The clean up at third floor involved the assembly of a safe platform above the M7 coudé turret to enable optics crew and daycrew to disassemble the coudé stove pipe and all optics below, before any optical clean up was attempted. So, after all that was completed and back in place, #2 oil spill reared its ugly head! (late February). Three sources of oil were revealed from this leak.

- Oil was still migrating from the 5th floor level down the outside of the "stove pipe"!
- The space around the "stove pipe" between 3rd floor ceiling and 4th floor, had been stuffed with cloth, and of course, over the years, this cloth was now oil saturated and continuing to drip.
- Also, a short piece of tube, at 5th floor level, had not been in place, hence, oil spray from the telescope bearing area found its way right down the vertical tube, right onto the optics at 3rd floor level! Once again, big clean up!

Meanwhile, all the necessary arrangements were being made, to dispose of (correctly), all the contaminated waste materials resulting from the clean up. In essence, we are looking at $5K for the disposal of eight 55 gallon drums of waste material, plus a lingering ninth drum of $2K.

After yet another clean up, along came #3 oil spill! (Early March '93) So now, with nice new 10 micron filters in the line, coudé train all cleaned up, we had -10°C temperatures, with the net result, whatever moisture was mixed into the hydraulic oil from previous wet, soggy, dome conditions, once again the 10 micron filters were unable to handle the sluggish oil; result, oil once again on the third floor optics.

#3 (Final ?) Clean Up Procedure & Conclusions

- A seal/catchment tray was designed and fitted to the outside of the stove pipe at 4th floor crawl space level to prevent oil spillage getting any lower 4th floor level.
- Return oil from the south pier surface area is now piped down to the 1st floor level, held in a 44 gallon drum, filtered, and then pumped back into the telescope hydraulic oil reservoir on a daily basis.

P. Sydserff

Detector Developments

Through a collaboration with UH/IfA, we are offering a second 2048x2048 15 μm CCD to offset the demand on the Lick2 CCD. This new chip, known as Loral3, is a thick, front illuminated device with a blue sensitivity enhancement coating (Lumogen). Cosmetically, this chip is quite clean with performance very similar to the Lick2 CCD. We recommend this device in place of the SAIC1 1024x1024 CCD on HRCam projects and offer it with a 1200x1200 subarray that includes overscan in the row direction.

After a long and treacherous development path, we are now in the testing phase with a thinned 2048x2048 15μm pixel CCD, Loral4. As this chip requires UV flooding to stabilize QE, we will study the technique and results to ensure that when it is released it produces repeatable results. We hope to complete lab testing and release the Loral4 CCD during the summer. In parallel with on the development of the Loral4 CCD, we will continue progressing on the development of another camera built around a thinned Tektronix 1024x1024 24 μm CCD, Tek3. Both of these cameras will be operated with the new Generation III controller.

The baseline form of the Generation III controller has now been in use for several months and is working well. We have released it for operation of the Loral3 CCD as well as the Redeye IR cameras. Current efforts in this development are centered around improvements in the focusing software, system overhead optimization, expanding the use of multiple amplifier readouts (Redeye uses 4 amplifiers), developing lower noise techniques such as "skipper" readouts, and implementation of more utility card functions. Currently two Generation III controllers have been released at the telescope, one is stationed in the Waimea lab for detector development, and one is on loan to the MOCAM development team. Installation of a telescope-wide fiber optic cable network for use with the controller is underway to replace the temporary fibers now at all foci.

The CCD cameras now offered and those under development include those shown below.

C. Clark, S. Smith

Name	Format	Pixel	Noise	Controller	Comments
Loral3	2048x2048	15 μm	~7 thick	new	Lumogen coating for glue response
Lick2	2048x2048	15 μm	~7 thick	old	backup to Loral3
SAIC1	1024x1024	18 μm	~8 thick	old	backup to Loral3 on HRCam
PHX1	512x512	20 μm	~7 thick	old	Metachrome coating for blue response
RCA2	640x1024	15 μm	~50 thin	old	highest QE CCD
RCA4	640x1024	15 μm	~60 thin	old	flatter than RCA2, slightly lower QE
Loral4	2048x2048	15 μm	<10 thin	new	possible summer release
Tk3	1024x1024	24 μm	<10 thin	new	possible summer release

The New f/8 Focussing Mechanism Installation

The installation of the new f/8 focus mechanism has been completed and put into operation as of the 10th of May as scheduled. Removal of the old focus mechanism, component installation, cabling, testing, and the addition of balance weights to the top end ring were completed during an eight week period concurrently with the aluminizing of the f/8 mirror. Balance weights were added to the top end ring to compensate for the 1700 kg reduction of the new focus mechanism.

