASS-H</u></a>    | N | <a href="#"><u>2596</u></a> | <a href="#"><u>view</u></a> |
| CHN | <a href="#"><u>COMPASS-M</u></a>    | N | <a href="#"><u>2596</u></a> | <a href="#"><u>view</u></a> |
| CHN | <a href="#"><u>CE-1</u></a>         | N | <a href="#"><u>2646</u></a> | <a href="#"><u>view</u></a> |
| CHN | <a href="#"><u>SHENZHOu</u></a>     | N | <a href="#"><u>2749</u></a> | <a href="#"><u>view</u></a> |

|     |                               |   |                      |                      |
|-----|-------------------------------|---|----------------------|----------------------|
| CHN | <a href="#">NUAA-1</a>        | N | <a href="#">2752</a> | <a href="#">view</a> |
| CHN | <a href="#">SPPOSS-2-01</a>   | A | <a href="#">2780</a> | <a href="#">view</a> |
| CHN | <a href="#">COMPASS-MEO</a>   | A | <a href="#">2796</a> | <a href="#">view</a> |
| CHN | <a href="#">TIANZHOU</a>      | A | <a href="#">2797</a> | <a href="#">view</a> |
| CHN | <a href="#">SPACEKEY-1</a>    | A | <a href="#">2838</a> | <a href="#">view</a> |
| CHN | <a href="#">SPPOSS-2-01</a>   | N | <a href="#">2841</a> | <a href="#">view</a> |
| CHN | <a href="#">ZJ-1</a>          | A | <a href="#">2843</a> | <a href="#">view</a> |
| CHN | <a href="#">COMPASS-MEO</a>   | U | <a href="#">2844</a> | <a href="#">view</a> |
| CHN | <a href="#">JILIN-1SPW-1</a>  | A | <a href="#">2855</a> | <a href="#">view</a> |
| CHN | <a href="#">GC-8</a>          | A | <a href="#">2858</a> | <a href="#">view</a> |
| CHN | <a href="#">JILIN-1SPW-2</a>  | A | <a href="#">2858</a> | <a href="#">view</a> |
| CHN | <a href="#">LUNAR CTDRS-1</a> | A | <a href="#">2866</a> | <a href="#">view</a> |
| CHN | <a href="#">HY-2N</a>         | A | <a href="#">2867</a> | <a href="#">view</a> |
| CHN | <a href="#">DES-LEO</a>       | A | <a href="#">2867</a> | <a href="#">view</a> |
| CHN | <a href="#">GC-9</a>          | A | <a href="#">2869</a> | <a href="#">view</a> |
| CHN | <a href="#">TIANZHOU</a>      | N | <a href="#">2874</a> | <a href="#">view</a> |
| CHN | <a href="#">2M8M-SAT</a>      | A | <a href="#">2874</a> | <a href="#">view</a> |
| CHN | <a href="#">COMPASS-IGSO</a>  | U | <a href="#">2876</a> | <a href="#">view</a> |

