XMM Optical Monitor

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Test Report for XMM-OM Software release 11

DOCUMENT: XMM-OM/MSSL/SP/0233.01 August 19, 2000

CHANGE RECORD

Issue	**Date**	**Changes**
1	20-Aug-2000	First version

Contents

1 Introduction

This is the Test Report for release 11 of the ^{XMM}OM software. It describes the tests performed to check the functionality of the on-board software and the remaining tests to check the fixes for NCR and ECR software changes.

2 Reference Documents

- **XMM-OM/MSSL/ML/0006** ^{XMM}OM VxWorks Command Summary (FM Model) (http://xmmom.mssl.ucl.ac.uk/docs/xmm-om/mssl/ml/0006/)

- **XMM-OM/MSSL/ML/0009** ^{XMM}OM User Manual (FM) - Part 2: Experiment Operations Procedures http://xmmom.mssl.ucl.ac.uk/docs/xmm-om/mssl/ml/0009/ops.ps.gz

- **XMM-OM/MSSL/SP/0207** OM FM Software Testing at MSSL (http://xmmom.mssl.ucl.ac.uk/docs/xmm-om/mssl/sp/0207/icu_fm_testing.ps.gz)

3 Overview

This document describes the software testing done to check the ^{XMM}OM flight code and to check the NCR and ECR fixes.

The general testing philosophy and test equipment is described in the "OM FM Software Testing at MSSL" document XMM-OM/MSSL/SP/0207 (http://xmmom.mssl.ucl.ac.uk/docs/xmm-om/mssl/sp/0207/).

Because of the statistical nature of possible timing problems in real-time, it is not enough to run a particular exposure. To have good confidence that such exposures would run for a whole orbit, they must be tested for a total time which is considerably longer than one orbit.

The tests were carried out over 2 weeks.

4 Abbreviations

CPU	Central Processor Unit
CVS	Concurrent Version System
DEM	Digital Electronics Module (consists of the DPU and the ICU)
DPU	Digital Processing Unit (supplied by the USA team)
ECR	Engineering Change Request
EOB	Electro-Optical Breadboard
ESA	European Space Agency
FAQ	Field Acquisition
GS	guide star(s)
HK	Housekeeping
HV	High Voltage
ICU	Instrument Control Unit (supplied by MSSL)
IFT	Integrated Functional Test
KAL	Keep Alive
LANL	Los Alamos National Laboratory
LUT	Lookup Table
MCP	Microchannel Plate(s)
MSSL	Mullard Space Science Lab (University College London)
NCR	Non-Conformance Report
OM	Optical Monitor
RBI	Remote Bus Interface
SNLA	Sandia National Laboratory
SOC	Science Operations Centre
TMPSU	Telescope module power supply unit
UCSB	University of California at Santa Barbara
XMM	X-ray Multi Mirror Mission
s/c	spacecraft
tc	Telecommand
tm	Telemetry

5 Typographical and Other Conventions Used in this Document

5.1 Typographical

- Running text appears in this normal Roman font.
- *Italic font* will indicate something (*e.g.*, a parameter) that should not be taken literally.
- A `"typewriter" font` will be used to indicate Unix/VxWorks commands.

6 Equipment

All tests at MSSL were performed on the Flight Spare DEM. All tests at SNLA were performed on EOB2.

The MSSL configuration for the tests is the Electronic Ground Support Equipment (EGSE) connected to the flight spare DEM hardware system. The hardware configuration includes a Sun networked via ethernet to a dedicated Force VME processor card running VxWorks housed in a VME bus card cage. Also in this card cage are cards to simulate the spacecraft. The flight spare DEM is thought to behave almost identically to the flight units.

The SNLA configuration is similar but has EOB2 instead of the flight spare DEM. EOB2 has different timing characteristics to the flight units.

The input data is produced either by a QM detector or a fast PC OM1-simulator.

7 Synchronize software

Version control is maintained using the CVS software.

MSSL updates SNLA/LANL with the latest MSSL CVS modules of (the egse) "scripts", the "egse" (code) & ICU uploadable flight "oper" code. UCSB/SNLA/LANL updates MSSL with the latest UCSB CVS modules of the DPU uploadable flight code "white", "blue", "red", "include", "dpu/util".

8 Tests Performed

The tests are performed with both the fast PC OM1-simulator and the QM detector. Each of these test platforms has their own strengths and weaknesses. All science mode tests included fast mode windows to check fast mode operation.

8.1 Tests with fast PC OM1-simulator

Long soak tests were performed with the PC OM1-simulator. The use of the PC OM1-simulator allows realistic scripts to be run with changing window configurations and changing filters, together with a realistic drift to test the "Accumulate and Track" mode. The simulator does, however, generate gaps in the event streams since it is not possible to generate photons in real time at a sufficient rate. Typical gaps in the photon stream range between 10 and 40 ms).

