

**Exhibit C – Canadian Licenses**  
**FCC Form 312 – Modification Application**  
**Applicant:** Kongsberg Satellite Services AS  
**Call Sign:** E160028

Enclosed is the Radio License and Spectrum License for M3MSat/exactView-7 satellite from Innovation, Science, and Economic Development Canada (“ISED”), the department responsible for spectrum management. While the Canadian Department of National Defense is the satellite owner and ISED licensee, exactEarth is the operator of the satellite AIS payload. The license renewal is in progress.



235 Queen Street  
Ottawa, Ontario  
K1A 0H5

**JUN 21 2016**

**RADIO LICENCE**

Our File: 3150-1 (695765 CP)

Mr. James Bronson  
A/ DND Frequency Spectrum Manager  
Department of National Defence  
101 Colonel By Drive  
Ottawa, Ontario  
K1A 0K2

Dear Mr. Bronson:

This letter constitutes a radio licence for the operation of the M3MSat satellite for the purposes of AIS related activities and for low data rate services in the frequency bands as outlined in the table below:

Frequency Bands/Frequencies	Use
399.9-400.05 MHz (Earth-to-space)	Low Data Rate Service (developmental)
400.15-401 MHz (space-to-Earth)	Low Data Rate Service (developmental)
2025-2110 MHz (Earth-to-space)	Telemetry, tracking and control
2200-2290 MHz (space-to-Earth)	Telemetry, tracking and control
5150-5250 (space-to-Earth)	Transmit AIS and developmental LDRS data

This licence is valid from June 22, 2016 to March 31, 2017, and is subject to the conditions outlined in the attachment.

In keeping with our commitment to open, fair and transparent licensing processes, this licence may be posted on the Department's spectrum and telecommunications website. If you have any questions regarding this letter, please contact me at (343) 291-1969 or Shari Scott at (613) 986-0017.

Yours sincerely,

Suzanne Lambert,  
Director, Space Services Operations

Attachment

## **Attachment A**

### **Department Of National Defence** **Conditions of Licence for the Use of Radio Spectrum** **by the M3MSAT Satellite in a Non-Geostationary Satellite Orbit**

#### **Eligibility**

1. The licensee must comply with the eligibility criteria as set out in the *Radiocommunication Regulations*.

#### **Licence Transferability**

2. Licences may not be transferred or assigned without a full review of the request by Industry Canada, and are subject to the authorization of the Minister. For clarification and without limiting the generality of the foregoing, “transfer” includes any leasing, sub-leasing or other disposition of the rights and obligations of the licence, and also includes any change that would have a material effect on the ownership or control in fact of the licensee.

#### **Laws and Regulations**

3. The licensee and its use of the spectrum assigned in this authorization are subject to and must comply with the ITU *Radio Regulations*, the Canadian *Radiocommunication Act*, the Canadian *Radiocommunication Regulations*, and Canada’s spectrum utilization policies pertaining to the authorized radio frequency bands and satellite orbit.

#### **Canadian Direction and Control**

4. The licensee must maintain direction and control of the satellite(s) at all times. If primary control is located outside of Canada, the licensee must maintain a secondary facility located in Canada that is capable of the functions listed in Client Procedures Circular 2-06-02 (CPC-2-6-02) – *Licensing of Space Stations*.

#### **Relocation of a Satellite(s)**

5. The satellite may not be relocated without a full review of the request by Industry Canada and the authorization of the Minister.

#### **Implementation Milestone**

6. DND shall place the satellite in the authorized orbit by December 31, 2016.

### **International Coordination**

7. It is the responsibility of the licensee to participate, on an ongoing basis, in coordination activities with a view to protecting its network and fulfilling ITU obligations. To this end, the licensee must undertake the following: participate, at its own expense, in the coordination of the satellite network with the satellite and terrestrial networks of other countries; provide Industry Canada, in a manner acceptable to the ITU, with the satellite coordination, notification and administrative due diligence information required by the ITU; pay the applicable ITU cost recovery charges for satellite network filings; and ensure that the operation of the satellite complies with any arrangements and agreements undertaken by Canada with respect to the coordination of the satellite.
8. The licensee must maintain a valid ITU filing associated with the satellite system or network at all times.

