STIS Cycle 11 Calibration Plan

ID	Proposal Title	Frequency	Estimated Time (orbits)		Scheduling Required	Resources Required (FTE weeks)	Products	Accuracy Required	Notes
			"External" Prime	"Internal" & Parallel					
				CCD Monitors					
9604	CCD Performance Monitor	2 per year		42	Dec 02 Jun 03	3	CDBS, ISR, STAN	0.1 ADU, drk 0.5 e-/hr,rms 0.05e-/hr/pix	Measures bias level, read noise, CTE and gain to check the performance and commandability of CCD (only amp D).
9605 9606	CCD Dark Monitor	14 per week		760	start 9/1/02	4	CDBS	> 5%	Monitor CCD behavior and chart growth of hot and bad pixels
9607 9608	CCD Bias Monitor	daily		395	start 9/1/02	4	CDBS	0.1 ADU; rms 0.3-0.8 ADU	Track evolution of hot columns. Build high-S/N superbias.
9609	CCD Read Noise Monitor	monthly		26	start Sep 02	1	ISR	0.05 DN	For all amplifiers (A, B, C, D), full frame Gain=1, 4 binnings=1x1,1x2,2x1,2x2
9612	CCD Hot Pixel Annealing	monthly		168[a]	28-day month	3	reports; CDBS		Anneal hot pixels, track their growth.; examine CTE performance
9613	CCD Spectroscopic Flats	monthly		68		3	CDBS; ISR	<5%	Monthly for G430M; once for all other gratings at Gain=4
9614	CCD Imaging Flats	monthly		17	50CCD+LP monthly; OII, OIII every 6 months	6	CDBS; ISR	0.5% pixel-to-pixel 0.8% for OII	Investigate flat-field stability
9617	CCD Spectroscopic Dispersion Monitor	annually		7		4	CDBS; ISR	0.2 pixel	Constrain wavelength and spatial distortion maps.
9620	CCD Sparse Field CTE Internal	annually (gain 1 & 4)		96[a]	Sep 02; Sep 03	3	ISR algorithm & coeff.	1%	Measures CTE using internal cal lamps and readouts at Gains 1 & 4.
9621	CCD Sparse Field CTE External	annually	12		beginning or end of CVZ passage	4	ISR; algorithm & coeff.	1%	Measures CTE at different signal levels with varying background, amps B&D. Establish accurate correction for low count level non-linearity CTE.
9622	CCD Full-Field Sensitivity Monitor	annually	1			2	ISR, STAN	1%	Monitor CCD sensitivity over whole field of view using standard star field.

ID	Proposal Title	Frequency	Estimated Time (orbits)		Scheduling Required	Resources Required (FTE weeks)	Products	Accuracy Required	Notes
			"External" Prime	"Internal" & Parallel					
9626	Slit Wheel Repeatability	annually		1	between mar & may 03	2 days	ISR	0.1 pixel	Check stability of STIS slit wheel.
9627	CCD Spectroscopic Sensitivity Monitor	4 per year	8		every 3 to 6 months	3	CDBS, ISR, report	2%	Detect any contamination and monitor focus in imaging mode.
MAMA Monitors									
9618	MAMA Dispersion Solutions	annually		36		4	CDBS, ISR	0.1 pixel	Annual monitor of dispersion solutions. Update ground values (E230 and E140H)
9623	MAMA Full-field Sensitivity	annually	3			10	CDBS, ISR	1%	Star cluster in imaging mode. Monitor astrometric and PSF stability
9628	MAMA Sensitivity & Focus Monitor	bi-monthly	16			8	CDBS, ISR, report	2% for sens, 10% for focus	Standard star spectra at field center to monitor slit throughput; ACQ/PEAK to measure focus.
9615	MAMA Dark Monitor	twice weekly		226	2 visits each week,each det	8	CDBS, ISR	1%	Check health of MAMA detectors.
9629	MAMA Fold distribution	2 per year		4	spring and fall, each year	3 days	report, TIPS	95%	Monitor performance of MAMA microchannel plates
9624	MAMA FUV flats	annually		10	spring 03	4	CDBS, ISR	1%	Wavelength-independent pixel-to-pixel response stability
9625	MAMA NUV flats	annually		10	spring 03	4	CDBS, ISR	1%	Wavelength-independent pixel-to-pixel response stability
9630	MAMA FUV/NUV Anomalous Recovery	As needed	N/A		As needed	4 days	N/A	N/A	Permit recovery of MAMA detectors after an anomalous shutdown.
Special Calibration Programs									
9616	E1 Pseudo-Aperture Sensitivity and Throughputs	once	4		before 1/1/03	2	CDBS, ISR	2%	Check sensitivity and throughputs for CCD data taken at the E1 aperture locations
9610	Spectroscopic PSF	once	3			1	ISR		Measure the PSF through two commonly used long slits; compare to TinyTim models.