The input data to the PC simulator is APM (Automatic Plate Measuring) data from the Digitised Sky Survey which allows the input of stars and galaxies (parameterised by an elliptical function) down to approximately 21st magnitude. Estimates of the stars' spectral type were made from the APM colours (E and O) with extended sources having a galaxy spectrum. In running the tests a number of different star fields were used including a cluster field with a large number of extended sources. The exact list of fields used for these tests are given in table 1. The current simulator tests do not include any strong background features as seen with the inflight detector, but these have not caused any problems with the current on-board software.

Tests using the simulator were performed both at MSSL and at SNLA.

8.2 Tests with QM detector

Test have also been run with the QM detector at MSSL together with a light source with a star mask. The use of the QM detector allows tests to be performed with the real hardware. Procedures such as the high voltage turn on and off were also tested. The QM has the further advantage that is uses real photon data so there are no gaps in the photon event stream, which is particularly useful for testing fast mode data.

9 Summary of the tests

9.1 Engineering Modes

The following modes were tested:

9.1.1 Engineering mode 6

Tested using the QM detector using script `eng6`.

9.1.2 Engineering mode 3

Tested using the QM detector using script `eng3`.

9.1.3 Engineering mode 4

Tested using the QM detector using script `eng4`.

9.1.4 Engineering mode 5

Tested using the QM detector using script `eng5`.

Field Name	Total Exposure time (hr)
QM	24
3C273	48
EG And	24
G158-100	48
GD 153	48
Her 1720+50	24
TOTAL	216

Table 1: List of fields, number of exposures and exposure time for the tests

9.2 Science Exposures

Science exposures were performed with the PC OM1-simulator testing "Choose Guide Stars" and "Accumulate and track"."Choose Guide Stars" and "Accumulate and track" were tested also with the QM detector.

9.2.1 Whole CCD hijacked-eng2

The new whole CCD exposure was tested using the QM detector using script `whole` and in the soak testing on the simulator using the generated scripts.

10 Results of tests

10.1 Science capability with release 11

The science (with and without fast mode windows) and wholeCCD exposures work without the errors seen before and can be mixed better with the capability of interleaving wholeCCD exposures and exposures with odd numbers of frames.

10.1.1 Engineering modes

The engineering modes worked perfectly as before. Engineering mode 4 now outputs 16-chunks again instead of the 1-chunk that has been used for some months.

10.1.2 Image modes

O.K. But NCRs still open on guide star selection and fast mode. These open NCRs should not stop these observations being performed.

10.1.3 Fast mode

O.K.

10.2 New anomalies

A few a595 and an a580 alert may be seen during the choose guide stars part of certain exposures. This is now understood to some extent and NCR 210 will be opened soon. This problem should have no detrimental effect.

11 Test Reports

11.1 Test report for ECR 87

The only change to the ICU code was the final part of ECR 87.

Purpose of tests

This was an ECR to change critical "exceptions" to "major anomalies".

Test Location

MSSL

Test environments

QM Optics and BPE
FS DEM

Expected results

Should see an SSI major anomaly.

Tests performed

Got the DPU to generate a stream of alerts to overflow the SSI input buffer.

Results

The expected SSI major anomaly was seen (rather than the exception as was seen in earlier releases).

Code changes

icu/fm/oper/ssi_in.adb version 1.13

Performed by: pjs1 at MSSL.

12 Appendix A: VxWorks Scripts

Here are the VxWorks scripts used for software testing in the UK. Frequently used procedures have scripts. Other procedures are followed from ML/0009.

12.1 acquire

```
##############################################################################
#
# RCS $Id: acquire,v 1.5 1999/03/21 17:37:26 pjs1 Exp $
# RCS $Log: acquire,v $
# RCS Revision 1.5  1999/03/21 17:37:26  pjs1
# RCS Don't set exp_no and don't copy ref_stars.cfg file.
# RCS
# RCS Revision 1.4  1999/03/18 20:46:28  pjs1
# RCS Set threshold to 15.  Increased end delay.
# RCS
# RCS Revision 1.3  1999/03/15 15:26:41  pjs1
# RCS Decreased Jon delay (for simulator use only).
# RCS
# RCS Revision 1.2  1999/03/04 04:44:03  pjs1
# RCS Added load_tables.
# RCS
# RCS Revision 1.1  1999/03/04 02:28:45  pjs1
# RCS The scripts after the Feb 1999 USA integration.
# RCS
#
##############################################################################


##################################################################
#
#   Set up some numbers first
#
##################################################################

date
frame_time = 15
bpe_bin = 0
filter = 1
#exp_no = 0xd40001
#copy "/home/xmmom/sim_data/ref_stars.cfg","ref_stars.cfg"

#############################################
```

```
tc_det_acq_mode 0

# load det acq 0 configuration
< load_table_24
# Jon delay
taskDelay(10*60)

tc_fw_filter 1
tc_fw_move
taskDelay(20*60)

tc_set_bpe bpe_bin
tc_set_exp_no exp_no

tc_det_enbl_frame_tag 1
tc_det_event_threshold 15

# load reference stars
< load_table_25

# ref frame exp
tc_set_frame_time frame_time*1024

tc_send_command IC_INIT_EXP
taskDelay(3*60)

# change to science mode
#tc_mode 3
# start the detector integration
tc_det_start_int

tc_send_command IC_ACQUIRE_FLD
taskDelay(frame_time*60)
tc_det_stop_int
# should check this
taskDelay(60*60)
```