### **Domestic Coordination**

9. In order to avoid harmful interference, the licensee will be required to coordinate its satellite network/system with other potentially affected Canadian satellite and terrestrial services, and the satellite or satellite system must be operated in a manner consistent with any arrangements made to facilitate domestic satellite coordination.
10. In the event that coordination cannot be completed between licensees, the Department may impose the implementation of mitigation techniques, taking into account all relevant factors including, without limitation, the order of domestic authorization. The licensee must ensure that the operation of its satellite system complies with all measures imposed by the Department.

### **Information Requirements**

11. At the Department's request, the licensee must provide all necessary information to a licence applicant to facilitate the coexistence analysis for the Department's consideration, as part of that applicant's licence application. Such information must be provided within a reasonable timeframe.

### **Operating Requirements**

12. In the band 399.9-400.05 MHz, the mobile-satellite service must not constrain the development and use of the radionavigation-satellite service.

13. In the band 400.15-401 MHz, DND must take all practical steps to protect the radio astronomy service in the bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz, and 608-614 MHz from harmful interference from unwanted emissions. The threshold levels of interference detrimental to the radio astronomy service are shown in ITU-R Resolution 739.
14. In the band 400.15-401 MHz (space to Earth), DND must respect the power flux density limits indicated set out in the ITU *Radio Regulations* Annex 1 of Appendix 5.
15. In the band 5150-5216 MHz (space to Earth), the power flux-density at the Earth's surface produced by space stations operating in the space-to-Earth direction shall not exceed -164 dB(W/m<sup>2</sup>) in any 4 kHz band for all angles of arrival.

#### **Provision of Service**

16. The satellite must be in-service within 6 months of reaching its authorized orbit, and must maintain operations in accordance with the international *Radio Regulations*, its associated ITU filings and domestic authorization.

#### **Space Debris Mitigation**

17. DND must implement space debris mitigation measures in accordance with the guidelines established by the Inter-Agency Space Debris Coordination Committee, including the requirement for the satellites to de-orbit within 25 years of end of operational life.

#### **Earth Station Licensing**

18. All earth stations in Canada communicating with the satellite, except those exempted from the licensing requirement pursuant to the *Radiocommunication Act* and *Radiocommunication Regulations*, shall be licensed prior to operation pursuant to Client Procedures Circular, CPC-2-6-01, *Procedure for the Submission of Applications to License Fixed Earth Stations and to Approve the Use of Foreign Satellites in Canada*.

#### **Satellite Licensing Information**

19. DND shall obtain spectrum licences for the use of spectrum aboard the M3MSat space station related to the reception of AIS signals.
20. DND shall obtain space station radio licences for the transmission of AIS data, for the feederlinks related to the low data rate system (LDRS) service, and for the reception and transmission of TT&C signals prior to commencement of operations. To this end, DND must submit the administrative licensing information, set out in Annex C of Client Procedures Circular (CPC-2-6-02), *Licensing of Space Stations*, at least 30 days in advance of the anticipated launch date of the satellite.

21. DND shall obtain developmental radio licences for the provision of the LDRS service using the bands 399 MHz and 400 MHz prior to commencement of operations. To this end, DND shall submit the administrative licensing information, set out in Annex C of CPC-2-6-02 at least 30 days in advance of the anticipated launch date of the satellites.

