MyRadar Satellite Network
Space Debris Mitigation Plan
Orbital Lifetime, Reentry Risk, Collision

Paul Kocyla September 16, 2021

We certify that the MyRadar satellite network will release no operational debris. The satellites will stay in one part through the whole orbital lifetime. No objects will be separated by the deployment of the antenna.

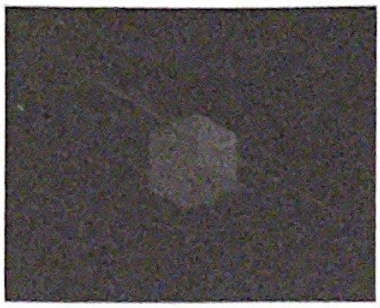
To lower the probability of accidental explosions, the satellites contain no pressure vessels, no oxidizers and no reactive materials that could cause exothermic reactions by contact with each other. To further minimize the risk of explosions, we will use flight-proven batteries, which have flight heritage in the PocketQube satellites SMOG-P and ATL-1. Battery type: two EFEST 14430 batteries.

Additionally, a venting analysis will be performed to guarantee that air can safely escape in the depressurization phase during launch. Prior to the mandatory vibration test and bakeout procedure, each module of the satellite will be tested in the lab on a modal shaker and in ultra-high vacuum. A bakeout procedure (>60°C for min. 6 hours in high vacuum) will be performed to guarantee that outgassing will stay below the required level, and functional tests after bakeout will be made to assure that the satellite will survive the launch.

To meet the requirements for the risk of collision during orbital lifetime as well as the risks of reentry, we used the Software DRAMA version 3.0.2 from the European Space Agency to perform the calculations.

- The results show an orbital lifetime of 11.6 years (without propulsion)
- Reentry analysis shows that the satellite will completely burn up during reentry
- Trackability for 1p-PocketQubes have been proven after the launch of Rocket Lab's 10th mission and studies such as the LeoLabs PocketQube Trackability Report-1.pdf approved by the FCC

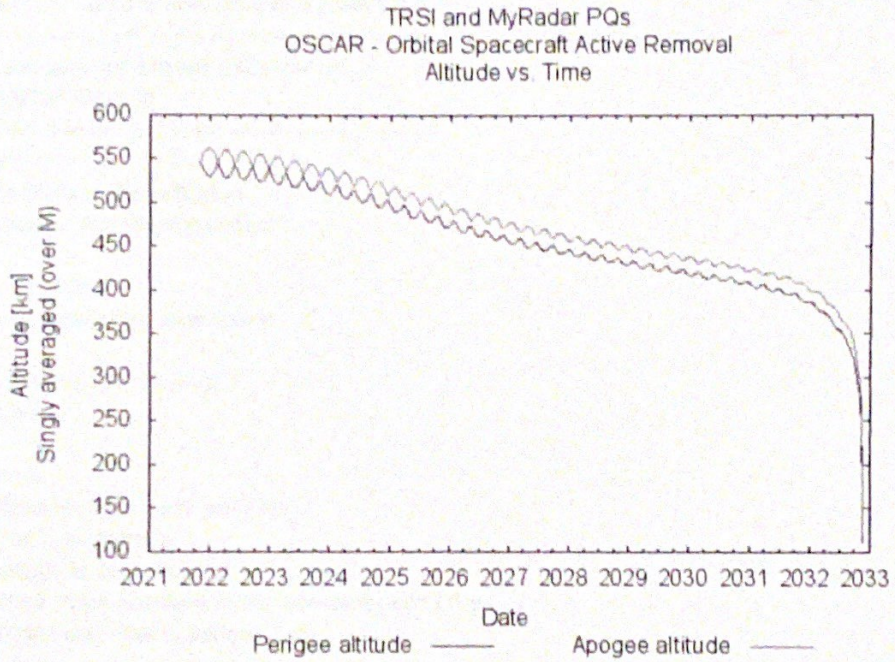
On the following pages we will present the input data we used for analysis and the corresponding results.



Except the antenna, MyRadar satellites do not have deployable structures. For the orbital lifetime analysis, we had to calculate the cross section first. The software helps by providing the calculations based on a 3D model as input. The cross-section estimation is 4800 mm2. Input parameters and results of the cross-section calculations can be found in the supporting files for DRAMA/CROC outputs.

Orbital Lifetime Analysis

Based on a 550km SSO orbit and a specified launch date in November 2021, we calculated the orbital lifetime for MyRadar satellites.



Collision Risk

We used the ARES part of the DRAMA software to calculate the annual probability of collision. The radius of the satellite has been set to 17cm to make sure that the deployed antenna is taken into the equation. The results on the next page confirm a probability smaller than 0.001 during the orbital lifetime.

```
#
#          _/_/   _/_/_/   _/_/_/_/ _/_/_/
#         _/  _/ _/  _/ _/  _/     _/
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#
#      Debris Risk Assessment and Mitigation Analysis Tool Suite
#     MASTER(-based) Assessment of Risk Event Statistics Software
#                    (DRAMA-ARES v3.0.3)
#
# ARES version:       3.0.3
# Build date:         09-Sep-20
# Platform:           x86_64-linux-gnu
# Compiler:           GNU Fortran (Debian 8.3.0-6) 8.3.0
#-------------------------------------------------------------------
# This file was generated by the ARES tool on:
# 2021/09/02 at 18:01:50
#-------------------------------------------------------------------
# Comment:
#  TRSI and MyRadar PocketQubes
#  Assessment of Risk Event Statistics
#
# ARES functionality
#  1: Collision Probability Computation
#
# Analysis epoch (yyyy/mm/dd):
# 2021/11/01
#
# Target Orbit:
#  6925.0000000 - semi major axis / km
#     0.000082 - eccentricity
#    97.000000 - inclination / deg
#     0.000000 - right ascension of the ascending node / deg
#     0.000000 - argument of perigee / deg
#
# Objects considered:
# 0.10000000E-01 - Lower Threshold / m
#  100.00000     - Upper Threshold / m
#
# Definition of radar equation
# Branch 1: Dmin(h) =      0.320 x (h/   2000.000)^(  2.0000)
# Branch 2: Dmin(h) =      0.700 x (h/  36000.000)^( -0.5000)
#
# Population clouds (1 -enabled, 0 -disabled):
# 0 - none
# 0 - none
# 0 - none
```
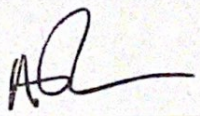

```
# 0 - none
# 0 - none
#
# Covariances used for analyses: CDM
#
# Collision probability algorithm: Alfriend-Akella
#
# Collision avoidance strategy:  Target collision probability
#
# Engine name: Cold Gas
#
# Engine specific impulse (s):    60.000000
#
#-------------------------------------------------------------
#
# title: Annual Collision Probability
#
#-------------------------------------------------------------
#
# coltitle: ACP detected population
# coltitle: ACP whole population
# coltitle: Flux due to the detected population [1/km^2/yr]
# coltitle: Flux due to the whole population [1/km^2/yr]
#
#-------------------------------------------------------------
#  ACP_d      ACP_w      Flux_d     Flux_w
#-------------------------------------------------------------
 0.2649E-04  0.3569E-04  0.1553E+02  0.1067E+03
#
#---eof-----------------------------------------------------eof---
```



Andy Green- CEO/Manager
09.16.2021