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The following White Paper documents a proposal to replicate the instrument nadir and detector offsets from GVAR Block 11 to spare locations in Block 0 for GOES-O and beyond. The proposal has been accepted and the changes are scheduled to take effect in November 2009.

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Copying the Instrument Nadir and Detector Offsets from Block 11 to Block 0 for GOES O and Beyond

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1. Introduction

The instrument nadir and detector offsets parameters are part of the instrument factory coefficients present in block 0 for GOES I-N and in the Imager Factory Coefficients block 11 for GOES M and beyond. Because of insufficient space in block 0 to accommodate the real-time calibration information for the additional 8th infrared detector of the Imagers of GOES O and beyond, the instrument factory parameters were previously removed from the GVAR block 0 for GOES-O and beyond. Thus, the factory coefficients are present only in the GVAR Imager Factory Coefficients block 11 for GOES O and beyond.

The instrument nadir positions are important input for the instrument navigation and registration (INR). Although they are constant if a spacecraft remains in either upright or inverted (yaw flipped) position, these parameters do change if the spacecraft transitions from upright position to the inverted (yaw-flipped) position or from inverted position to the upright position. Thus, it is important to update these parameters at the start of a frame to ensure the integrity of the INR operations. This paper proposes the changes in the GVAR block 0 data to accommodate the instrument nadir position and detector offset parameters in the imager factory coefficients.

It is very important to note that these parameters are put in the spare spaces in the current GVAR block 0 for GOES O, and they are the same as those in the instrument factory coefficients in GVAR block 11. The proposed changes provide users an option to retrieve these data from GVAR block 0.

2. The Rationale for This Change

Because the nadir positions are crucial inputs for the INR operations, it is required to have guaranteed delivery at the start of a frame, and this is particularly important in the scenario that the spacecraft is transitioning from upright position to the yaw-flipped position or vice versa, in which the nadir positions will generally change as they are generally different from ideal default value. Placing these values in a GVAR block 11 does not meet the guaranteed delivery requirement. The current implementation in GVAR generation is that the instrument factory coefficients block 11 data have the lowest priority and with the condition of it being only sent at the start of a frame. Therefore, if there are other data in block 11 queue at the start of a frame, they will not be sent.

Therefore, placing these data in the block 0 enables the guaranteed delivery at the start of a frame, thus ensures the proper INR operations, in particular, the landmarking operations in the Replacement Product Monitor (RPM) system.

3. The Proposed Change

The detector offsets parameters are placed between the words 7933 to 8028, which are spares for the block 0 for GOES O and beyond. The instrument nadir parameters are placed between the words 8033 and 8038, which are also spares in block 0 for GOES O and beyond. The detailed information of their positions in GVAR block 0 is list in the following table. This table will be an extension to Table 3-6c in the DRL 504-02 documents.

Table 1 Imager Documentation Block 0 Additions for GOES O and beyond Detector Offsets and Nadir Positions. The block 0 for GOES O and beyond is document in Table 3-6c in the interface document DRL 504-02.

Word	Name	Description
7933-7934	F_VD1XO	Visible detector 1 x-offsets
7935-7936	F_VD2XO	Visible detector 2 x-offsets
7937-7938	F_VD3XO	Visible detector 3 x-offsets
7939-7940	F_VD4XO	Visible detector 4 x-offsets
7941-7942	F_VD5XO	Visible detector 5 x-offsets
7943-7944	F_VD6XO	Visible detector 6 x-offsets
7945-7946	F_VD7XO	Visible detector 7 x-offsets
7947-7948	F_VD8XO	Visible detector 8 x-offsets
7949-7950	F_PI1XO	Infrared detector 1 x-offsets
7951-7952	F_PI2XO	Infrared detector 2 x-offsets
7953-7954	F_PI3XO	Infrared detector 3 x-offsets
7955-7956	F_PI4XO	Infrared detector 4 x-offsets
7957-7958	F_PI5XO	Infrared detector 5 x-offsets
7959-7960	F_PI6XO	Infrared detector 6 x-offsets
7961-7962	F_PI7XO	Infrared detector 7 x-offsets
7963-7964	F_PI8XO	Infrared detector 8 x-offsets
7965-7966	F_RI1XO	Redundant infrared detector 1 x-offsets
7967-7968	F_RI2XO	Redundant infrared detector 2 x-offsets

7969-7970	F_RI3XO	Redundant infrared detector 3 x-offsets
7971-7972	F_RI4XO	Redundant infrared detector 4 x-offsets
7973-7974	F_RI5XO	Redundant infrared detector 5 x-offsets
7975-7976	F_RI6XO	Redundant infrared detector 6 x-offsets
7977-7978	F_RI7XO	Redundant infrared detector 7 x-offsets
7979-7980	F_RI8XO	Redundant infrared detector 8 x-offsets
7981-7982	F_VD1YO	Visible detector 1 y-offsets
7983-7984	F_VD2YO	Visible detector 2 y-offsets
7985-7986	F_VD3YO	Visible detector 3 y-offsets
7987-7988	F_VD4YO	Visible detector 4 y-offsets
7989-7990	F_VD5YO	Visible detector 5 y-offsets
7991-7992	F_VD6YO	Visible detector 6 y-offsets
7993-7994	F_VD7YO	Visible detector 7 y-offsets
7995-7996	F_VD8YO	Visible detector 8 y-offsets
7997-7998	F_PI1YO	Infrared detector 1 y-offsets
7999-8000	F_PI2YO	Infrared detector 2 y-offsets
8001-8002	F_PI3YO	Infrared detector 3 y-offsets
8003-8004	F_PI4YO	Infrared detector 4 y-offsets
8005-8006	F_PI5YO	Infrared detector 5 y-offsets
8007-8008	F_PI6YO	Infrared detector 6 y-offsets
8009-8010	F_PI7YO	Infrared detector 7 y-offsets
8011-8012	F_PI8YO	Infrared detector 8 y-offsets
8013-8014	F_RI1YO	Redundant infrared detector 1 y-offsets
8015-8016	F_RI2YO	Redundant infrared detector 2 y-offsets
8017-8018	F_RI3YO	Redundant infrared detector 3 y-offsets
8019-8020	F_RI4YO	Redundant infrared detector 4 y-offsets
8021-8022	F_RI5YO	Redundant infrared detector 5 y-offsets
8023-8024	F_RI6YO	Redundant infrared detector 6 y-offsets
8025-8026	F_RI7YO	Redundant infrared detector 7 y-offsets
8027-8028	F_RI8YO	Redundant infrared detector 8 y-offsets
8029-8032		SPARE
8033-8033	F_IOFNC	Instrument Nadir, north/south cycles
8034-8034	F_IOFEC	Instrument Nadir, east/west cycles
8035-8036	F_IOFNI	Instrument Nadir, north/south increments
8037-8038	F_IOFEI	Instrument Nadir, east/west increments

4. Reference Document

DRL 504-02 Part 1: Operations Ground Equipment Interface Specifications, Revision 2, May 2007.