|     |                              |   |                      |                      |
|-----|------------------------------|---|----------------------|----------------------|
| CHN | <a href="#">ACONNECT</a>     | A | <a href="#">2878</a> | <a href="#">view</a> |
| CHN | <a href="#">ACONNECT-T</a>   | A | <a href="#">2878</a> | <a href="#">view</a> |
| CHN | <a href="#">SPACEWAY</a>     | A | <a href="#">2878</a> | <a href="#">view</a> |
| CHN | <a href="#">ZHOBT-1</a>      | A | <a href="#">2881</a> | <a href="#">view</a> |
| CHN | <a href="#">ZJ-1</a>         | N | <a href="#">2883</a> | <a href="#">view</a> |
| CHN | <a href="#">HJ-1-ABC</a>     | N | <a href="#">2887</a> | <a href="#">view</a> |
| CHN | <a href="#">JILIN-1SPW-2</a> | N | <a href="#">2888</a> | <a href="#">view</a> |
| CHN | <a href="#">TIANWANG</a>     | N | <a href="#">2890</a> | <a href="#">view</a> |
| CHN | <a href="#">COMPASS-MEO</a>  | N | <a href="#">2891</a> | <a href="#">view</a> |
| CHN | <a href="#">JILIN-1GPW-1</a> | A | <a href="#">2891</a> | <a href="#">view</a> |
| CHN | <a href="#">TIANZHI-01</a>   | A | <a href="#">2891</a> | <a href="#">view</a> |
| CHN | <a href="#">SIGNSAT-NGSO</a> | A | <a href="#">2892</a> | <a href="#">view</a> |
| CHN | <a href="#">XINGYUN-2</a>    | A | <a href="#">2897</a> | <a href="#">view</a> |
| CHN | <a href="#">COMPASS-IGSO</a> | N | <a href="#">2898</a> | <a href="#">view</a> |
| CHN | <a href="#">JILIN-1GXW-1</a> | A | <a href="#">2898</a> | <a href="#">view</a> |
| CHN | <a href="#">TSN-1A</a>       | A | <a href="#">2898</a> | <a href="#">view</a> |
| CHN | <a href="#">COMPASS-IGSO</a> | A | <a href="#">2900</a> | <a href="#">view</a> |
| CHN | <a href="#">HJ-2-AB</a>      | A | <a href="#">2900</a> | <a href="#">view</a> |

|         |                            |   |                      |                      |
|---------|----------------------------|---|----------------------|----------------------|
| CHN     | <a href="#">2M8M-SAT</a>   | N | <a href="#">2901</a> | <a href="#">view</a> |
| CHN     | <a href="#">TIANGONG</a>   | A | <a href="#">2903</a> | <a href="#">view</a> |
| CHN     | <a href="#">HY-2N</a>      | N | <a href="#">2909</a> | <a href="#">view</a> |
| CHN     | <a href="#">X-STAR</a>     | A | <a href="#">2910</a> | <a href="#">view</a> |
| CHN     | <a href="#">ACONNECT-B</a> | A | <a href="#">2911</a> | <a href="#">view</a> |
| CHN     | <a href="#">GW</a>         | A | <a href="#">2911</a> | <a href="#">view</a> |
| CHN     | <a href="#">C-SAT-LEO</a>  | A | <a href="#">2911</a> | <a href="#">view</a> |
| CHN     | <a href="#">DK-1</a>       | A | <a href="#">2911</a> | <a href="#">view</a> |
| CHN     | <a href="#">BEIJING-3</a>  | A | <a href="#">2912</a> | <a href="#">view</a> |
| CYP     | <a href="#">LCSC-NET</a>   | A | <a href="#">2904</a> | <a href="#">view</a> |
| D       | <a href="#">RAPIDEYE</a>   | N | <a href="#">2637</a> | <a href="#">view</a> |
| D       | <a href="#">SARAH</a>      | A | <a href="#">2903</a> | <a href="#">view</a> |
| DNK     | <a href="#">ULLORIAQ</a>   | A | <a href="#">2840</a> | <a href="#">view</a> |
| DNK     | <a href="#">STARLING</a>   | A | <a href="#">2891</a> | <a href="#">view</a> |
| E       | <a href="#">AISTECH</a>    | A | <a href="#">2896</a> | <a href="#">view</a> |
| E       | <a href="#">3CAT5A</a>     | A | <a href="#">2899</a> | <a href="#">view</a> |
| E       | <a href="#">3CAT5B</a>     | A | <a href="#">2899</a> | <a href="#">view</a> |
| F / ESA | <a href="#">SOHO</a>       | N | <a href="#">2574</a> | <a href="#">view</a> |
| F / GLS | <a href="#">MSATNAV-2</a>  | N | <a href="#">2588</a> | <a href="#">view</a> |