12.2 cgs

```
##############################################################################
#
# RCS $Id: cgs,v 1.4 1999/04/13 16:21:16 pjs1 Exp $
# RCS $Log: cgs,v $
# RCS Revision 1.4  1999/04/13 16:21:16  pjs1
# RCS Removed Jon delay.
# RCS
# RCS Revision 1.3  1999/03/18 20:46:50  pjs1
# RCS Added enable frame tags and threshold.
# RCS
# RCS Revision 1.2  1999/03/04 04:44:03  pjs1
# RCS Added load_tables.
# RCS
# RCS Revision 1.1  1999/03/04 02:28:46  pjs1
# RCS The scripts after the Feb 1999 USA integration.
# RCS
#
##############################################################################

date
tc_fw_filter filter
tc_fw_move
taskDelay(20*60)
tc_det_acq_mode 0

# load acq 0 mode
< load_table_24
# Jon delay
taskDelay(20*60)

tc_set_exp_no exp_no
tc_send_command IC_INIT_EXP
taskDelay(3*60)

tc_det_enbl_frame_tag 1
tc_det_event_threshold 15

############
tc_set_frame_time frame_time*1024
# tc_prog_mem_wind "mmw.cfg"
< load_table_28
# tc_prog_sci_wind "scw.cfg"
< load_table_29
```

```
tc_set_exposure_time exposure_time
tc_set_bpe bpe_bin
tc_det_start_int
tc_send_command IC_CHOOSE_GS
taskDelay((frame_time+40+40)*60)
tc_det_stop_int
# Jon delay
#taskDelay(60*60)
```

12.3 exp

```
###############################################################################
#
# RCS $Id: exp,v 1.3 1999/04/13 16:21:31 pjs1 Exp $
# RCS $Log: exp,v $
# RCS Revision 1.3  1999/04/13 16:21:31  pjs1
# RCS Added tracking on.
# RCS
# RCS Revision 1.2  1999/03/18 20:47:05  pjs1
# RCS Changed threshold.
# RCS
# RCS Revision 1.1  1999/03/04 02:28:47  pjs1
# RCS The scripts after the Feb 1999 USA integration.
# RCS
#
###############################################################################

date
tc_det_acq_mode 2
tc_set_bpe bpe_bin
#
# Put BPE into the right mode, really shouldn't be here
#
tc_det_enbl_frame_tag 1
tc_det_event_threshold 15
#
tc_det_start_int
# taskDelay 2*60
tc_send_command IC_TRACK_GS
taskDelay((frame_time*(exposure_time+1)+10)*60)
tc_set_trk 1

```

12.4 eng3

```
###############################################################################
#
# RCS $Id: eng3,v 1.9 2000/08/09 09:32:57 pjs1 Exp $
# RCS $Log: eng3,v $
# RCS Revision 1.9  2000/08/09 09:32:57  pjs1
# RCS Increased Dave delay to 45s.
# RCS
# RCS Revision 1.8  1999/04/13 16:14:52  pjs1
# RCS Changed detector windows.
# RCS
# RCS Revision 1.7  1999/03/21 17:38:48  pjs1
# RCS Changed archive name.  Changed exposure id.  Changed window size.  Added missing delay at end.
# RCS
# RCS Revision 1.6  1999/03/20 20:39:55  pjs1
# RCS Added open packet_archive. Moved LEDs. Changed exposure id.  Removed enable_verbose. Changed threshold.  Added a Dave.
# RCS
# RCS Revision 1.5  1999/03/17 21:19:54  pjs1
# RCS Added date, increased frame_time, added leds, added blocked, turned off frame
# RCS tags, increased delay, added Dave.
# RCS
# RCS Revision 1.4  1999/03/16 19:45:24  pjs1
# RCS Changed exposure ID, window coords, delays.
# RCS
# RCS Revision 1.3  1999/03/16 08:43:29  pjs1
# RCS Changed exposure id, acquisition mode, delay.
# RCS
# RCS Revision 1.2  1999/03/15 15:25:42  pjs1
# RCS Increased delay at end.
# RCS
# RCS Revision 1.1  1999/03/15 15:24:53  pjs1
# RCS New engineering mode scripts.
# RCS
#
###############################################################################
date
open_packet_archive("/data/xmmom/archive/d40003")
frame_time=300
tc_mode 4

tc_init_dpu
taskDelay(60*45)
# expect Dave from the Grave

