

## Kepler RSSSA

### Subject: Class exemptions

The RSSSA's current definition of a remote sensing satellite is extremely broad.<sup>1</sup> It can easily be argued that the rule includes all electromagnetic-sensitive devices in Earth orbit, including all cameras (regardless of purpose or fidelity), fine sun sensors, antennas, and even solar panels. Canada should tighten this definition, and in doing so, relax the requirements as they pertain to certain devices in such a way that does not reasonably compromise national security concerns. Kepler is of the position that national security concerns regarding auxiliary sensors on unclassified spacecraft are not substantive, including:

- All cameras below a certain surface fidelity (different fidelities might be defined for different wavelengths)
- All space science telescopes
- All devices whose clear primary function is for the transmission or receipt of data or voice information
- All devices whose clear primary function is for inspection/monitoring of the satellite bus (e.g. low-res cameras for monitoring subsystem deployment)
- All devices whose clear primary function is for operation of the satellite bus (solar panels, sun sensors, star trackers)
- All devices operating beyond Earth's orbit

To justify this, consider the following:

- All nations at minimum have access to:
  - Global public satellite imagery available online
  - 24-hour, high definition video stream from the ISS at 410 km
- In 2020, all nations of *reasonable adversarial concern* now have either the technological capability or commercial pathway to put a satellite in space. Most, if not all already have.<sup>2</sup>
- It is now trivial and inexpensive to construct a satellite with greater surface detection fidelity than all the suggested exemptions.
  - In principle, if the imaging fidelity of an orbiting device does not exceed that of an iPhone, it should not be regulated.
- Of the groups that might conceivably use intercepted imagery for purposes injurious to national security, most already have their own superior spy satellites in orbit. The exception are extranational groups. However, the possibility of injury is still dependent on:
  - Value of the imagery data in aiding harmful action taken against Canada or its allies.
    - It would need to contain sensitive surface information that is not already publicly available
  - The likelihood of interception, which is generally extremely low. This is further mitigated by observing basic security procedures.

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<sup>1</sup> From RSSSA, Section 2: "*remote sensing satellite* means a satellite that is capable of sensing the surface of the Earth through the use of electromagnetic waves."

<sup>2</sup> [https://space.skyrocket.de/directories/sat\\_c.htm](https://space.skyrocket.de/directories/sat_c.htm)

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Therefore, remote sensing licenses should only be required for systems capable of sensing the Earth at a higher fidelity than publicly available systems, provided they do not have encryption protection or a basic level of ground station security.

### **Possible exemption criteria**

#### Technical

- Exemption based on resolution limit (30 m multispectral, 15 m panchromatic, as is Landsat cutoff for publicly available imagery)
- Exemption based on revisit rate
- Exemption based on combination of the above

#### Reasonable

- Exempt devices on a case-by-case basis, with respect to the opinion of GAC and based on the estimated national security risk.
- Exemption if imagery will not be made public and certain security precautions are observed.

#### Sweeping

- Exemption of an entire class of device, without regard to its technical characteristics.
  - All cameras below a certain surface fidelity (different fidelities might be defined for different wavelengths)
  - All space science telescopes
  - All antennas whose clear primary function is for communications
  - All devices whose clear primary function is for inspection/monitoring of the satellite bus (e.g. for health or deployment)
  - All devices whose clear primary function is for essential bus operation (solar panels, sun sensors, star trackers)
  - All devices operating beyond Earth's orbit