ID	Proposal Title	Frequency	Estimated Time (orbits)		Scheduling Required	Resources Required (FTE weeks)	Products	Accuracy Required	Notes
			"External" Prime	**"Internal" & Parallel**					
9611	CCD Side-2 Gain Ratio Test	once	2	2		1	CDBS, ISR	> 0.5%	Measure the ratio of Gain=4 to Gain=1 for Amp D; also for Amp B.
9631	Faint Standards Extension (FASTEX)	once	19		visits to same star separated by 4 weeks or more		new standards, paper	1-2%	Improve photometry for 2 STIS standard stars; get 3 new faint standards. Cross-calibrate with Sloan filters on ACS, COS and SDSS.
9619	Echelle Blaze Shift vs. MSM Monthly Offset	once	1		after Aug 02	3	algorithm, ISR	<1 pixel for shifts; 0.1% for sens	Empirically test models for improvement of calibration of echelle data taken when MSM offsets are enabled.
TOTAL TIME (including all executions)			**69** *C8: 135* *C9: 84* *C10:108*	**1868** *C8: 1723* *C9: 1890* *C10:1725*		**86** *C8: 168* *C9: 105* *C10: 107*	**(Total Cycle 11 STIS GO orbits: 1040)**		

[a]Parallel orbits

Proposal ID 9604: CCD Performance Monitor

Plan

Purpose	Measure the baseline performance of the CCD system.
Description	This activity measures the baseline performance and commandability of the CCD subsystem. Only primary amplifier D is used. Bias and Flat Field exposures are taken in order to measure bias level, read noise, CTE, and gain. Numerous bias frames are taken to permit construction of "super-bias" frames in which the effects of read noise have been rendered negligible. Full frame and binned observations are made, with binning factors of 2x1, 1x2, 2x2, 4x1, and 4x2. Dark images are taken in 2x2 binning mode; 1x1 binning darks are being taken in the nominal CCD Dark Monitor. Bias frames are taken in subarray readouts to check the bias level for ACQ and ACQ/PEAK observations. All exposures are internals.
Fraction GO/GTO Programs Supported	10.9%
Resources Required: Observation	42 internal orbits
Resources Required: Analysis	3 FTE weeks
Products	Possible updates of the following CDBS files: Superbias frames and Superdark frames. Possible update of the gain, bias level, and read noise values in ccdtab. Possible flight software updates of table CCDBiasSubtractionValue. Possible reports in STAN and ISR.
Accuracy Goals	Bias level: better than 0.1 ADU at any position within CCD frame; readout noise negligible. Dark current: good to 0.5 electron/hour. RMS noise level about 0.05 electron per hour per pixel. Systematic error in hot pixels may well exceed this limit.
Scheduling& Special Requirements	First set in December 2002, second set in June 2003, visits 41 to 45 in September 2002

Proposal ID’s 9605 & 9606: CCD Dark Monitor

Plan

Purpose	Monitor the darks for the STIS CCD.
Description	Obtain darks at GAIN=1 in order to monitor CCD behavior and chart growth of hot and bad pixels. Check how well the anneals work for the CCD. All exposures are internals and fit in occultation orbits
Fraction GO/GTO Programs Supported	11%
Resources Required: Observation	760 internal orbits
Resources Required: Analysis	4 FTE weeks
Products	weekly CDBS reference files (superdarks)
Accuracy Goals	> 5%
Scheduling& Special Requirements	Must seamlessly take up where 8902 leaves off; should start on September 1, 2002. Split into two proposal IDs to facilitate scheduling.

Proposal ID 9607 & 9608: CCD Bias Monitor

Plan

Purpose	Monitor the bias in the 1x1, 1x2, 2x1, and 2x2 bin settings at gain=1, and 1x1 at gain = 4, to build up high-S/N superbiases and track the evolution of hot columns.
Description	Take full-frame bias exposures in the 1x1, 1x2, 2x1, and 2x2 bin settings at gain=1, and 1x1 at gain = 4. All exposures are internals and fit in occultation orbits.
Fraction GO/GTO Programs Supported	11%
Resources Required: Observation	395 internal orbits
Resources Required: Analysis	4 FTE weeks
Products	weekly and biweekly CDBS Superbias reference files
Accuracy Goals	Bias level: better than 0.1 ADU at any position within CCD frame Superbias rms: 0.4 ADU at gain 1 1x1 0.8 ADU at gain 1 1x2,2x1,2x2 0.3 ADU at gain 4 1x1
Scheduling& Special Requirements	Must seamlessly take up where 8904 leaves off; should start on September 1, 2002. Split into two proposal IDs to facilitate scheduling.

Proposal ID 9609: CCD Read Noise Monitor

Plan

Purpose	Monitor the read noise in all of the on-chip amplifiers (A,B,C,D) to track changes affecting the STIS CCD better.
Description	This proposal measures the read noise of the STIS CCD using pairs of bias frames. All amplifiers (A, B, C, D) are used. Full frame and binned observations are made in both Gain 1 and Gain 4, with binning factors of 1x1, 1x2, 2x1 and 2x2. All exposures are internals.
Fraction GO/GTO Programs Supported	11%
Resources Required: Observation	26 internal orbits
Resources Required: Analysis	1 FTE week
Products	ISR, updates to calibration reference file.
Accuracy Goals	0.05 DN
Scheduling& Special Requirements	Monthly, starting in Sep 2002

Proposal ID 9612: CCD Hot Pixel Annealing

Plan

Purpose The effectiveness of the CCD hot pixel annealing process is assessed by measuring the dark current behavior before and after annealing and by searching for any window contamination effects. In addition CTE performance is examined by looking for traps in a low signal level spectroscopic flat. Follows on from proposals 8081/8410/8841/8906.