### **Reporting Requirements**

22. The licensee is required to immediately report changes to its contact information or to information concerning its satellite operations and/or control facilities to Industry Canada.
23. The licensee shall submit an annual report for each year of operation, indicating continued compliance with these conditions. This report is due March 31<sup>st</sup> of each year.
24. The licensee shall notify the Department when a satellite is decommissioned or de-orbited.
25. At the end of life of the satellite, the licensee shall submit a final report to the Department detailing the space debris mitigation measures undertaken . This report shall be submitted within 60 business days of the end of life of the satellite.
26. The licensee shall provide any information requested by the Department, within the timeframe established in the request.
27. All reports are to be submitted to the Manager, Satellite Authorization Policy at [IC.satelliteauthorization-autorisationsatellite.IC@canada.ca](mailto:IC.satelliteauthorization-autorisationsatellite.IC@canada.ca)

### **Payment of Fees**

28. Licence fees are paid on an annual basis in advance, and are due by March 31 of each year.

### **Licence Term**

29. This is an annual licence, renewable on March 31<sup>st</sup> of every year.



235 Queen Street  
Ottawa, Ontario  
K1A 0H5

## SPECTRUM LICENCE

JUN 21 2016

Our file: 3150-1 (695769 CP)

Mr. James Bronson  
A/ DND Frequency Spectrum Manager  
Department of National Defence  
101 Colonel By Drive  
Ottawa, Ontario  
K1A 0K2

Dear Mr. Bronson:

This letter constitutes a spectrum licence granting the Department of National Defence authority to use the M3MSat low earth orbit satellite to receive the following radio frequencies for the provision of its mobile satellite services in Canada, in particular for the space-based reception of maritime Automatic Identification System (AIS) signals.

Frequency Bands/Frequencies	Use
161.9625-161.9875 MHz (Earth-to-space) and 162.0125-162.0375 MHz (Earth-to-space)	Receive AIS signals

This is an annual licence subject to the conditions set out in the attachment. This licence expires on March 31<sup>st</sup>, 2017.

Sincerely,

Suzanne Lambert  
Director,  
Space Services Operations

Attachment

## Attachment A

**Department Of National Defence**  
**Conditions of Licence for the Use of Radio Spectrum**  
**by the M3MSAT Satellite in a Non-Geostationary Satellite Orbit**

### Eligibility

1. The licensee must comply with the eligibility criteria as set out in the *Radiocommunication Regulations*.

### Licence Transferability

2. Licences may not be transferred or assigned without a full review of the request by Industry Canada, and are subject to the authorization of the Minister. For clarification and without limiting the generality of the foregoing, “transfer” includes any leasing, sub-leasing or other disposition of the rights and obligations of the licence, and also includes any change that would have a material effect on the ownership or control in fact of the licensee.

### Laws and Regulations

3. The licensee and its use of the spectrum assigned in this authorization are subject to and must comply with the ITU *Radio Regulations*, the Canadian *Radiocommunication Act*, the Canadian *Radiocommunication Regulations*, and Canada’s spectrum utilization policies pertaining to the authorized radio frequency bands and satellite orbit.

### Canadian Direction and Control

4. The licensee must maintain direction and control of the satellite(s) at all times. If primary control is located outside of Canada, the licensee must maintain a secondary facility located in Canada that is capable of the functions listed in Client Procedures Circular 2-06-02 (CPC-2-6-02) – *Licensing of Space Stations*.

### Relocation of a Satellite(s)

5. The satellite may not be relocated without a full review of the request by Industry Canada and the authorization of the Minister.

### Implementation Milestone

6. DND shall place the satellite in the authorized orbit by December 31, 2016.



### **International Coordination**

7. It is the responsibility of the licensee to participate, on an ongoing basis, in coordination activities with a view to protecting its network and fulfilling ITU obligations. To this end, the licensee must undertake the following: participate, at its own expense, in the coordination of the satellite network with the satellite and terrestrial networks of other countries; provide Industry Canada, in a manner acceptable to the ITU, with the satellite coordination, notification and administrative due diligence information required by the ITU; pay the applicable ITU cost recovery charges for satellite network filings; and ensure that the operation of the satellite complies with any arrangements and agreements undertaken by Canada with respect to the coordination of the satellite.
8. The licensee must maintain a valid ITU filing associated with the satellite system or network at all times.

### **Domestic Coordination**

9. In order to avoid harmful interference, the licensee will be required to coordinate its satellite network/system with other potentially affected Canadian satellite and terrestrial services, and the satellite or satellite system must be operated in a manner consistent with any arrangements made to facilitate domestic satellite coordination.
10. In the event that coordination cannot be completed between licensees, the Department may impose the implementation of mitigation techniques, taking into account all relevant factors including, without limitation, the order of domestic authorization. The licensee must ensure that the operation of its satellite system complies with all measures imposed by the Department.