```

```
tc_fw_filter 0
tc_fw_move
taskDelay(20*60)
tc_det_flood_led_current 4
tc_set_frame_time frame_time*1024
tc_set_exp_no 0xd40003
tc_send_command IC_INIT_EXP
# tm_wait_for_alert DA_EOT_INIT_EXP
taskDelay(3*60)

det_reset_wind
# full size
#det_wind 64, 15, 256, 256
#inner part
det_wind 64+32, 15+32, 256-64, 256-64
tc_det_load_windows 1
taskDelay(60*60)

#turn on eng7 if necessary - probably not for post perigee procedure
#tc_enbl_verbose 4,1
tc_det_enbl_frame_tag 0
tc_det_event_threshold 15

tc_det_acq_mode 4

# start sending events from mic
tc_det_start_int

tc_enbl_eng 1, 3

# wait for DA_ENDOF_EXP DA_COMPLETE_EXP all data
taskDelay(frame_time*60)
# the following delay is for 4,1
#taskDelay(500*60)
taskDelay(380*60)

close_packet_archive
tc_det_flood_led_current 0

tc_mode 2
```

12.5 eng4

```
################################################################################
#
# RCS $Id: eng4,v 1.8 2000/08/09 09:32:57 pjs1 Exp $
# RCS $Log: eng4,v $
# RCS Revision 1.8  2000/08/09 09:32:57  pjs1
# RCS Increased Dave delay to 45s.
# RCS
# RCS Revision 1.7  1999/07/08 10:54:46  pjs1
# RCS Changed delay.
# RCS
# RCS Revision 1.6  1999/03/21 17:39:12  pjs1
# RCS Changed archive name and exposure id.
# RCS
# RCS Revision 1.5  1999/03/20 20:43:47  pjs1
# RCS Changed frame_time. Added open_packet_archive. Added Dave.
# RCS
# RCS Revision 1.4  1999/03/17 21:20:45  pjs1
# RCS Added date, fixed delay, turned off frame tags.
# RCS
# RCS Revision 1.3  1999/03/16 19:50:37  pjs1
# RCS Changed threshold.
# RCS
# RCS Revision 1.2  1999/03/16 08:43:48  pjs1
# RCS Added mode change to idle.
# RCS
# RCS Revision 1.1  1999/03/15 16:47:26  pjs1
# RCS Engineering mode 4.
# RCS
#
################################################################################
date
open_packet_archive("/data/xmmom/archive/d40004")
frame_time=300
tc_mode 4

tc_init_dpu
taskDelay(60*45)
# expect Dave from the Grave

tc_set_frame_time frame_time*1024
tc_set_exp_no 0xd40004
tc_send_command IC_INIT_EXP
# tm_wait_for_alert DA_EOT_INIT_EXP
```

```
taskDelay(3*60)

det_reset_wind
det_wind 64, 15, 256, 256
tc_det_load_windows 1
taskDelay(60*60)

# Jon delay
taskDelay(20*60)

tc_det_enbl_frame_tag 0
tc_det_event_threshold 15
tc_det_acq_mode 3

# start sending events from mic
tc_det_start_int

tc_enbl_eng 1, 4

# wait for DA_ENDOF_EXP
taskDelay(frame_time*60)
#tm_wait_for_alert DA_COMPLETE_EXP
taskDelay(4800*60)
# beware: extra delay necessary
taskDelay(300*60)

tc_mode 2
close_packet_archive
```

12.6 eng5

```
################################################################################
#
# RCS $Id: eng5,v 1.7 2000/08/09 09:32:57 pjs1 Exp $
# RCS $Log: eng5,v $
# RCS Revision 1.7  2000/08/09 09:32:57  pjs1
# RCS Increased Dave delay to 45s.
# RCS
# RCS Revision 1.6  1999/04/13 16:14:05  pjs1
# RCS Changed delays and exposure time.
# RCS
# RCS Revision 1.5  1999/03/21 17:39:31  pjs1
# RCS Changed archive name and exposure id.
# RCS
# RCS Revision 1.4  1999/03/20 20:44:52  pjs1
# RCS Lengthened frame_time. Added open_packet_archive. Moved LEDs. Changed threshold. Added Dave.
# RCS
# RCS Revision 1.3  1999/03/17 21:21:59  pjs1
# RCS Added date, increased frame_time, added blocked, disabled tags, added LEDs, added Dave.
# RCS
# RCS Revision 1.2  1999/03/16 19:45:24  pjs1
# RCS Changed exposure ID, window coords, delays.
# RCS
# RCS Revision 1.1  1999/03/15 15:24:53  pjs1
# RCS New engineering mode scripts.
# RCS
#
################################################################################
date
open_packet_archive("/data/xmmom/archive/d40005")
# was 600
frame_time=4000
tc_mode 4

tc_init_dpu
taskDelay(60*45)
# expect Dave from the Grave

tc_fw_filter 0
tc_fw_move
taskDelay(20*60)
tc_det_flood_led_current 4
tc_set_frame_time frame_time*1024
tc_set_exp_no 0xd40005
```

```
tc_send_command IC_INIT_EXP
# tm_wait_for_alert DA_EOT_INIT_EXP
taskDelay(3*60)

det_reset_wind
det_wind 64, 15, 256, 256
tc_det_load_windows 1
taskDelay(60*60)

tc_det_enbl_frame_tag 0
tc_det_event_threshold 15
tc_det_acq_mode 3

# start sending events from mic
tc_det_start_int

tc_enbl_eng 1, 5

# wait for DA_ENDOF_EXP
taskDelay(frame_time*60)
taskDelay(130*60)
#tm_wait_for_alert DA_COMPLETE_EXP
taskDelay(20*60)
# wait for data
taskDelay(20*60)

close_packet_archive

tc_det_flood_led_current 0

tc_mode 2
```