Description The characteristics of the CCD will first be defined by a series of Bias, Dark and flat-field exposures. The CCD Thermoelectric cooler (TEC) will then be turned off to allow the CCD detector temperature to rise (from about -80C to +5C). The CCD will be left in the uncooled state for approximately 12 hours. At the end of this period, the TEC will be turned back on and the CCD cooled down to its normal operating temperature. Bias, Dark and flat-field images will be repeated to check for changes in the CCD characteristics. Because the CCD window is on the CCD housing and not bonded to the chip, the window is actually warmest when the CCD is being cooled (because the TEC power warms the housing and coldest during the TEC-off annealing process). The flat field exposures will permit evaluation of any window contamination acquired during the annealing period. Should continue on from the monthly scheduling of program 8841.

Fraction GO/GTO Programs Supported 11%

Resources Required: Observation 168 external parallel orbits

Resources Required: Analysis 3 FTE weeks

Products Reference files, (flats, darks and biases), updates to hot pixel tables, reports and postings to the Web.

Accuracy Goals We want to anneal the STIS CCD and measure the growth rate of hot pixels.

Scheduling& Special Requirements Execute every 4th week. These long darks and the anneal itself are effectively external parallels as they preclude other uses of STIS, but allow use of other instruments.

Proposal ID 9613: CCD Spectroscopic Flats

Plan

Purpose	Obtain CCD flats on the STIS CCD in spectroscopic mode.
Description	1). Take monthly flats for one grating (G430M, 5216 Angstroms) with Gain=1 and 4. Use Tungsten lamps. 2). Monitor one grating (G750M, 6581 Angstroms) twice per year at GAIN=1. Use Tungsten lamps. The following observations are made once in the cycle at GAIN=4 3). G750L with Tungsten lamps. 4). G430L with Deuterium lamps. 5). G230MB at 2557 and 3115 Angstroms with Deuterium lamps. 6). G230LB with Deuterium lamps.
Fraction GO/GTO Programs Supported	9%
Resources Required: Observation	68 internal orbits
Resources Required: Analysis	3 FTE weeks
Products	Reference files and an ISR
Accuracy Goals	< 5%
Scheduling& Special Requirements	Monthly for G750M throughout cycle, once for all other gratings.

Proposal ID 9614: CCD Imaging Flats

Plan

Purpose	Investigate flat-field stability over a monthly period.
Description	Obtain a series of CCD flats using the MIRROR and without aperture every month to monitor the characteristics of the CCD response. Also look for the development of new cosmetic defects. Get flats for F28XOII and F28XOIII. Based on SMOV 7099. Continuation of 7634 and 8908.
Fraction GO/GTO Programs Supported	2.1%
Resources Required: Observation	17 internal orbits
Resources Required: Analysis	6 FTE weeks
Products	PFL reference files and an ISR
Accuracy Goals	0.5% pixel-to-pixel (except 0.8% for OII)
Scheduling& Special Requirements	50CCD+F28X50LP monthly (together in one orbit) throughout Cycle 11, F28XOII once per 6 months (one orbit each time), F28XOIII once per 6 months (one orbit each time)

Proposal ID 9617: CCD Spectroscopic Dispersion Monitor

Plan

Purpose	Obtain wavecals deep enough to constrain wavelength and spatial distortion maps without overusing the calibration lamp.
Description	Internal wavecals will be obtained with all 6 gratings (G230LB, G230MB, G430L, G430M, G750L, G750M) supported for use with the CCD. Data will be obtained for the nearly identical set of 38 central wavelengths used in Cycle 10 or requested in Cycle 11. All observations will be obtained with the 52x0.1 aperture, which maps to 2 pixels at the CCD. Beginning in Cycle 11, the HITM1 lamp will be used, rather than the LINE lamp. The HITM1 lamp has a more favorable spatial illumination pattern, dropping by only a factor of 3 at row 900, relative to the peak brightness at row 420. In contrast, LINE lamp brightness drops by a factor of 25 at row 900, relative to a peak brightness at row 350. Adequate illumination at row 900 is required to support use of "E1" pseudo-apertures, which place spectra at row 900 to reduce the impact of charge transfer losses during parallel transfers to the CCD readout amplifier at the top of the image. Beginning in Cycle 11, modes with weak lines will be observed with GAIN=1 to minimize the impact of read noise. Modes that require high dynamic range (G230LB, G430L, G750L, and some settings of G750M) will still be observed with GAIN=4. This program uses the HITM1 lamp for a total of 0.6 hours at a lamp current of 10 mA, consuming about 0.05% of the nominal 15000 mA-hour lamp lifetime.
Fraction GO/GTO Programs Supported	8.8%
Resources Required: Observation	7 internal orbits
Resources Required: Analysis	4 FTE weeks
Products	CCD dispersion (_dsp) reference file; ISR
Accuracy Goals	0.2 pixels; wavelength accuracy goal for row 900 of CCD
Scheduling& Special Requirements	