### **Information Requirements**

11. At the Department's request, the licensee must provide all necessary information to a licence applicant to facilitate the coexistence analysis for the Department's consideration, as part of that applicant's licence application. Such information must be provided within a reasonable timeframe.

### **Operating Requirements**

12. In the band 399.9-400.05 MHz, the mobile-satellite service must not constrain the development and use of the radionavigation-satellite service.

13. In the band 400.15-401 MHz, DND must take all practical steps to protect the radio astronomy service in the bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz, and 608-614 MHz from harmful interference from unwanted emissions. The threshold levels of interference detrimental to the radio astronomy service are shown in ITU-R Resolution 739.
14. In the band 400.15-401 MHz (space to Earth), DND must respect the power flux density limits indicated set out in the ITU *Radio Regulations* Annex 1 of Appendix 5.
15. In the band 5150-5216 MHz (space to Earth), the power flux-density at the Earth's surface produced by space stations operating in the space-to-Earth direction shall not exceed -164 dB(W/m<sup>2</sup>) in any 4 kHz band for all angles of arrival.

#### **Provision of Service**

16. The satellite must be in-service within 6 months of reaching its authorized orbit, and must maintain operations in accordance with the international *Radio Regulations*, its associated ITU filings and domestic authorization.

#### **Space Debris Mitigation**

17. DND must implement space debris mitigation measures in accordance with the guidelines established by the Inter-Agency Space Debris Coordination Committee, including the requirement for the satellites to de-orbit within 25 years of end of operational life.

#### **Earth Station Licensing**

18. All earth stations in Canada communicating with the satellite, except those exempted from the licensing requirement pursuant to the *Radiocommunication Act* and *Radiocommunication Regulations*, shall be licensed prior to operation pursuant to Client Procedures Circular, CPC-2-6-01, *Procedure for the Submission of Applications to License Fixed Earth Stations and to Approve the Use of Foreign Satellites in Canada*.

#### **Satellite Licensing Information**

19. DND shall obtain spectrum licences for the use of spectrum aboard the M3MSat space station related to the reception of AIS signals.
20. DND shall obtain space station radio licences for the transmission of AIS data, for the feederlinks related to the low data rate system (LDRS) service, and for the reception and transmission of TT&C signals prior to commencement of operations. To this end, DND must submit the administrative licensing information, set out in Annex C of Client Procedures Circular (CPC-2-6-02), *Licensing of Space Stations*, at least 30 days in advance of the anticipated launch date of the satellite.

21. DND shall obtain developmental radio licences for the provision of the LDRS service using the bands 399 MHz and 400 MHz prior to commencement of operations. To this end, DND shall submit the administrative licensing information, set out in Annex C of CPC-2-6-02 at least 30 days in advance of the anticipated launch date of the satellites.

### **Reporting Requirements**

22. The licensee is required to immediately report changes to its contact information or to information concerning its satellite operations and/or control facilities to Industry Canada.
23. The licensee shall submit an annual report for each year of operation, indicating continued compliance with these conditions. This report is due March 31<sup>st</sup> of each year.
24. The licensee shall notify the Department when a satellite is decommissioned or de-orbited.
25. At the end of life of the satellite, the licensee shall submit a final report to the Department detailing the space debris mitigation measures undertaken . This report shall be submitted within 60 business days of the end of life of the satellite.
26. The licensee shall provide any information requested by the Department, within the timeframe established in the request.
27. All reports are to be submitted to the Manager, Satellite Authorization Policy at [IC.satelliteauthorization-autorisationsatellite.IC@canada.ca](mailto:IC.satelliteauthorization-autorisationsatellite.IC@canada.ca)

### **Payment of Fees**

28. Licence fees are paid on an annual basis in advance, and are due by March 31 of each year.

### **Licence Term**

29. This is an annual licence, renewable on March 31<sup>st</sup> of every year.