PACE RFI Questions & Answers

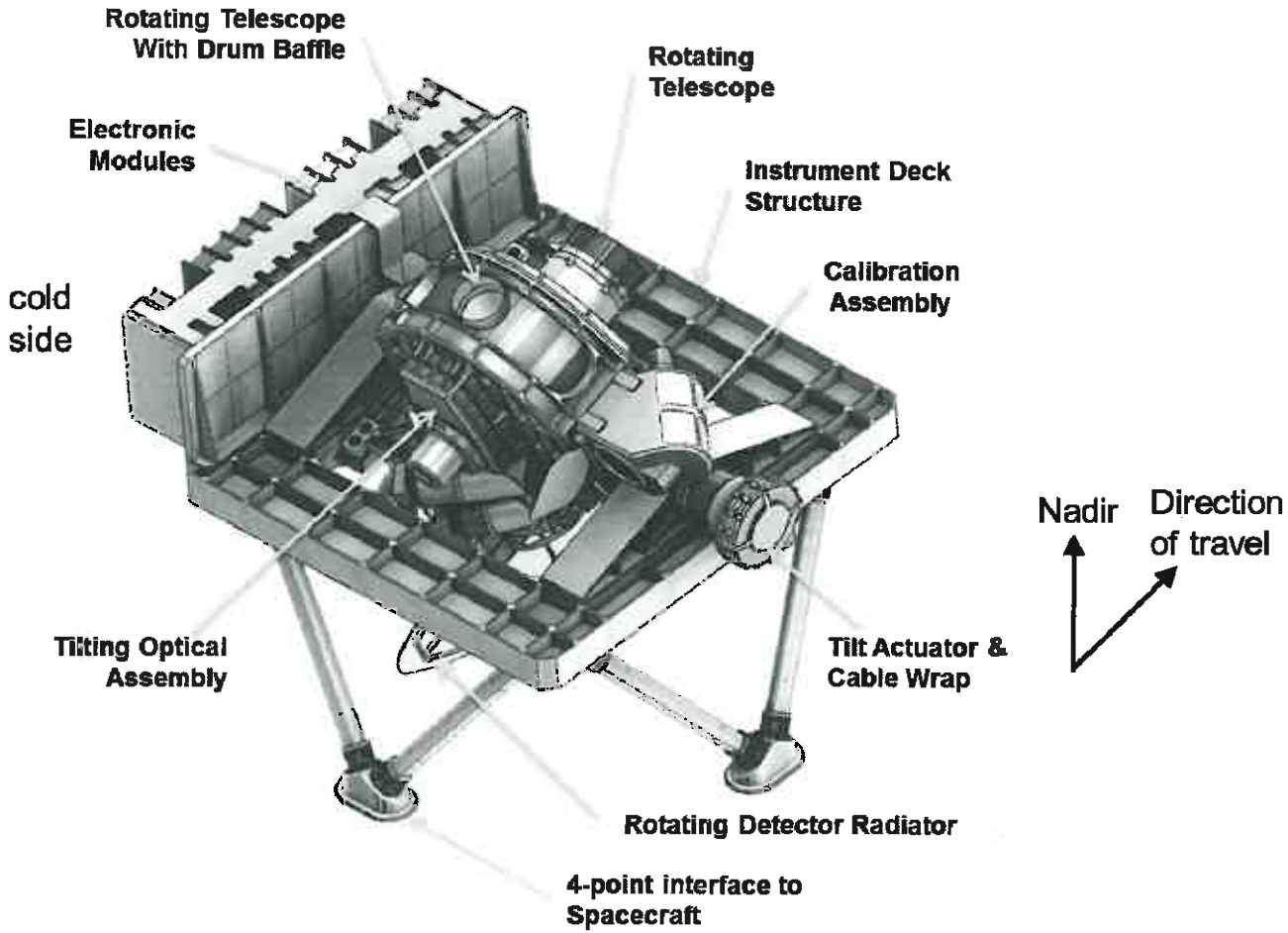
Q #	RFI Page #	RFI Section	Question	NASA Response
PACE-LM1	1	RFI Response Due Date: June 8, 2015	Due to the amount of information and the quantity of ROM price estimates requested in the RFI, we request an extension of 15 days **(June 23, 2015) to the due date for responses.**	NASA cannot extend the date of this RFI responses.
PACE-LM2	4	3.2 Mission Requirements, Communications Data Rate: 300Mbps with QPSK modulation	Communications data rate in section 6 does not match requirement listed on page 4 Mission Background Section 6.7- RF Comm Up/Downlink & Band X-band science downlink @~380Mbps. NEN currently supports up to 300 Mbps, is this acceptable?	The data rate should be 300 Mbps QPSK. (380 Mpbs does not appear in this RFI.)
PACE-LM3	5	4.1.1 Ocean Color Instrument (OCI) 1st paragraph - Additionally it will measure radiances in the Short Wave InfraRed (SWIR) range with bands centered at 940, 1240 1240, 1378, 1640, 2130 and 2250nm.	1240 is listed twice before the comma. Is a band missing or was 1240 duplicated inadvertently?	The additional 1240 is a inadvertent duplicate.
PACE-LM4	5	3.2 Mission Requirements, Spacecraft Maneuvers - The rotation rate at anti-nadir needs to be approximately 0.4 degrees/s and constant during the approximately 1.3 second Moon view.	Please provide a quantifiable error for the angular velocity during the scan.	NASA still needs to study this, but it is on the order of 5%.
PACE-LM5	5	3.2 Mission Requirements, Spacecraft Maneuvers - Once per month, OCI requires the spacecraft to pitch 360 degrees on the midnight side of the orbit so the instrument FOV scans the Moon	Is 4pi steradian COMM coverage required?	Yes, comm coverage is required during this maneuver (e.g., can be provided with low telemetry rate S-band omni antenna).