|         |                              |   |                      |                      |
|---------|------------------------------|---|----------------------|----------------------|
| F / GLS | <a href="#">MSATNAV-3</a>    | N | <a href="#">2588</a> | <a href="#">view</a> |
| F / GLS | <a href="#">MSATNAV-4</a>    | N | <a href="#">2588</a> | <a href="#">view</a> |
| F       | <a href="#">ASV</a>          | A | <a href="#">2778</a> | <a href="#">view</a> |
| F / ESA | <a href="#">ACES</a>         | A | <a href="#">2806</a> | <a href="#">view</a> |
| F / ESA | <a href="#">ACES</a>         | N | <a href="#">2831</a> | <a href="#">view</a> |
| F       | <a href="#">VHR2020</a>      | A | <a href="#">2850</a> | <a href="#">view</a> |
| F / ESA | <a href="#">CLUSTER 1-5</a>  | N | <a href="#">2888</a> | <a href="#">view</a> |
| F       | <a href="#">BRONET</a>       | A | <a href="#">2891</a> | <a href="#">view</a> |
| FIN     | <a href="#">ICEYE</a>        | A | <a href="#">2905</a> | <a href="#">view</a> |
| G       | <a href="#">SSG-3D</a>       | A | <a href="#">2852</a> | <a href="#">view</a> |
| G       | <a href="#">REMDEB</a>       | A | <a href="#">2866</a> | <a href="#">view</a> |
| G       | <a href="#">CATAPULT-IOD</a> | A | <a href="#">2898</a> | <a href="#">view</a> |
| G       | <a href="#">DT1</a>          | A | <a href="#">2899</a> | <a href="#">view</a> |
| G       | <a href="#">EN-A2</a>        | A | <a href="#">2900</a> | <a href="#">view</a> |
| G       | <a href="#">BEESAT-OC-LS</a> | A | <a href="#">2905</a> | <a href="#">view</a> |
| G       | <a href="#">FARADAY-1</a>    | A | <a href="#">2908</a> | <a href="#">view</a> |
| G       | <a href="#">JUKEBOX</a>      | A | <a href="#">2913</a> | <a href="#">view</a> |
| G       | <a href="#">CDCSAT-1</a>     | A | <a href="#">2913</a> | <a href="#">view</a> |
| G       | <a href="#">SOAR</a>         | A | <a href="#">2915</a> | <a href="#">view</a> |

|         |                                          |   |                             |                             |
|---------|------------------------------------------|---|-----------------------------|-----------------------------|
| HOL     | <a href="#"><u>HOL-MG-ANS-002</u></a>    | A | <a href="#"><u>2862</u></a> | <a href="#"><u>view</u></a> |
| HOL     | <a href="#"><u>HOL-MG-ANS-002</u></a>    | N | <a href="#"><u>2884</u></a> | <a href="#"><u>view</u></a> |
| I / GLS | <a href="#"><u>GALILEO-M-NAVSTAR</u></a> | N | <a href="#"><u>2639</u></a> | <a href="#"><u>view</u></a> |
| I       | <a href="#"><u>OPTSAT</u></a>            | A | <a href="#"><u>2833</u></a> | <a href="#"><u>view</u></a> |
| IND     | <a href="#"><u>OCEANSAT-2</u></a>        | A | <a href="#"><u>2671</u></a> | <a href="#"><u>view</u></a> |
| IND     | <a href="#"><u>SARAL</u></a>             | A | <a href="#"><u>2772</u></a> | <a href="#"><u>view</u></a> |
| IND     | <a href="#"><u>IRS-NEMO-AM</u></a>       | A | <a href="#"><u>2787</u></a> | <a href="#"><u>view</u></a> |
| IND     | <a href="#"><u>IRS-NG14</u></a>          | A | <a href="#"><u>2844</u></a> | <a href="#"><u>view</u></a> |
| IND     | <a href="#"><u>IRS-SCATSAT-1</u></a>     | A | <a href="#"><u>2849</u></a> | <a href="#"><u>view</u></a> |
| IND     | <a href="#"><u>INS-1</u></a>             | A | <a href="#"><u>2855</u></a> | <a href="#"><u>view</u></a> |
| IND     | <a href="#"><u>CARTOSAT-2S</u></a>       | A | <a href="#"><u>2863</u></a> | <a href="#"><u>view</u></a> |
| IND     | <a href="#"><u>IUSAT-H2</u></a>          | A | <a href="#"><u>2863</u></a> | <a href="#"><u>view</u></a> |
| IND     | <a href="#"><u>MICROSAT-TD-1</u></a>     | A | <a href="#"><u>2866</u></a> | <a href="#"><u>view</u></a> |
| IND     | <a href="#"><u>LMI</u></a>               | A | <a href="#"><u>2867</u></a> | <a href="#"><u>view</u></a> |
| IND     | <a href="#"><u>HYSIS</u></a>             | A | <a href="#"><u>2872</u></a> | <a href="#"><u>view</u></a> |
| IRN     | <a href="#"><u>DOUSTI</u></a>            | A | <a href="#"><u>2872</u></a> | <a href="#"><u>view</u></a> |
| ISR     | <a href="#"><u>NSL-2</u></a>             | A | <a href="#"><u>2868</u></a> | <a href="#"><u>view</u></a> |
| J       | <a href="#"><u>ALOS</u></a>              | N | <a href="#"><u>2627</u></a> | <a href="#"><u>view</u></a> |