Proposal ID 9620: CCD Sparse Field CTE Internal

Plan

Purpose	Establish (and improve with time) an accurate correction for parallel-register CTE losses that can be used for direct analysis of science data with negligible background. Do measurements for both GAIN settings (1 and 4).
Description	The sparse-field CTE will be measured via internal calibration internal lamp observations taken through narrow slits. The strategy of the test is as follows. If there is a CTE effect, charge will be left behind as the image is shifted through pixels during readout. The further the charge needs to be shifted to be read out, the more charge it will lose. Because the D amp and the B amp read out at opposite ends of the CCD, the ratio in image intensity (B amp/D amp) should increase as the image position moves closer to the B-amp end (and further from the D-amp end). For the parallel CTE measurement, the test will use the cross-disperser slits: 0.05X29, 0.05x31NDB, and 0.05x31NDA slits, projected on different parts of the detector via special commanding of the slit wheel. The whole series of exposures are executed once for GAIN=1, and once for GAIN=4 to test the effect of different bias voltages.
Fraction GO/GTO Programs Supported	10.9%
Resources Required: Observation	96 internal orbits
Resources Required: Analysis	3 FTE weeks
Products	ISR, algorithm for calibration and coeffs.
Accuracy Goals	CTE correction coeffs will be determined to a relative 1% accuracy; photometry should not be limited by > 1% accuracy after correction for CTE.
Scheduling& Special Requirements	GAIN=1: Sep 2002 and Sep 2003; GAIN=4: Apr 2003. This is to keep monitoring at 12-month intervals. Done as parallel observations.

Proposal ID 9621: CCD Sparse Field CTE External

Plan

Purpose	Establish an accurate correction for low count level nonlinearity (CTE) that can be used for direct analysis of science data.
Description	An exploratory Cycle 7 calibration proposal (7666) has been used in the past to show that at low count levels the STIS CCD shows significant suppression of counts. The intensity and position dependence of the effect is consistent with CTE. (See Gilliland, Goudfrooij, and Kimble 1999, PASP, 1999, 111, 1009.) A number of questions/issues came up in analyzing the existing calibration data that can only be pursued with more extensive observations: (1) This program will establish a fourth epoch of a set of identical imaging and spectroscopic CTE measurements at a wide variety of object intensity and sky background levels, and hence greatly improve the functional dependences of CTE on those parameters and on-orbit time. (2) An x-dependence will be tested for. The best parts of the CTE test used in Cycles 8-10 (8415, 8854, 8911) will be retained as is. The basic technique is to observe a sparse field of stellar sources (~500-1000 by imaging a sparse field in globular cluster NGC 6752, ~50 by spectroscopy of a field in open cluster NGC 346). Exposures are cycled through at short, medium and long exposures (X5 steps). For both targets, the observations are done in the CVZ and the cycle of short-to-long exposures is repeated X3 in each CVZ orbit assuring that a subset of the exposures will be obtained at significantly higher sky background levels. Analysis consists of ratioing extracted counts at the different exposure times and seeking a solution (based on Stetson 1998, PASP, 110, 1448 equations) for CTE correction coefficients that linearizes the full set of counts. Half of the total data set will be obtained using Amp B allowing for robust measurement of the parallel CTE with a well-posed, simpler technique of comparing object counts detected with these symmetric Amps.
Fraction GO/GTO Programs Supported	10.9%
Resources Required: Observation	12 external orbits.
Resources Required: Analysis	4 FTE weeks.
Products	ISR, algorithm for calibration and coeffs.
Accuracy Goals	CTE correction coefficients will be determined to a relative 1% accuracy; photometry should not be limited by > 1% accuracy after correction for CTE.
Scheduling& Special Requirements	Visits are CVZ. WE STRONGLY DESIRE, but do not require per se that the CVZ orbits be scheduled close to the beginning or end of the CVZ passage that is limited by the bright earth angle. That is: we want part of the orbit to have as high a sky background as possible! For both Visits it would be good to set the Bright Earth Avoidance angle to 16 degrees and schedule the orbit at this limiting time. (This will make the CVZ passage larger as well, thus easing scheduling potentially.)

Proposal ID 9622: CCD Full-Field Sensitivity Monitor

Plan

Purpose	Monitor CCD sensitivity over the whole field of view.
Description	Measure a photometric standard star field in Omega Cen in 50CCD mode every year to monitor CCD sensitivity over the whole field of view. Keep the spacecraft orientation within a suitable range (+/- 5 degrees) of previous observations to keep the same stars in the same part of the CCD for every measurement. This test will give a direct transformation of the 50CCD magnitudes to the Johnson-Cousins system for red sources. These transformations should be accurate to 1%. The stability of these transformations will be measured to the sub-percent level. These observations also provide a check of the astrometric and PSF stability of the instrument over its full field of view.
Fraction GO/GTO Programs Supported	2%
Resources Required: Observation	1 external orbit
Resources Required: Analysis	2 FTE weeks
Products	ISR, STAN
Accuracy Goals	1%
Scheduling& Special Requirements	