PACE-LM6	5	3.2 Mission Requirements, Spacecraft Maneuvers - In addition, once a month when the spacecraft is over a pole, there will need to be a maneuver to illuminate a solar calibration target (slew will not take the spacecraft more than 90 degrees off of its nadir pointing target).	This statement as written could be roll or pitch or a combination and any yaw. Please clarify.	It could be a combination of roll, pitch, and yaw. It is dependent on the selected instrument design.
PACE-LM7	8	CAD Model & 4.4.1 OCI Thermal - 1st paragraph - The instrument has a 0.32 m^2 thermal radiator that needs an unobstructued view to cold space…	Is the fan-shaped panel on the OCI CAD model, the 0.32 m^2 radiator panel referenced in the thermal requirements section, 3.3? If so, the panel appears to be obstructed by its own structure. Please clarify your requirement for an unobstructed view to space.	The current obstructions are known and acceptable; additional obstructions should not be added.
PACE-LM8	8-9	4.4.2 Polarimeter Thermal- 1st paragraph - The OMU temperature ranges (at mounting interfaces) are as follows: operational -10 to +40 degrees C, survival -20 to +30 degrees C, and start up -20 degrees C to +30 degrees C.	Please clarify the Polarimeter OMU survival temperature range. Survival apprears to be less than operating.	The polarimeter OMU survival temperature range is -20 to +40, and the operational temperature range is -10 to +30 degrees C.
PACE-LM9	9 10	4.5.1 OCI Electrionics and Interfaces, 1st paragraph - The OCI instrument has four electronics boxes... 4.5.2 Polarimeter Electrionics and Interfaces, 1st paragraph The polarimeter has two electronics boxes…	Can you clarify the quantity of electronics boxes for both the OCI (four or one) and Polarimeter (two or one) instruments? The descriptions vary between sections 3.4 and 6.0. Should we assume all of the electronics boxes need to be thermally coupled to the spacecraft or just a subset? Are there location	The # of electronics boxes for OCI is 4 and for the polarimeter is 1: Note: 6.0 groups all of the respective electronics boxes into a single electronics module for each instrument