|     |                                      |   |                      |                      |
|-----|--------------------------------------|---|----------------------|----------------------|
| J   | <a href="#">SOCRATES</a>             | A | <a href="#">2737</a> | <a href="#">view</a> |
| J   | <a href="#">GRUS</a>                 | A | <a href="#">2856</a> | <a href="#">view</a> |
| KOR | <a href="#">KOMPSAT-3-1</a>          | A | <a href="#">2913</a> | <a href="#">view</a> |
| KOR | <a href="#">KOMPSAT-7-1</a>          | A | <a href="#">2913</a> | <a href="#">view</a> |
| LTU | <a href="#">M6P</a>                  | A | <a href="#">2875</a> | <a href="#">view</a> |
| LUX | <a href="#">MINAS</a>                | A | <a href="#">2880</a> | <a href="#">view</a> |
| LUX | <a href="#">TRITON-X-LIS</a>         | A | <a href="#">2905</a> | <a href="#">view</a> |
| LVA | <a href="#">VENTA-1</a>              | A | <a href="#">2761</a> | <a href="#">view</a> |
| LVA | <a href="#">VENTA-2</a>              | A | <a href="#">2817</a> | <a href="#">view</a> |
| MRC | <a href="#">MOHAMMED VI<br/>- AB</a> | A | <a href="#">2792</a> | <a href="#">view</a> |
| MRC | <a href="#">MOHAMMED VI<br/>- AB</a> | N | <a href="#">2866</a> | <a href="#">view</a> |
| NOR | <a href="#">NORSAT-1</a>             | A | <a href="#">2815</a> | <a href="#">view</a> |
| NOR | <a href="#">NORSAT-H1</a>            | A | <a href="#">2839</a> | <a href="#">view</a> |
| NOR | <a href="#">HEIMDALL-1</a>           | A | <a href="#">2880</a> | <a href="#">view</a> |
| NOR | <a href="#">TYVAK-1012</a>           | A | <a href="#">2888</a> | <a href="#">view</a> |
| NOR | <a href="#">NORSAT-2</a>             | A | <a href="#">2891</a> | <a href="#">view</a> |
| NOR | <a href="#">TYVAK-182A</a>           | A | <a href="#">2905</a> | <a href="#">view</a> |
| NOR | <a href="#">TYVAK-1005</a>           | A | <a href="#">2909</a> | <a href="#">view</a> |