Proposal ID 9626: Slit Wheel Repeatability

Plan

Purpose	To check the stability of the STIS slit wheel by taking a sequence of comparison lamp spectra with grating G230M (3055) and 3 different slits.
Description	Verify the repeatability of the slit wheel for 3 STIS slits (52X0.2, 52X0.1, and 52X0.05) by taking images with the Pt/Cr/Ne lamp and the MAMA detector. Use the G230M (3055) grating with the NUV-MAMA, and rotate the slit wheel among the 3 chosen slits.
Fraction GO/GTO Programs Supported	29%
Resources Required: Observation	1 internal orbit
Resources Required: Analysis	0.2 FTE weeks
Products	ISR
Accuracy Goals	0.1 pixels
Scheduling& Special Requirements	between March and May 2003

Proposal ID 9627: CCD Sensitivity Monitor

Plan

Purpose	Monitor sensitivity of each CCD grating mode to detect any change due to contamination or other causes.
Description	Obtain exposures in each of the 3 low-resolution CCD spectroscopic modes every 3 months, and in each of the 3 medium-resolution modes every 6 months, using the same high-declination calibration standard, and ratio the results to the first observations to detect any trends. Perform all exposures at both central and E1 detector positions.
Fraction GO/GTO Programs Supported	8.8%
Resources Required: Observation	8 external orbits
Resources Required: Analysis	3 FTE weeks
Products	Interim reports and ISRs on sensitivity. Wavelength-dependent trends for implementation of pipeline corrections (based on CTE).
Accuracy Goals	Minimum S/N of 50 at the wavelength of least sensitivity.
Scheduling& Special Requirements	

Proposal ID 9618: MAMA Dispersion Solutions

Plan

Purpose Obtain wavelets just deep enough to constrain wavelength and spatial distortion maps without overusing the calibration lamp.

Description For the first time on orbit, data will be obtained at all available central wavelengths. This information will help constrain global models of STIS optical performance being developed at ECF and STScI. During the observations, MSM monthly offsets will be set to zero to complement observations over the past couple of cycles, which occurred at extreme monthly offsets. The echelle observations at zero offset will yield dispersion solutions that are directly applicable to all echelle science data obtained after monthly offsets are disabled.

Internal wavecals will be obtained at all primary and secondary central wavelengths. Exposure times are taken from a table originally created by the STIS IDT. Exposure times in the table yield enough strong emission lines to constrain wavelength solutions without overusing the calibration lamp. No correction was applied for degradation in lamp brightness because spot checks of selected FUV data from program 8917 indicated that the original exposure times are still adequate. This program uses the LINE lamp for a total of 8 hours, typically at a lamp current of 10 mA, consuming about 0.5% of the 15000 mA-hour lifetime.

Fraction GO/GTO Programs Supported 17%

Resources Required: Observation 36 internal orbits

Resources Required: Analysis 4 FTE weeks

Products dispersion (_dsp) reference file; ISR

Accuracy Goals 0.1 pixels internal wavelength precision. Calstis uses auto-wavecals to determine global shifts in X and Y that are applied to wavelengths associated with science frames. Changes in dispersion with MSM monthly offset degrade the accuracy of wavelengths produced by this global shift algorithm, but more sophisticated models are being developed.

Scheduling& Special Requirements

Proposal ID 9628: MAMA Sensitivity and Focus Monitor

Plan

Purpose Monitor sensitivity of each MAMA grating mode to detect any change due to contamination or other causes. Also monitor the STIS focus in a spectroscopic and an imaging mode.

Description Obtain exposures in each of the 2 low-resolution MAMA spectroscopic modes every 2 months, in each of the 2 medium-resolution modes every 3 months, and in each of the 4 echelle modes every 6 months, using unique calibration standards for each mode, and ratio the results to the first observations to detect any trends. In addition, each monthly L sequence will be preceded by two spectroscopic ACQ/PEAKs with the CCD/G230LB and crossed linear patterns, with the purpose of measuring the focus (PSF across the dispersion as a function of UV wavelength); and each bimonthly M sequence will be preceded by a CCD/F28X50OII direct image also to monitor the focus. Once per year observe the faint white dwarf HS2027+0651 with the PRISM at both 1200 and 2150 central wavelengths, and also observe this star with G140L and G230L to improve the cross calibration.

Fraction GO/GTO Programs Supported 17.1%

Resources Required: Observation 16 external orbits

Resources Required: Analysis 4 FTE weeks for sensitivity
4 FTE weeks for focus

Products Interim reports and ISR on sensitivity monitor. Wavelength-dependent trends for implementation as pipeline corrections. ISR on focus monitors. If the focus quality is found to degrade significantly, a separate program to take corrective action (such as an adjustment of the STIS tip/tilt mirror) may be implemented.

Accuracy Goals Minimum S/N of 50 at the wavelength of least sensitivity for L modes, and at the central wavelengths for M and E modes. 10% for focus changes, i.e FWHM of the profile across the dispersion.