	3	3.2 Mission Requirements, Payload Volume: Each instrument consists of two units: a main instrument and an electrical box	dependencies for any of these boxes?	for the purposes of describing the mass and power. However, the OCI ICDU may be moved to the spacecraftt, and the RFI had a mistake; the polarimeter Filter Wheel Control Unit is part of the OMU. The Instrument electronics boxes and heat dissipations shall be accommodated by the spacecraft. The boxes do not have any location dependencies.
PACE-LM10	9	4.5 Instrument Electronics and Interface Requirements	The SpaceWire redundancy not specified; is it single string?	SpW should be single string.
PACE-LM11	9-10	4.5.1 OCI Electronics and Interfaces, 5th paragraph - The spacecraft shall provide 28 to 34 VDC power to the OCI instrument via 4 power services.	This paragraph states two services will be 5-15A and two will be 3A. Additionally the spacecraft will provide ; two unswitched at 2A for survival. Are these each two for one or does the S/C need to provide 4 of each?	Two of each
PACE-LM12	10	4.5.1 OCI Electronics and Interfaces, 6th paragraph - While operating, the OCI will consume an orbit average of 308 Eatts of power…	Is orbit average power same for night and day or is Day higher and night lower leading to the average stated? This question applies to both the OCI and Polarimeter.	The power required is fairly consistent throughout the orbit as the operating modes do not change.

PACE-LM13	10	4.5.1 OCI Electronics and Interfaces, 6th paragraph - The survival power consumption will be 284 Watts.	The two lines for survival can only be 2Ax34v at most, is survival power consumption the sum of the six services?	The survival power comsumption is the sum of all survival services (2). The survival power consumption in the RFI will be reduced (from 248 Watts) to reflect this.
PACE-LM14	10-11	4.5.2 Polarimeter Electronics and Interfaces	The OCI command and telemetry interface is RS-422 however no command and telemetry interface is specified for the Polarimeter. Does the polarimeter use the RS-422 interface as well?	Several providers are being considered for the polarimeter, so detailed information on this instrument is not available at this time.
PACE-LM15	12	CAD model & 4.7 Instrument Packaging, Mounting & Special Handling	Can you provide orientation information for both instruments with respect to their optical and thermal fields of view?	An annotated graphic for one concept of the OCI is provided below. Several providers are being considered for the polarimeter, so detailed information on this instrument is not available at this time.
PACE-LM16	14	6.0 Operations	Can we assume TDRS will not be used for the 200Mbps link? Is it just to provide command, telemetry, and ranging	No assumptions were made about the use of TDRS. Nominal communication will be with NEN stations
PACE-LM17	14	6.0 Operations	Is real time S-band telemetry required or desired?	S-band telemetry is required.
PACE-LM18	17	8 The PACE mission would like the option to have direct broadcast science data from both the OCI and the polarimeter instruments at a rate of 30 Mbps on the sunlit portion of the orbit.	Will playbacks occur simultaneously?	Yes, they will. The direct broadcast needs to be a separate system from the RF system to communicate with the NEN stations

PCE-LM19	17	8	What is the assumed ground configuration for the direct broadcast option?	It is assumed that existing direct broadcast stations would be used. Here are the user-ground system characteristics: **Ground Antenna Diameter**: 7.62 ft **Antenna Efficiency**: 0.55 **Ground Antenna Gain**: 44.0 dB **Received Power**: -95.6 dBm **System Noise Temp**: 135K **System G/T**: 22.7 sB.K **Implementation Loss**: -2.5 dB **Received SNR - Eb/No**: 7.4 dB **Required Eb/No for 1E-8 BER**: 4.4. dB
PACE-LM20	17 6 7	8 The PACE mission would like the option to have direct broadcast science data from both the OCI and the polarimeter instruments at a rate of 30 Mbps on the 4.1.1 Ocean Color Instrument (OCI) 4th paragraph - The data is then sent to the spacecraft via Space Wire at an orbit average rate of 12Mbps. Polarimeter 3rd paragraph - The polarimeter takes data on the sunlit portion of the orbit and has an orbit average data rate of 15 Mbps via a Space Wire interface.	The data rates for the OCI and polarimeter are elsewhere defined as 12 and 15 Mbps orbit average and the direct broadcast rate is 30Mbps. Are we to assume that the actual useable orbit average is approximately 2/3 (i.e. sunlit portion of orbit) of the stated orbit averages?	The orbit average is the effective data rate and should be derated for header information and errors. Yes, it can be assumed that the actual useable orbit average is approximately 2/3 of the stated orbit average.


Rotating Telescope
With Drum Baffle
Rotating
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Structure
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Direction
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Tilting Optical
Assembly
Tilt Actuator &
Cable Wrap
Rotating Detector Radiator
4-point interface to
Spacecraft