12.7 eng6

```
##############################################################################
#
# RCS $Id: eng6,v 1.7 2000/08/09 09:32:58 pjs1 Exp $
# RCS $Log: eng6,v $
# RCS Revision 1.7  2000/08/09 09:32:58  pjs1
# RCS Increased Dave delay to 45s.
# RCS
# RCS Revision 1.6  1999/04/13 16:15:44  pjs1
# RCS Changed delay.
# RCS
# RCS Revision 1.5  1999/03/21 17:39:31  pjs1
# RCS Changed archive name and exposure id.
# RCS
# RCS Revision 1.4  1999/03/20 20:46:11  pjs1
# RCS Added open_packet_archive. Added Dave.
# RCS
# RCS Revision 1.3  1999/03/17 21:22:34  pjs1
# RCS Added date, added blocked, added LEDs, disabled frame tags, added Dave.
# RCS
# RCS Revision 1.2  1999/03/16 19:45:25  pjs1
# RCS Changed exposure ID, window coords, delays.
# RCS
# RCS Revision 1.1  1999/03/15 15:24:54  pjs1
# RCS New engineering mode scripts.
# RCS
#
##############################################################################
date
open_packet_archive("/data/xmmom/archive/d40006")
frame_time=20
tc_mode 4

tc_init_dpu
taskDelay(60*45)
# expect Dave from the Grave

tc_fw_filter 0
tc_fw_move
taskDelay(20*60)
tc_det_flood_led_current 4

tc_set_frame_time frame_time*1024
tc_set_exp_no 0xd40006
```

```
tc_send_command IC_INIT_EXP
# tm_wait_for_alert DA_EOT_INIT_EXP
taskDelay(3*60)

det_reset_wind
det_wind 64, 15, 256, 256
tc_det_load_windows 1
taskDelay(60*60)

tc_det_enbl_frame_tag 0
tc_det_event_threshold 12
tc_det_acq_mode 6

# start sending events from mic
tc_det_start_int

tc_enbl_eng 1, 6

# wait (exposure time) for DA_ENDOF_EXP
taskDelay(frame_time*60)
#tm_wait_for_alert DA_COMPLETE_EXP
taskDelay(20*60)
# wait for end of data
taskDelay(20*60)

close_packet_archive

tc_det_flood_led_current 0

tc_mode 2
```

12.8 whole

```
#tc_mode 2
#tc_mode 3
#open_packet_archive("/data/xmmom/archive/d40009")
#exp_no = 0xd40009
#exposure_time = 1
#frame_time = 100
#bpe_bin = 1
trk = 0
#copy "/home/xmmom/sim_data/wholeccd.mmw.cfg","mmw.cfg"
#copy "/home/xmmom/sim_data/wholeccd.scw.cfg.30","scw.cfg"
##############################
tc_set_trk 0
##########
# This is the modified cgs. One change:
# 1. taskDelay (frame_time+40+40)*60 -> taskDelay 10*60
#
<cgs.0
##########
# This is the modified exp
# Two changes
# 1. tc_det_acq_mode 2 -> tc_det_acq_mode 0
# 2. taskDelay((frame_time*(exposure_time+1)+10)*60) ->
#    taskDelay((frame_time*(exposure_time)+10)*60)
#
<exp.3
<flush
taskDelay 60*2200

tc_set_bpe 0
tc_init_dpu
taskDelay(60*45)
# expect Dave from the Grave

#close_packet_archive
```