Scheduling& Special Requirements

Proposal ID 9623: MAMA Full-Field Sensitivity Monitor

Plan

Purpose	To monitor the sensitivity of the FUV-MAMA and NUV-MAMA over the full field.
Description	By observing the globular cluster NGC6681 once every year at roughly the same orientation we will monitor the full field sensitivity of the MAMA detectors and also monitor the astrometric and PSF stability. These observations will be used to look for contamination, throughput changes, or formation of color centers in the photocathode and window that might be missed by spectroscopic monitoring or difficult to interpret in flat fielding.
Fraction GO/ GTO Programs Supported	1%
Resources Required: Observation	3 external orbits
Resources Required: Analysis	10 FTE weeks
Products	ISRs, photometric and astrometric accuracy and stability information for GOs and reference files.
Accuracy Goals	1% counting statistics signal-to-noise on bright stars
Scheduling& Special Requirements	

Proposal ID 9615: MAMA Dark Monitor

Plan

Purpose	This test performs the routine monitoring of the MAMA detector dark noise. This proposal will provide the primary means of checking on health of the MAMA detectors systems through frequent monitoring of the background count rate. The purpose is to look for evidence of change in the dark rate, indicative of detector problems developing. Follow-on to proposal 8843.
Description	Two times a week, one 23min exposure is taken with the FUV and NUV MAMAs with the shutter closed. The exposures are taken in ACCUM mode. The length of the exposures is chosen to make them parallels.
Fraction GO/ GTO Programs Supported	17.6%
Resources Required: Observation	226 internal orbits
Resources Required: Analysis	8 FTE weeks
Products	CDBS (_drk) reference files; ISR
Accuracy Goals	Each measurement will give a statistical uncertainty of 1% for the global dark rate.
Scheduling& Special Requirements	Schedule two visits per week for each detector. Adjust schedule to follow completion of 8920.

Proposal ID 9629: MAMA Fold Distribution

Plan

Purpose	The performance of MAMA microchannel plates can be monitored using a MAMA fold analysis procedure. The fold analysis provides a measurement of the distribution of charge cloud sizes incident upon the anode giving some measure of changes in the pulse-height distribution of the MCP and, therefore, MCP gain.
Description	While globally illuminating the detector with a flat field the valid event (VE) rate counter is monitored while various combinations of row and column folds are selected. The procedure is implemented using special commanding and is the same for the FUV and NUV MAMAs with the exception of the gratings/aperture/lamp combinations used for the flat fields. The procedure is described in STIS ISR 98-02.
Fraction GO/GTO Programs Supported	17.6%
Resources Required: Observation	4 internal orbits
Resources Required: Analysis	0.4 FTE weeks
Products	The Engineering Team releases it's Fold Analysis findings bi-annually.
Accuracy Goals	95%
Scheduling& Special Requirements	This proposal should execute in the spring and fall every year.

Proposal ID 9624: MAMA FUV Flats

Plan

Purpose	This program will obtain FUV-MAMA flat-field observations with the Kr lamp for the construction of pixel-to-pixel flats with a S/N of 100 per low-res pixel.
Description	This program will obtain a set of FUV-MAMA flat-field observations with sufficient counts to construct pixel-to-pixel flat fields (P-flats) for all modes. Approximately 10 visits will be required to construct a P-flat with S/N = 100 per low-res pixel. Experience with pre-flight and on-orbit monitoring flats show that the flat-field characteristics are in large measure color- and mode-independent, so that high-quality P-flats constructed with the G140M settings should suffice for all FUV-MAMA spectroscopic and imaging programs. This Cycle-11 calibration program calls for obtaining flats with G140M at 5 SLIT-STEP positions to illuminate regions of the detector normally shadowed by the slit fiducial bars. We will use a cenwave of 1470 Ang and the 52X0.1 slit, which will boost the signal-to-noise to the levels seen in earlier FUV Flat programs. The Cycle 10 FUV Flat program will execute in mid-April 2002, with an expected global count rate of 170,000 cts/sec in the last exposure (through the 52x0.05 aperture at a cenwave of 1387 Ang). Changing the cenwave back to the 1470 Ang setting used in Cycles 7 & 8, along with a slit twice as wide, will boost the signal back up to 230,000 cts/sec.
Fraction GO/GTO Programs Supported	7%
Resources Required: Observation	10 internal orbits
Resources Required: Analysis	4 FTE weeks
Products	reference file (P-flat), ISR
Accuracy Goals	1.0% (0.5% if combined with all previous P-flats). Accuracy is per low-res pixel (2x2 high-res pixels)
Scheduling& Special Requirements	Scheduling: Best if observations occur in the Spring of 2003, to put sufficient time between the Cycle 10 and Cycle 11 flats. Visits should be scheduled such that at least 6 hours elapse between the end of one visit and the beginning of the next, in order to let the lamps cool sufficiently.