|     |                              |   |                      |                      |
|-----|------------------------------|---|----------------------|----------------------|
| NZL | <a href="#">ELECTRONNZ-3</a> | A | <a href="#">2909</a> | <a href="#">view</a> |
| PAK | <a href="#">PAKTES-1</a>     | A | <a href="#">2751</a> | <a href="#">view</a> |
| PAK | <a href="#">PAKTES-1B</a>    | A | <a href="#">2791</a> | <a href="#">view</a> |
| PAK | <a href="#">PRSS-O1R</a>     | A | <a href="#">2865</a> | <a href="#">view</a> |
| PAK | <a href="#">PAKTES-1</a>     | N | <a href="#">2885</a> | <a href="#">view</a> |
| PNG | <a href="#">MICRONSAT</a>    | A | <a href="#">2899</a> | <a href="#">view</a> |
| POL | <a href="#">SWIATOWID 2</a>  | A | <a href="#">2896</a> | <a href="#">view</a> |
| POL | <a href="#">REC</a>          | A | <a href="#">2906</a> | <a href="#">view</a> |
| RUS | <a href="#">SMOTR</a>        | A | <a href="#">2865</a> | <a href="#">view</a> |
| RUS | <a href="#">PROGNOZ-N</a>    | A | <a href="#">2902</a> | <a href="#">view</a> |
| RUS | <a href="#">UCTS-ISS</a>     | N | <a href="#">2906</a> | <a href="#">view</a> |
| RUS | <a href="#">RLB</a>          | A | <a href="#">2910</a> | <a href="#">view</a> |
| SNG | <a href="#">COLUGO</a>       | A | <a href="#">2862</a> | <a href="#">view</a> |
| SUI | <a href="#">ACN</a>          | A | <a href="#">2896</a> | <a href="#">view</a> |
| SVN | <a href="#">NEMO-HD</a>      | A | <a href="#">2780</a> | <a href="#">view</a> |
| SVN | <a href="#">TRISAT</a>       | A | <a href="#">2874</a> | <a href="#">view</a> |
| THA | <a href="#">RTAFSAT</a>      | A | <a href="#">2903</a> | <a href="#">view</a> |
| UAE | <a href="#">KHALIFASAT</a>   | A | <a href="#">2839</a> | <a href="#">view</a> |

|       |                               |   |                      |                      |
|-------|-------------------------------|---|----------------------|----------------------|
| UKR   | <a href="#">EAGLE OWL</a>     | A | <a href="#">2898</a> | <a href="#">view</a> |
| UKR   | <a href="#">SICH-2M</a>       | A | <a href="#">2908</a> | <a href="#">view</a> |
| USA   | <a href="#">P92-1</a>         | N | <a href="#">2593</a> | <a href="#">view</a> |
| USA   | <a href="#">P92-2</a>         | N | <a href="#">2593</a> | <a href="#">view</a> |
| USA   | <a href="#">PROMETHEUS-B1</a> | A | <a href="#">2806</a> | <a href="#">view</a> |
| USA   | <a href="#">P92-1A</a>        | A | <a href="#">2811</a> | <a href="#">view</a> |
| USA   | <a href="#">P92-2A</a>        | A | <a href="#">2811</a> | <a href="#">view</a> |
| USA   | <a href="#">PROMETHEUS-B2</a> | A | <a href="#">2854</a> | <a href="#">view</a> |
| USA   | <a href="#">LEMUR-2-3</a>     | A | <a href="#">2867</a> | <a href="#">view</a> |
| USA   | <a href="#">P92-1A</a>        | N | <a href="#">2875</a> | <a href="#">view</a> |
| USA   | <a href="#">P92-2A</a>        | N | <a href="#">2876</a> | <a href="#">view</a> |
| USA   | <a href="#">USMIG</a>         | A | <a href="#">2880</a> | <a href="#">view</a> |
| USA   | <a href="#">USASAT-30G</a>    | A | <a href="#">2906</a> | <a href="#">view</a> |
| USA   | <a href="#">USASAT-30J</a>    | A | <a href="#">2908</a> | <a href="#">view</a> |
| USA   | <a href="#">EOS PM</a>        | A | <a href="#">2913</a> | <a href="#">view</a> |
| USA   | <a href="#">PATHFINDER</a>    | A | <a href="#">2913</a> | <a href="#">view</a> |
| VEN   | <a href="#">VRSS-1</a>        | N | <a href="#">2742</a> | <a href="#">view</a> |
| <hr/> |                               |   |                      |                      |

|               |  |            |
|---------------|--|------------|
| <b>TOTAL:</b> |  | <b>167</b> |
|---------------|--|------------|