12.9 cgs.0

```
##############################################################################
#
# RCS $Id: cgs,v 1.3 1999/03/18 20:46:50 pjs1 Exp $
# RCS $Log: cgs,v $
# RCS Revision 1.3  1999/03/18 20:46:50  pjs1
# RCS Added enable frame tags and threshold.
# RCS
# RCS Revision 1.2  1999/03/04 04:44:03  pjs1
# RCS Added load_tables.
# RCS
# RCS Revision 1.1  1999/03/04 02:28:46  pjs1
# RCS The scripts after the Feb 1999 USA integration.
# RCS
#
##############################################################################

#date
#
tc_fw_filter filter
tc_fw_move
taskDelay(20*60)
tc_det_acq_mode 0

# load acq 0 mode
< load_table_24
# Jon delay
taskDelay(20*60)

tc_det_enbl_frame_tag 1
tc_det_event_threshold 15

tc_set_exp_no exp_no
tc_send_command IC_INIT_EXP
taskDelay(3*60)

############
tc_set_frame_time frame_time*1024
# tc_prog_mem_wind "mmw.cfg"
< load_table_28
# tc_prog_sci_wind "scw.cfg"
< load_table_29
tc_set_exposure_time exposure_time
tc_set_bpe bpe_bin
```

```
tc_det_start_int
taskDelay 30
tc_send_command IC_CHOOSE_GS
# taskDelay((frame_time+40+40)*60)
taskDelay(10*60)
tc_det_stop_int
# Jon delay
taskDelay(10*60)
```

12.10 exp.3

12.11 flatfield

```
###############################################################################
#
# RCS $Id: flatfield,v 1.6 2000/08/09 09:34:59 pjs1 Exp $
# RCS $Log: flatfield,v $
# RCS Revision 1.6  2000/08/09 09:34:59  pjs1
# RCS Changed to use exp.2 to use acq mode 0 and closes archive at end.
# RCS
# RCS Revision 1.5  1999/09/27 19:43:57  pjs1
# RCS Added turn off tracking before each cgs.
# RCS Removed turn on tracking at end (done by exp now).
# RCS
# RCS Revision 1.4  1999/07/08 10:55:21  pjs1
# RCS Added move filter wheel to blocked.
# RCS
# RCS Revision 1.3  1999/03/20 20:57:38  pjs1
# RCS Added open_packet_archive. Changed exposure IDs. Altered LED. Put all exposures back in.
# RCS
# RCS Revision 1.2  1999/03/17 21:27:30  pjs1
# RCS Added date.
# RCS
# RCS Revision 1.1  1999/03/04 02:28:59  pjs1
# RCS The scripts after the Feb 1999 USA integration.
# RCS
#
###############################################################################

date
open_packet_archive("/data/xmmom/archive/d40018")
#####################
# Common parameters for all 4 FF
#
frame_time = 25
exposure_time = 20
bpe_bin = 1
track = 0
filter = 0
led = 4
copy "/home/xmmom/sim_data/e40018/mmw.cfg","mmw.cfg"
#####################
tc_fw_filter 0
tc_fw_move
taskDelay(20*60)
tc_set_bpe bpe_bin
```

```
tc_mode 2
tc_mode 4
tc_det_flood_led_current led
tc_mode 2
tc_mode 3
######################
# Specific parameters for FF
#
exp_no = 0xd40008
copy "/home/xmmom/sim_data/e40018/scw.cfg","scw.cfg"
######################
# could be <cgs_wo_fw_move to save some time
#
tc_set_trk track
<cgs
<exp.2
######################
# Specific parameters for FF
exp_no = 0xd40009
copy "/home/xmmom/sim_data/e40019/scw.cfg","scw.cfg"
######################
# could be <cgs_wo_fw_move to save some time
#
tc_set_trk track
<cgs
<exp.2
######################
# Specific parameters for FF
exp_no = 0xd4000a
copy "/home/xmmom/sim_data/e4001a/scw.cfg","scw.cfg"
######################
# could be <cgs_wo_fw_move to save some time
#
tc_set_trk track
<cgs
<exp.2
######################
# Specific parameters for FF
exp_no = 0xd4000b
copy "/home/xmmom/sim_data/e4001b/scw.cfg","scw.cfg"
######################
# could be <cgs_wo_fw_move to save some time
#
tc_set_trk track
<cgs
<exp.2
```

```
######################
tc_set_bpe 0
tc_mode 2
tc_mode 4
tc_det_flood_led_current 0
tc_mode 2
tc_mode 3

##########################################################################
##########################################################################
# vvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvv
# remember to flush and close_packet_archive #############################
# ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
##########################################################################
##########################################################################
<flush
taskDelay(535*60)
taskDelay(60*60)
close_packet_archive

```

12.12 exp.2

```
###############################################################################
#
# RCS $Id: exp.2,v 1.3 2000/08/17 14:12:52 pjs1 Exp $
# RCS $Log: exp.2,v $
# RCS Revision 1.3  2000/08/17 14:12:52  pjs1
# RCS Added exp.2 script with acq mode 0 for flatfield.
# RCS
#
###############################################################################
date
tc_det_acq_mode 0
tc_set_bpe bpe_bin
#
# Put BPE into the right mode, really shouldn't be here
#
tc_det_enbl_frame_tag 1
tc_det_event_threshold 15
#
tc_det_start_int
# taskDelay 2*60
tc_send_command IC_TRACK_GS
taskDelay((frame_time*(exposure_time+1)+10)*60)
tc_set_trk 1
```

