

## Obligations of the Parties to the Modified Antarctic Mapping Mission Terms and Conditions

Although both CSA and NASA realize that the RADARSAT-1 system was not designed for Interferometric observations, CSA and NASA agree to an interferometric mapping of Antarctica in right looking mode on a best efforts basis in lieu of a second south-looking Antarctic imaging campaign.

CSA will use best efforts to:

1. CSA will adopt best efforts to provide a complete interferometric mapping of Antarctica north of 80 degrees south called the Modified Antarctic Mapping Mission (MAMM), where:
  - (a) The ideal MAMM consists of a 3 cycle (72 day) plan to be executed in the fall of 2000.
  - (b) The interferometric mapping may have to be completed in the fall 2001 i.e. to fill holes in the 2000 acquisition plan only, provided the interferometric value of the already acquired data is demonstrated.
2. MAMM is to be completed using SAR on-time allocation over and above the existing US allocation up to a ceiling of 4,750 min., whether used in 2000 or in 2001 or a combination of 2000 and 2001. Any consumption beyond this limit is either to come from the existing US allocation or to be purchased commercially.
3. CSA will adopt an orbit maintenance strategy, in consultation with NASA, to optimize the chance of achieving interferometric coverage.
  - (a) Aim for a control band of +/- 1km and if possible a target of +/-500m at the equator to help achieve the desired 250m baseline over Antarctica for Standard Beam InSAR. Orbit maintenance should compensate for the possibility that drag will be lower than expected. However, the orbit control manoeuvres will not be required to be more frequent than once per eight days. Due to unpredictable drag, there is no guarantee that the orbit will remain within the desired targeted result.
  - (b) Orbit maintenance strategy test and verification to be supported during August, 2000, to determine ability to control orbits to within required baseline. Note that no orbit control changes can start before the end of the eclipse season.
  - (c) CSA will attempt to improve orbit determination accuracy through the use of additional TT&C coverage available through DSN.
  - (d) CSA will provide existing orbit-related information to NASA before and during the mission: orbital parameters, drag coefficient, projected area for drag, maneuver design details, maneuver performance results, expected post-maneuver ground track, tracking summary data, etc.
  - (e) If holes from the 2000 coverage need to be filled in 2001, the CSA will attempt the

tighter orbit maintenance strategy as required and specified in 3(a).

4. CSA will ensure that up to 650 min per cycle of OBR use for three cycles (i.e., 1950 min. of OBR use total) are available for MAMM. Should McMurdo Ground Station cease for whatever reason to be available for real time transmissions, then the CSA will offer a maximum of 1,000 min per cycle of OBR use for both MAMM and regular US allocation. The Parties recognize that the loss of McMurdo may well entail a drastically replanned and extended MAMM, which increases the difficulty in obtaining all the data required to do double-differenced interferometry.
5. CSA will cooperate in testing of MAMM procedures prior to MAMM (orbit determination, orbit maintenance, communications, data management, interferometry), to the extent feasible.
6. CSA will validate the MAMM acquisition plan before the ASF undertakes the submission of the plan to the MMO.
7. CSA will honor the following planning priorities during the mission:
  - Priority 1      Spacecraft/Payload Health and Safety
  - Priority 2      Data to assist in emergencies that have been accepted by the MMO according to guidelines that are to be developed by CSA, and approved by the ISC
  - Priority 3      Calibration Investigation and Amazon calibration images for MAMM
  - Priority 4      Time Critical Acquisitions
    - Priority 4.1      MAMM Acquisitions and Canadian Ice Services Acquisitions
    - Priority 4.2      Commercial
    - Priority 4.3      Non-commercial
  - Priority 5      Non-Time Critical

The following priorities will apply to the use of the OBR during the mission:

- OBR 0      Emergencies as defined above
- OBR 1      MAMM Acquisitions
- OBR 2      Other Acquisitions

8. NASA understands that CSA recommends a target start date of September 3, 2000. An exact target date cannot be specified until reduced control band operations begin. Planned completion of MAMM to take place before December 10, 2000. Completion of additional acquisitions, if required, to take place by December 10, 2001.
9. Office space for between 1 and 3 persons to be based at CSA during the mission.
10. For product distribution, all derived products (velocities products and digital elevation

model products ) to be available to all. Image mosaic products at 125 meter resolution to be available to all. Full resolution image products to be available to approved NASA investigators and approved CSA investigators.

NASA will use best efforts to:

1. NASA will plan for MAMM, as requested by CSA, in the interests of the long-term health of RADARSAT for Canadian industry, operational monitoring and research, and will forego a south-looking imaging campaign.
2. NASA is willing to make use of the McMurdo ground station subject to its availability to the project.
3. NASA will engage for and provide tracking data from southern hemisphere stations.
4. NASA will use best efforts to measure success of interferometric operation and will replan acquisitions should the interferometric coverage not be deemed successful, in the interest of preserving resources.
5. NASA will use best efforts to minimize the impact of MAMM on other users.
6. NASA will be prudent in its choice of beams and mindful of resources.
7. NASA will publicize results from the mission as a joint NASA-CSA activity.
8. NASA will ensure that ASF transmits any non-MAMM data of CSA and RSI clients downloaded at ASF to RSI in an urgent manner after reception.

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FOR THE CANADIAN SPACE AGENCY

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FOR THE NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION

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