Detailed functional tests for DAS/CCD3 software
FITS header (WCS, by external FITS information module)

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13/11 – 2009, Comments by AiC.

Test number	**4**
Test name	**FITS header (WCS, by external FITS information module)**
Test document	**04-test-FITS-HDR-WCS**
Depends on test	7, Transmission of CCD3 events (over Ivy bus) (for triggering)
Require-ments	The FITS keyword records associated with the World Coordinate System (WCS) shall be present in the image file in the extensions containing the image data they are describing. The values of the WCS keywords shall be identical to the values produced by the “NOT2MEF” programme currently used at the NOT, for the same telescope pointings, image rotation and detector geometry (size, binning).
Circum-stances	– The complete CCD3/DAS system shall be running, connected to a detector controller, controlling a CCD or reading out a dummy test pattern. – There shall be a network connection available for the external FITS information module to access the NOT “Operations” database.
Test descrip-tions	Subtests 4.1 (ALFOSC/FASU): Subtest 4.1.1 (correct values for WCS keywords): – The following 12 images shall be available for comparison of the correct values: 1) with amplifier A, 1x1 binning, full frame. 2) with amplifier AB, 1x1 binning, full frame. 3) with amplifier A, 1x2 binning, full frame. 4) with amplifier AB, 1x2 binning, full frame 5) with amplifier A, 2x2 binning, full frame. 6) with amplifier AB, 2x2 binning, full frame. 7) with amplifier A, 1x3 binning, full frame. 8) with amplifiers AB, 1x3 binning, full frame. 9) with amplifier A, 3x3 binning, full frame 10) with amplifiers AB, 3x3 binning, full frame. 11) As for 1-10 but with the readout window having the size 300x500 pixels and starting on x=301 and y=501 (first pixel).

These images shall be obtained with ALFOSC at the NOT.

- An Ivy terminal used for sending the control message (see ref.7 of the ODF-TEST document) shall be opened.
- An Ivy control message with its parameters set identical to each of the exposures described above shall be sent in the Ivy terminal.
- Before sending these Ivy control messages, the RA, DEC and FIELD values used as input to the external FITS information module shall be set identical to the RA, DEC and FIELD value in each of the exposures described above.

Subtest 4.1.2 (request for and writing of headers for ALFOSC/FASU/TCS):

- The external FITS information module shall be started for the ALFOSC/FASU/TCS system.
- A normal exposure (i.e. with the shutter open) of 5 seconds shall be made, using the command “exp 5”.

Subtests 4.2 (FIES):

Subtest 4.2.1 (correct values for WCS keywords):
As for subtest 4.1.1, but the images shall be obtained with FIES.

Subtest 4.2.2 (request for and writing of headers for FIES/TCS):
As for subtest 4.1.2, but the system shall be FIES/TCS.

Subtests 4.3 (STANCAM):

Subtest 4.3.1 (correct values for WCS keywords):
As for subtest 4.1.1, but the images shall be obtained with STANCAM.

Subtest 4.3.2 (request for and writing of headers for STANCAM/TCS):
As for subtest 4.1.2, but the system shall be TCS.

Subtests 4.4 (NOTCam) **Not an initial requirement:**

Subtest 4.4.1 (correct values for WCS keywords):
As for subtest 4.1.1, but only one image shall be obtained with NOCam, using the 'exp' command.

Subtest 4.4.2 (request for and writing of headers for NOTCam/TCS):
As for subtest 4.1.2, but the system shall be NOTCam.

Subtests 4.5 (MOSCA) **Not an initial requirement:**

Subtest 4.5.1 (correct values for WCS keywords):
As for subtest 4.1.1, but only images 1-4 and the images shall be obtained with MOSCA.

Subtest 4.5.2 (request for and writing of headers for MOSCA

	(FASU/TCS)): As for subtest 4.1.2, but the system shall be FASU.
Criterias	The result is acceptable and thus the test is PASSED when 1) The FITS header in the image file resulting from the exposure contains the WCS keywords described in ref.6 of the ODF-TEST document. 2) The FITS header containing the WCS keywords is the FITS headers of the extension where the pixel data it is representing are located. 3) The values of these keywords are identical to the values produced by the current “NOT2MEF” programme, given that the RA, DEC, FIELD, detector binning, detector x and y start of the readout window and amplifier information are the same as for the reference images taken with existing NOT instruments and processed by the “NOT2MEF” programme. The value of detector X and y start may vary with one (1) pixel due to the fact that pixel counting starts at 1 in the new system and 0 in the old system. 4) The “resume” of a previously paused exposure do not trigger the generation of a new WCS FITS header. The above criterias only need to be met by the systems mentioned in each of the subtests at the time. I.e. if the ALFOSC/FASU system is to be commissioned, only subtests 4.1 needs to be passed.
Result	❑ Subtest 4.1 PASSED. Tested by _____ on ____ / ____ 20____ Signed _____ ❑ Subtest 4.2 PASSED. Tested by _____ on ____ / ____ 20____ Signed _____ ❑ Subtest 4.3 PASSED. Tested by _____ on ____ / ____ 20____ Signed _____

	❑ Subtest 4.4 PASSED. Tested by _____ on ____ / ____ 20____ Signed _____ ❑ Subtest 4.5 PASSED. Tested by _____ on ____ / ____ 20____ Signed _____
Notes	