12.13 reset_icu

```
##############################################################################
#
# RCS $Id: reset_icu,v 1.5 2000/08/09 09:31:54 pjs1 Exp $
# RCS $Log: reset_icu,v $
# RCS Revision 1.5  2000/08/09 09:31:54  pjs1
# RCS Changed tc_fw_filter to tc_fw_abs_steps.
# RCS
# RCS Revision 1.4  1999/03/18 19:17:11  pjs1
# RCS Added missing delay.
# RCS
# RCS Revision 1.3  1999/03/17 21:14:44  pjs1
# RCS Removed tc_mode 1, added date and filter to blocked.
# RCS
# RCS Revision 1.2  1999/03/15 15:28:53  pjs1
# RCS Increased filter wheel wait because position unknown.
# RCS
# RCS Revision 1.1  1999/03/04 02:29:02  pjs1
# RCS The scripts after the Feb 1999 USA integration.
# RCS
#
##############################################################################
date
tc_fw_to_datum
tc_fw_move
taskDelay(25*60)
tc_fw_abs_steps 1200
tc_fw_move
taskDelay(20*60)
tc_enable_sid 0xff
tc_mode 2
```

12.14 tc_clean_slate

```
###############################################################################
#
# RCS $Id: tc_clean_slate,v 1.4 2000/08/09 09:32:57 pjs1 Exp $
# RCS $Log: tc_clean_slate,v $
# RCS Revision 1.4  2000/08/09 09:32:57  pjs1
# RCS Increased Dave delay to 45s.
# RCS
# RCS Revision 1.3  1999/09/27 19:41:29  pjs1
# RCS Added wait for "synchronize the clock".
# RCS
# RCS Revision 1.2  1999/03/17 21:13:23  pjs1
# RCS Added date and removed debug patch.
# RCS
# RCS Revision 1.1  1999/03/04 02:29:02  pjs1
# RCS The scripts after the Feb 1999 USA integration.
# RCS
#
###############################################################################

date
#
#  Reset the ICU to the operational mode
#

rate 8

open_packet_archive "/data/xmmom/archive/d80ini"

set_dump_tm 0

#####################################################
#
# This script brings up the DPU in a clean slate
#
#####################################################

# clear all GSE semaphores

tm_clear_sem

#
#  First reset the DPU
#
```

```
tc_reset_dsp 0
taskDelay (60*12)

#
# Next reload the DPUOS
#
tc_load_dpuos
taskDelay (60*10)

# Turn on all color processors
tc_enbl_dsp red,1
taskDelay (60*10)

tc_enbl_dsp blue1,1
taskDelay (60*10)

tc_enbl_dsp blue2,1
taskDelay (60*10)

# Select blue2 as the klingon
tc_sel_klingon 1

# synchronize the clock bewteen ICU and DPU
tc_synch_clk_auto

#wait for it to happen
taskDelay(60*2)

#################################################################
#
# Initialize DPU
#
#################################################################
tc_init_dpu
taskDelay(60*45)
# expect Dave from the Grave

# DA_TRK enabled by code - not selectable
#tc_report_tracking 1
# DP_TRH enabled already
#tc_enbl_verbose 0,1
# turn on DD_REF verbosity
tc_enbl_verbose 3,1

# remove this later. special patch to debug Linux/Sim
#tc_load_local_ram 0x5c60,0x30
```

```

close_packet_archive
```

12.15 load_icu

```
################################################################################
#
# RCS $Id: load_icu,v 1.2 1999/07/08 10:56:36 pjs1 Exp $
# RCS $Log: load_icu,v $
# RCS Revision 1.2  1999/07/08 10:56:36  pjs1
# RCS Commented out set_dump_tc and set_dump_tm.
# RCS
# RCS Revision 1.1  1999/03/04 02:29:00  pjs1
# RCS The scripts after the Feb 1999 USA integration.
# RCS
#
################################################################################
rate 100
set_dump_tc 0
set_dump_tm 0
packet_load < /home/pjs1/icu/fm/oper/icu.hex
#set_dump_tc 1
#set_dump_tm 1
rate 8
```

12.16 load_dpu

```
#############################################################################
#
# RCS $Id: load_dpu,v 1.3 1999/07/08 10:57:03 pjs1 Exp $
# RCS $Log: load_dpu,v $
# RCS Revision 1.3  1999/07/08 10:57:03  pjs1
# RCS Commented out set_dump_tc and set_dump_tm.
# RCS
# RCS Revision 1.2  1999/03/20 20:58:12  pjs1
# RCS Removed unnecessary delay. Removed set_dump_tm.
# RCS
# RCS Revision 1.1  1999/03/04 02:28:59  pjs1
# RCS The scripts after the Feb 1999 USA integration.
# RCS
#
#############################################################################
rate 100
set_dump_tc 0
set_dump_tm 0
tc_reset_dsp
taskDelay(60*10)
tc_packet_load 0 < /home/xmmom/dpu/development/eeprom/p0.cmd.0
tc_packet_load 5 < /home/xmmom/dpu/development/eeprom/p5.cmd.0
tc_packet_load 7 < /home/xmmom/dpu/development/eeprom/p7.cmd.0
tc_packet_load 3 < /home/xmmom/dpu/development/eeprom/blue_p3.cmd.0
#set_dump_tc 0
#set_dump_tm 0
#taskDelay(60*12)
tc_load_dpuos
taskDelay(60*6)
rate 8
```