Proposal ID 9625: MAMA NUV Flats

Plan

Purpose	This program will obtain NUV-MAMA flat-field observations with the D2 lamp for the construction of pixel-to-pixel flats with a S/N of 100 per low-res pixel.
Description	This program will obtain a set of NUV-MAMA flat-field observations with sufficient counts to construct pixel-to-pixel flat fields (P-flats) for all modes. Approximately 10 visits will be required to construct a P-flat with S/N = 100 per low-res pixel. Experience with pre-flight and on-orbit monitoring flats show that the flat-field characteristics are in large measure color- and mode-independent, so that high-quality P-flats constructed with the G230M settings should suffice for all NUV-MAMA spectroscopic and imaging programs. This Cycle-10 calibration program calls for obtaining flats with G230M at 5 SLIT-STEP positions to illuminate regions of the detector normally shadowed by the slit fiducial bars. We will use a cenwave of 2338 Ang and the 52X0.5 slit, which will boost the signal-to-noise to the levels seen in earlier NUV Flat programs. The Cycle 10 NUV Flat program will execute in mid-April 2002, with an expected global count rate of 170,000 cts/sec in the last exposure (through the 52x0.2 aperture at a cenwave of 2579 Ang). Changing the cenwave back to the 2338 Ang setting used in Cycles 7 & 8, along with a slit 2.5x as wide, will boost the signal back up to 280,000 cts/sec.
Fraction GO/GTO Programs Supported	11%
Resources Required: Observation	10 internal orbits
Resources Required: Analysis	4 FTE weeks
Products	reference file (P-flat), ISR
Accuracy Goals	1.0% (0.5% if combined with all previous P-flats). Accuracy is per low-res pixel (2x2 high-res pixels)
Scheduling& Special Requirements	Best if observations occur in the Spring of 2003, to put sufficient time between the Cycle 10 and Cycle 11 flats. Visits should be scheduled such that at least 6 hours elapse between the end of one visit and the beginning of the next, in order to let the lamps cool sufficiently.

Proposal ID 9630: MAMA FUV/NUV Anomalous Recovery

Plan

Purpose	This proposal is designed to permit recovery of the FUV and NUV MAMA detectors after an anomalous shutdown.
Description	Anomalous shutdowns can occur as a result of bright object violations which trigger the Bright Scene Detection or Software Global Monitors. Anomalous shutdowns can also occur as a result of MAMA hardware problems. The anomalous procedure consists of three procedures, a signal processing electronics check, high voltage ramp-up to an intermediate voltage and high voltage ramp-up to the full operating voltage. During each of the two high voltage ramp-ups, diagnostics are performed during dark and flat field ACCUMs.
Fraction GO/GTO Programs Supported	17.7%
Resources Required: Observation	N/A
Resources Required: Analysis	0.6 FTE weeks
Products	N/A
Accuracy Goals	N/A
Scheduling& Special Requirements	As needed

Proposal ID 9616: E1 Pseudo-Aperture Sensitivity and Throughputs

Plan

Purpose	Check the sensitivity and the aperture throughputs for STIS CCD data taken at the E1 CTE aperture locations.
Description	The E1 pseudo-aperture locations were implemented to allow spectra to be taken easily near row 900. By moving a spectrum closer to the read-out, the number of parallel charge transfers is reduced by about a factor of four, with a comparable reduction expected in the losses due to charge transfer inefficiency during the readout. There is, however, some evidence that the detector sensitivity and focus near row 900 differ by several percent from that near the middle of the detector. This results in errors in the extracted fluxes that may differ from aperture-to-aperture. While some limited data is already available, in order to improve the absolute accuracy of the calibration, additional observations of one of the hot white dwarf standards would be extremely useful, both to verify the other results, and to check the stability of the PSF and aperture throughputs near row 900. We will therefore observe BD+75D325 with the G230LB, G430L, and G750L through a variety of supported slits.
Fraction GO/GTO Programs Supported	2.3%
Resources Required: Observation	4 external orbits
Resources Required: Analysis	2 FTE weeks
Products	reference file updates, ISR
Accuracy Goals	2% Observed count rates will be compared with the standard spectrum for this star, and used to calibrate appropriate throughput and sensitivity curves.
Scheduling& Special Requirements	Before Jan 1, 2003 to facilitate calibration of existing data.

Proposal ID 9610: Spectroscopic PSF

Plan

Purpose	Step two commonly used long slits (52x0.1 and 52x0.2) across a star, moving the star out of the slit to sample the PSF. Make spectroscopic images using G750L to cover a broad wavelength range. For chosen wavelength intervals, the relative fluxes in each slit position and spectral row can be compared to the values predicted using TinyTim models. It is important to verify these models since they are used as input in the dynamical modelling of spectral images; e.g., in the dynamical modelling of galactic nuclei.
Description	Step the 52x0.1 slit across the star in a 5-step pattern centered on the star, with step-size equal to the slit width. Repeat this with the 52x0.1E1 aperture (the same aperture with the star positioned much closer to the readout amplifier to minimize CTE losses). Also do this for the 52x0.2 and 52x0.2E1 apertures, using 3 steps.
Fraction GO/GTO Programs Supported	1%
Resources Required: Observation	3 external orbits
Resources Required: Analysis	1 FTE week
Products	ISR
Accuracy Goals	The target is a K2 star which has good S/N across the passband. For peak counts = 25000 per pixel, a dynamical range of 1000 can be achieved in a single column of a single spectral image. Two dithered images will be combined, and a half-pixel dither from those positions will give another combined image. Since the PSF is undersampled in the spatial direction, it is useful to have these complementary spectral images to provide constraints on the modelled PSF. The spectral trace of G750L is nearly flat over most of the detector, so (undersampled) rectification can be avoided and columns can be summed across to improve the S/N.
Scheduling& Special Requirements	

