HCFA MAINTENANCE REPORT

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Day 1 (June 21, 2006).

HCFA removed from the telescope cage and brought to the HARPS room.
Due to the Iodine cell explosion, internally the HCFA was found with some oxidized steel surfaces but in general it was reasonably clean. Fortunately all the motion and adjustment critical parts of the eight motion functions, such as sliding races and driving screws, were found in perfect condition without any oxidation. This was probably due to the protective action of the lubricant layer over these surfaces.
We decided to clean as much as possible the oxidized surfaces, but the disassembly into pieces of each function was decided only after driving-current measurement and listening of each drive.

Day 2 (June 22, 2006).

Constant current consumption (safely below the limit of each motor) and single pitched sound were measured/listened at the drives; ADC in/out, Iodine cell in/out, Dust cover, Fiber head carriage, Calibration mirror in/out and Neutral density wheel. Therefore, it was decided only to clean and slightly lubricate where necessary, no disassembly of these drives.

ADC prism1 and ADC prism2 (tel. light entrance) drives were found in bad condition. The current consumption was irregular and unpleasant screechy irregularly pitched sounds were listened. The prisms/housing/gear/bushing units were dismounted and found dirty. The phase of the toothed belt was kept for proper assembly. The bushings (brass aluminum interface) were cleaned and lubricated applying a very thin layer of special graphite based grease (recommended by WEC). The applied layer is thin enough to avoid migration to the prisms surfaces.
When cleaning the optical surfaces of the prisms we detected that prism2 was not glued to the housing in fact it was approximately 2mm out (it was hold in place only by friction). It was pushed back inside the housing and properly glued with to mini drops of anaerobic cement. The ADC was reassembled and tested measuring constant current consumption and clean sound. In fact it was only the sound of the motor and reduction gear.
We are confident that prism1 is properly phased to the encoder, however it is recommendable to test the ADC performance.

Day 3 (June 23, 2006).

The springs of the calibration fibers translation stages were replaced by stiffer ones and the unit remounted. Since long time a provisional very stiff spring was mounted in between the two X axis translation stages to make them stiffer, now it was removed. We will decide to remount it or not after the tests with the new springs inside the stages. The

Y axis stages were found operating in the limit of their range (springs with minimum compression). Shims plates (2mm thick) were added and the stages brought to mid range.

The complete adapter was vacuum cleaned inside.
All the optical surfaces inside the adapter were cleaned and inspected.
HAM fiber head was thoroughly cleaned and inspected.

Day 4 (June 24, 2006).

The adapter was brought to the observing floor and before mounting it all the functions were exercised via software watching their operation, this was with the top cover (ADC supporting plate) open (xterm at the cage).
The adapter was closed and mounted on the parking place at the cage.
The calibration fibers, CES head and HAM heads were mounted back.

TEST ThAr FRAMES AFTER THE HCFA MAINTENACE
June 26, 2006

Test Notes:

- Vacuum vessel pump off.
- After the maintenance we decided to test the adapter without the supplemental spring in between the cal fiber's translation stages but we found that even with the stiffer springs inside the stages it was not enough, relative movement between the fibers was observed. We mounted back the external spring, of course keeping the stiffer internal ones. Below the result.

Tel. Pos.	Drift A m/s	Drift B m/s	Flux ratio A	Flux ratio B
Z	0.240	0.404	1.000	1.000
Z	0.053	-0.026	1.000	1.000
N60	-0.043	-0.058	0.998	0.994
N60	-0.247	-0.002	1.000	1.000
Z	0.096	0.113	1.001	1.005
Z	0.232	0.054	1.001	1.000
S60	-0.032	-0.147	0.980	0.999
S60	0.063	0.150	0.999	1.000
Z	0.018	-0.100	1.013	1.000
Z	-0.023	-0.026	1.000	1.000
E60	-0.330	0.066	1.003	1.002
E60	0.196	0.046	1.000	1.000
Z	0.463	0.174	1.003	0.997
Z	0.391	0.167	1.003	0.998
W60	0.399	0.013	1.022	1.004
W60	-0.183	-0.302	1.000	1.001
Z	-0.473	0.083	0.983	0.997
Z	0.167	0.126	1.000	0.999