**ENTRIES HAVING NO CONFLICT:**

| <b>No.</b> | <b>Notifying Administration</b> | <b>Satellite Name</b> | <b>NOTIF. REASON</b> | <b>Reason for no conflict</b>                       |
|------------|---------------------------------|-----------------------|----------------------|-----------------------------------------------------|
| <hr/>      |                                 |                       |                      |                                                     |
| <b>1</b>   | <b>CAN</b>                      | <b>SAPPHIRE</b>       | <b>N</b>             | <b>Transaction Completely Removed</b>               |
| <b>2</b>   | <b>CHN</b>                      | <b>COMPASS-H</b>      | <b>U</b>             | <b>Transaction Completely Removed</b>               |
| <b>3</b>   | <b>CHN</b>                      | <b>COMPASS-M</b>      | <b>U</b>             | <b>Transaction Completely Removed</b>               |
| <b>4</b>   | <b>CHN</b>                      | <b>CE-1</b>           | <b>N</b>             | <b>Transaction Completely Removed</b>               |
| <b>5</b>   | <b>CHN</b>                      | <b>SHENZHOU</b>       | <b>N</b>             | <b>Transaction Completely Removed</b>               |
| <b>6</b>   | <b>CHN</b>                      | <b>NUAA-1</b>         | <b>N</b>             | <b>Transaction Completely Removed</b>               |
| <b>7</b>   | <b>CHN</b>                      | <b>LUNAR CTDRS-1</b>  | <b>A</b>             | <b>Lunar Mission</b>                                |
| <b>8</b>   | <b>CHN</b>                      | <b>ZHOB-1</b>         | <b>A</b>             | <b>No common Earth-Stations</b>                     |
| <b>9</b>   | <b>CHN</b>                      | <b>ZJ-1</b>           | <b>N</b>             | <b>No common Earth-Stations</b>                     |
| <b>10</b>  | <b>CHN</b>                      | <b>TIANWANG</b>       | <b>N</b>             | <b>No common Earth-Sations, intersatellite link</b> |
| <b>11</b>  | <b>CHN</b>                      | <b>TIANGONG</b>       | <b>A</b>             | <b>No common Earth-Sations</b>                      |

|    |         |                   |   |                                   |
|----|---------|-------------------|---|-----------------------------------|
| 12 | D       | RAPIDEYE          | N | Transaction Completely Removed    |
| 13 | F / ESA | SOHO              | N | Transaction Completely Removed    |
| 14 | F / GLS | MSATNAV-2         | N | Transaction Completely Removed    |
| 15 | F / GLS | MSATNAV-3         | N | Transaction Completely Removed    |
| 16 | F / GLS | MSATNAV-4         | N | Transaction Completely Removed    |
| 17 | F / ESA | CLUSTER 1-5       | N | No common Earth-Stations          |
| 18 | G       | REMDEB            | A | No common Earth-Stations          |
| 19 | G       | DT1               | A | No common Earth-Stations          |
| 20 | I / GLS | GALILEO-M-NAVSTAR | N | Transaction Completely Removed    |
| 21 | J       | ALOS              | N | Transaction Completely Removed    |
| 22 | MRC     | MOHAMMED VI - AB  | A | No common Earth-Stations          |
| 23 | PAK     | PAKTES-1          | N | No common Earth-Stations          |
| 24 | RUS     | UCTS-ISS          | N | Only intersatellite communication |
| 25 | RUS     | RLB               | A | Only intersatellite communication |
| 26 | UAE     | KHALIFASAT        | A | No common Earth-Stations          |
| 27 | USA     | P92-1             | N | No common Earth-Stations          |

|           |            |               |          |                                           |
|-----------|------------|---------------|----------|-------------------------------------------|
| <b>28</b> | <b>USA</b> | <b>P92-2</b>  | <b>N</b> | <b>Transaction Completely<br/>Removed</b> |
| <b>29</b> | <b>USA</b> | <b>P92-1A</b> | <b>A</b> | <b>No common Earth-<br/>Stations</b>      |
| <b>30</b> | <b>USA</b> | <b>P92-2A</b> | <b>A</b> | <b>No common Earth-<br/>Stations</b>      |
| <b>31</b> | <b>VEN</b> | <b>VRSS-1</b> | <b>N</b> | <b>Transaction Completely<br/>Removed</b> |