Proposal ID 9611: CCD Side-2 Gain Ratio Check

Plan

Purpose	Measure the ratio of gain 4 to gain 1 for default amplifier D; measure gain 1 and 4 on amplifier B relative to amplifier D.
Description	Observe a bright spectrophotometric standard star with a wide slit (52x2) with the 3 low dispersion gratings at gain 1 and gain 4, so that the ratio of gain 4 to gain 1 can be measured. (This will be used to calibrate gain 4 relative to gain 1, which is already well measured.) Place the target at the center of the detector and at a row close to the amplifier, and also take some short exposures, so that CTE effects can be measured. Read out some additional exposures through non-default amplifier B, which is used for some calibration programs, so that the gains relative to amp D can be measured. This program will provide an independent measurement of the gain ratio which is better than the technique of dispersion-vs.-intensity for flatfields which has been used previously.
Fraction GO/GTO Programs Supported	11%
Resources Required: Observation	2 external orbits 2 internal orbits
Resources Required: Analysis	1 FTE week
Products	updated gain 4 for amp D and gain 1 and 4 for amp B in the CCD table reference file; possibly an ISR.
Accuracy Goals	> 0.5%; Statistical error in G4/G1 is extremely small (1% per pixel in the brightest pixels). CTE loss cancels out for the target observed at the same distance from the amplifier for the same exposure time. Nominal drift of the target in the wide slit produces negligible errors.
Scheduling& Special Requirements	

Proposal ID 9631: Faint Standards Extension (FASTEX)

Plan

Purpose	The bright primary Sloan survey star will provide the absolute flux zero points in the important Sloan filters for ACS and for the ground-based Sloan program. Fainter standard stars are needed for the flux calibration of COS, for the prism modes on ACS, and for astronomical community, in general.
Description	STIS spectra with G140L, G230L, and G430L are required to improve the two faintest original FASTEX stars and to establish two new standard stars with UV fluxes that are no brighter than WD1657+343. The new standards are LDS749B, an original HST standard with IUE data and a flatter spectrum that provides more IR flux for Nicmos and NGST calibrations, and WD1026+453, a pure hydrogen white dwarf with low reddening. The 9th mag BD+17D4708 will be observed in the three CCD modes at both CCD aperture positions. For the four faint stars, overheads including guide star and target acquisition account for about 15 min in the first orbit and only 5 min in the second, leaving about 35 and 45 min of exposure time in the first and second orbit, respectively. One MAMA obs will be in the first orbit, while the CCD and 2nd MAMA obs follow in the second orbit in that order, so that any problem at the end of the second orbit would only cut the MAMA obs short. The short wl OII filter is used for targ/acq just in case there is an unresolved red star in the acq field. The short CCD obs is included with the MAMA obs, in order to have the complete data set at the same time on the same acq and to stay within the orbit time allocation. Multiple visits per star are required for establishing the repeatability of the flux level. The repeat of each visit should be delayed by one month, since that is the time scale for measurable changes in the CCD flat field. The delay must also be long enough to avoid thermal correlations that often make repeatability better on the few orbit time scales.
Fraction GO/GTO Programs Supported	
Resources Required: Observation	19 external orbits
Resources Required: Analysis	
Products	Two improved and three new STIS spectrophotometric standards and a refereed publication.
Accuracy Goals	1-2% photometry
Scheduling& Special Requirements	Separate visits to the same star by at least 4 weeks

Proposal ID 9619: Echelle Blaze Shift vs. MSM Monthly Offset

Plan

Purpose The data from this program will be used to improve empirical and optical models relating wavelength and blaze function shifts. These models will in turn be used to improve the calibration of echelle data obtained while monthly MSM offsets were enabled.

Description The flux standard G191B2B will be observed with the E230M echelle grating at a central wavelength of 2707 Angstroms. Five exposures will be obtained in a single orbit, each with a different monthly offset applied to the Mode Select Mechanism (MSM). The selected months (Aug, Oct, Dec, Apr, and Jul) scan through the full range of offsets in the echelle dispersion direction. Hence, the observations will also scan through the full range of echelle blaze function shifts. The expected wavelength shifts range from [dX,dY] = [-18,+10] to [+21,13] pixels.

Fraction GO/GTO Programs Supported All archival STIS echelle observations to date.

Resources Required: Observation 1 external orbit

Resources Required: Analysis 3 FTE weeks

Products CALSTIS blaze shift algorithm modifications; ISR

Accuracy Goals Contemporaneous wavecals will yield wavelength shifts with a nominal accuracy better than 1 pixel. Derived sensitivity curves will have an accuracy of 0.1%, allowing blaze shift determinations with a precision better than 1 pixel.

Scheduling& Special Requirements This program should require less commanding effort, if it is executed BEFORE commanding disables MSM monthly offsets, which is a pending request from the Spectrographs group. The program cannot be executed before Aug 2002, however, due to target visibility.