12.17 load_table_24

```
################################################################################
#
# RCS $Id: load_table_24,v 1.1 1999/03/04 04:44:04 pjs1 Exp $
# RCS $Log: load_table_24,v $
# RCS Revision 1.1  1999/03/04 04:44:04  pjs1
# RCS Added load_tables.
# RCS
#
################################################################################
det_reset_wind
det_wind 64,15,128,128
det_wind 64,143,128,128
det_wind 192,15,128,128
det_wind 192,143,128,128
tc_det_load_windows 4
taskDelay(30*60)
```

12.18 load_table_25

```
##############################################################################
#
# RCS $Id: load_table_25,v 1.1 1999/03/04 04:44:04 pjs1 Exp $
# RCS $Log: load_table_25,v $
# RCS Revision 1.1  1999/03/04 04:44:04  pjs1
# RCS Added load_tables.
# RCS
#
##############################################################################
tc_prog_ref_stars "ref_stars.cfg"
```

12.19 load_table_28

```
################################################################################
#
# RCS $Id: load_table_25,v 1.1 1999/03/04 04:44:04 pjs1 Exp $
# RCS $Log: load_table_25,v $
# RCS Revision 1.1  1999/03/04 04:44:04  pjs1
# RCS Added load_tables.
# RCS
#
################################################################################
tc_prog_ref_stars "ref_stars.cfg"
```

12.20 load_table_29

```
##############################################################################
#
# RCS $Id: load_table_29,v 1.1 1999/03/04 04:44:05 pjs1 Exp $
# RCS $Log: load_table_29,v $
# RCS Revision 1.1  1999/03/04 04:44:05  pjs1
# RCS Added load_tables.
# RCS
#
##############################################################################
tc_prog_sci_wind "scw.cfg"
```

12.21 hvonqm

```
##############################################################################
#
# RCS
#
##############################################################################

date

waw 0x3fe,1

tc_det_load_hv_ramp_params 3,100,25,0
tc_det_start_hv_ramp
taskDelay(10 * 60)

tc_det_load_hv_ramp_params 3,1400,25,0
tc_det_start_hv_ramp
taskDelay(90 * 60)

tc_det_load_hv_ramp_params 2,500,25,0
tc_det_start_hv_ramp
taskDelay(40 * 60)

# don't need
#tc_det_load_hv_ramp_params 1,2,25,0
#tc_det_start_hv_ramp
#taskDelay(8 * 60)

tc_det_load_hv_ramp_params 1,390,25,0
tc_det_start_hv_ramp
taskDelay(30 * 60)

tc_det_load_hv_ramp_params 3,1830,25,0
tc_det_start_hv_ramp
taskDelay(30 * 60)

tc_det_load_hv_ramp_params 2,650,25,0
tc_det_start_hv_ramp
taskDelay(10 * 60)

waw 0x3fe,0
```

12.22 hvoffqm

```
date

waw 0x3fe,1

tc_det_load_hv_ramp_params 1,0,25,0
tc_det_start_hv_ramp
taskDelay(30*60)

tc_det_load_hv_ramp_params 2,0,25,0
tc_det_start_hv_ramp
taskDelay(40*60)

tc_det_load_hv_ramp_params 3,0,25,0
tc_det_start_hv_ramp
taskDelay(100*60)

waw 0x3fe,0
```

12.23 flush

```
################################################################################
#
# RCS $Id: flush,v 1.2 1999/03/10 22:13:19 mcrw Exp $
# RCS $Log: flush,v $
# RCS Revision 1.2  1999/03/10 22:13:19  mcrw
# RCS Added date.
# RCS
# RCS Revision 1.1  1999/03/04 02:28:59  pjs1
# RCS The scripts after the Feb 1999 USA integration.
# RCS
#
################################################################################
date
tc_send_command IC_FLUSH_CMPRS
```

12.24 reset

```
###############################################################################
#
# RCS $Id: reset,v 1.2 1999/03/17 21:27:31 pjs1 Exp $
# RCS $Log: reset,v $
# RCS Revision 1.2  1999/03/17 21:27:31  pjs1
# RCS Added date.
# RCS
# RCS Revision 1.1  1999/03/04 02:29:02  pjs1
# RCS The scripts after the Feb 1999 USA integration.
# RCS
#
###############################################################################
date
reset
packet_msg 0
taskDelay(20*60)
packet_msg 1
```