ENGINEERING CHANGE ORDER Center for Astrophysics & Space Astronomy University of Colorado, Boulder				**ECO No.** COS-063 Date 2 June 2001 Sheet 1 of 3
Drawing/Document Title	Drwg/Doc No.	Revision Letter Current	 New	Special Distribution
OP-01	COS-01-0001	14	15	
				Stop Production Now ❑ Yes ❑ No

Description of Change:

1. **Page 86, section 4.1.5, item 2), first sentence:** Change 4.1.4.3 to 4.1.4.5.

2. **Page 83, section 4.1.4.5: Replace the existing text with the following text:**

The DCE FSW creates a Global Rate Monitor by routinely comparing the number of photon events counted by the Fast Event Counter (FEC) during a commandable interval against a commandable rate limit. When the count rate exceeds the limit over a given interval, then the DCE FSW autonomously changes state to **FUVHVLow**. The DCE will remain in the **FUVHVLow** state until commanded to another state. This rate is usually chosen conservatively to be just above the maximum source count rate allowed. The FEC in the FUV detector is a non-paralyzable counter and is therefore ideal for use as a rate monitor. The Global Rate monitor not only protects against over-illumination, but also the SAA, low-level coronal breakdown, field emission, etc. It also acts as a backup to the HV current monitor. So even though the detector could handle high global rates for longer than 1 second without much gain degradation, the 1-second response time must be maintained to protect the detector for unforeseen failure mechanisms.

The count rate at which HV is set to **FUVHVLow** should be set conservatively to be above the maximum allowable count rate for the detector. Rates much higher than the set point (currently set at 20,000 cts/sec per segment for ground testing) indicate a problem, either internal to the detector or due to an operational error (e.g., failure to turn HV down for SAA) and the detector HV is set to **FUVHVLow**.

Reason for Change: Updates to COS operations in OP-01.	Disposition/Effectivity				
	To Comply With ECO				
	Use As Is				
	Rework To ECO				
	Scrap And Rebuild				
	Record change Only				
	Other (See Above)				

Prepared By:	Jon Morse	Date	2 June 2001	CCB Required ❑Yes ❑No	❑Approved ❑NotApproved
Approved By:		Date			
Approved By:		Date			Immediate Incorporation
Approved By:		Date		❑Class I	
Approved By:		Date		❑Class II	❑Yes ❑No
Approved By:		Date		Completion	
Project Mgr:		Date		Date	

The Global Rate monitor algorithm in the DCE monitors the Fast Event Counter (FEC) which is the counter on the front end of the TDC electronics that counts every event detected (whether "valid" or not) without respect to x,y position on the detector. This counter is read out every second.

The shutdown algorithm can be summarized in the following way: Two parameters are used in the algorithm, trigger count C and samples N. At detector turn-on the flight software sets up rolling buffer of N elements. Each second the flight software populates an element of the rolling buffer with the FEC value for that segment and computes the average of all the values in the rolling buffer. If the average count rate exceeds C, then the detector HV is set to **FUVHVLow**. In other terms, the count rate protection algorithm compares a boxcar average against a preset value.

3. **Page 131, Table 5.3-3:** Increase the y regions for the stims to accommodate larger thermally induced drifts in the stim positions. Use the following table cells:

STIM Pulse A1	64 x 32	(310,0), (310, 31), (373, 31), (373, 0)
STIM Pulse A2	64 x 32	(15971, 992), (15971, 1023), (16034, 1023), (16034, 992)
STIM Pulse B1	64 x 32	(293, 0), (293, 31), (356, 31), (356, 0)
STIM Pulse B2	64 x 32	(15975, 992), (15975, 1023), (16038, 1023), (16038, 992)

4. **Page 102, Sec. 5.1, after the 1st paragraph and before Sec. 5.1.1:** Add the following sentences as a new paragraph:

Normal operation of the COS mechanisms will be done using “absolute moves.” The mechanism motions commanded during initial on-orbit alignment procedures will be a combination of absolute and relative moves.

5. **Page 25, replace Figure 1.3-13 with the following figure with updated MAMA event word format:**

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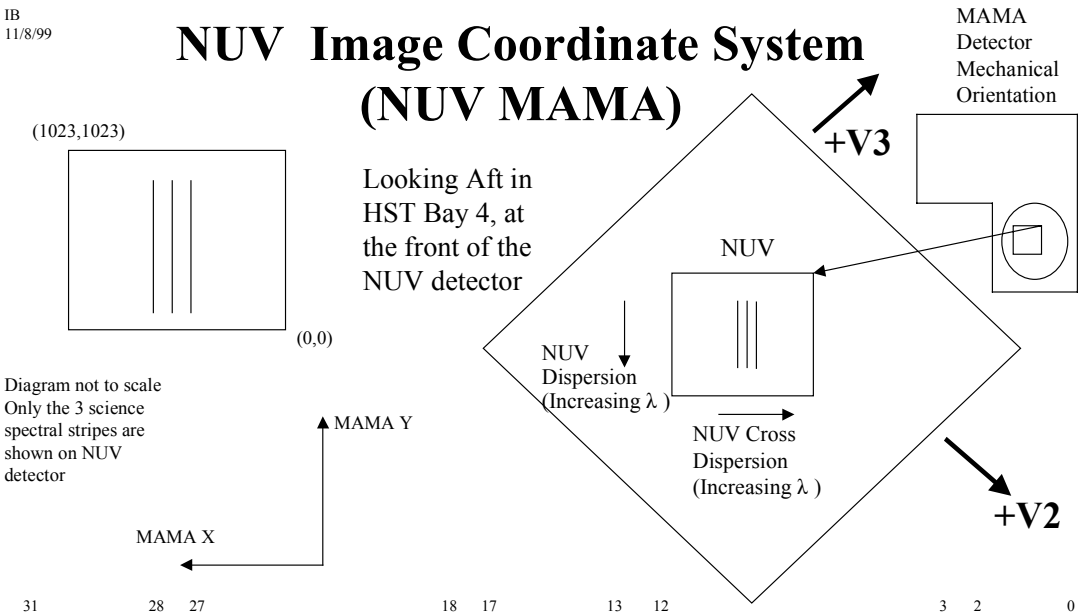
IB
11/8/99

NUV Image Coordinate System (NUV MAMA)



31–28	27–18	17–13	12–3	2–0
Zero fill (4 bits)	Cross Dispersion (10 bits) (1K pixels) MAMA X	Zero fill (5 bits)	Dispersion (10 bits) (1K pixels) MAMA Y	Sub-array ID (3 bits)

MAMA Event Word input to DIB FSW

31–27	26–17	16–12	11–2	1–0
Zero fill (5 bits)	Cross Dispersion (10 bits) (1K pixels) MAMA X	Zero fill (5 bits)	Dispersion (10 bits) (1K pixels) MAMA Y	Sub-array ID (upper 2 bits)

MAMA Event Word output by the DIB FSW to Buffer Memory