Once on the telescope, initial alignment checks indicated the focus mechanism had been fixtured into position within 1 mm of the desired translated and collimated location. Mirror cell translation capabilities were incorporated into the focus mechanism enabling final translation to within 0.1 mm of center. Collimation was accomplished by machining spacers which position the height of fixed pads located in the mirror cell. Using this procedure angular alignment was adjusted to within 5 arcsec at zenith.

Two nights were scheduled and used for tuning and testing the focus mechanism with excellent results. All design specifi-

cation requirements have been met. Lateral image motion, autoguider interruption, slow focus control, and focus repeatability problems have been eliminated. The new focus mechanism specifications are as follows:

- Total Z Motion /Secondary Mirror: ± 16 mm
- **FOCAL PLANE TRAVEL: ± 88 mm**
- Focus Mechanism Repeatability: ± 1.5 μm
- Resolution: 1 μm
- Incremental Movement Settings: 1/10 μm

Continued efforts to upgrade components of the existing f/8 mirror cell can be expected. Although not scheduled as yet, considerations are underway to possibly equip the mirror cell fixed pads with load cells and replace existing cosine vacuum and pressure regulators with electronically controlled regulators thus creating a closed loop system to more accurately maintain the f/8 mirror configuration through the entire range of telescope motion.

Finally, it is appropriate at this time to extend thanks and appreciation to all those who have committed their efforts, professionalism, and dedication to the success of this project.

D. Sabin

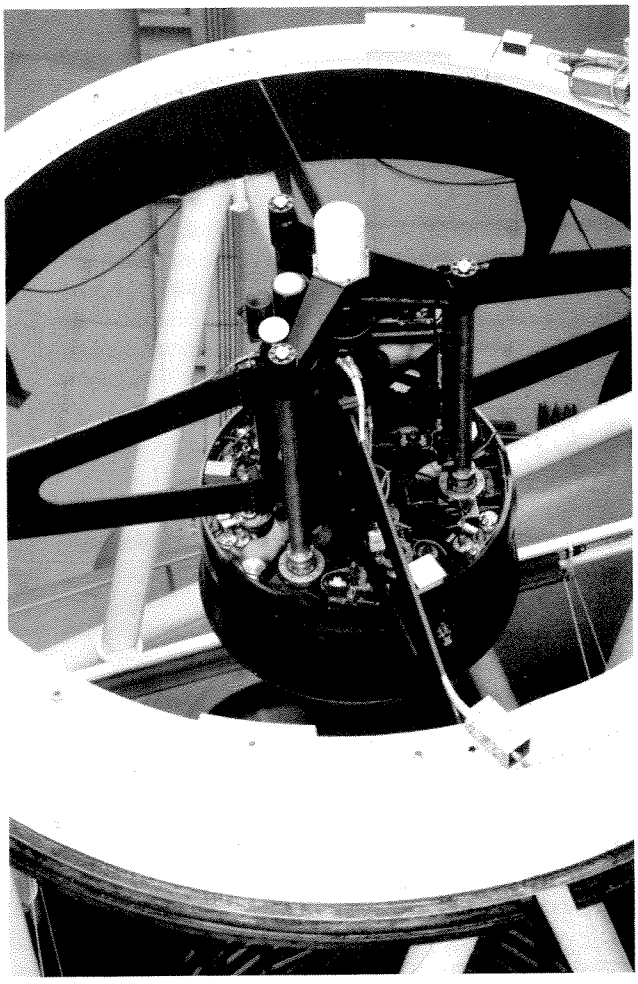

Figure 7.

CFHT Data Archival Update

The CFHT data archiving system has undergone some significant changes over the past several months.

- The original 800 Mbytes capacity Maxtor optical disk drives have been taken out of the active archive loop. They are kept running now only to service retrieval needs of data stored on the 800 Mbytes optical platters. The six Gbytes capacity Sony optical disk system is now the exclusive storage device for CFHT data. When an optical platter is filled, it is sent to the CADC to be entered into the CADC data base system. A temporary Exabyte tape backup is made of the optical platter prior to its shipment.
- A larger hard disk buffer area for data has been added to the archive host machine, which is located in Waimea. This makes it easier to handle "data storms" from the summit, thus, preventing disk overflow at the summit.
- The seeing quality data extracted from the fits files created by some instruments is now being made available to all CFHT personnel.
- It should be noted that user requests for CFHT data which has been sent to CADC, should be directed to CADC in the future.

A final note. Those of us who have worked on the archive system would like to thank Marc Sauvage for the excellent work he has done on the archive system. Marc has recently returned to France.

R. Link

f/35 New Upper End Installation

On March 2, 1990 at 15:30 hrs CFHT was proud to announce the installation of the new IR Upper End with the new focus unit and new f/35 mirror. This project started almost four years ago, with the manufacturing specifications for the new IR secondary mirror. Two years ago, the conceptual design studies on changing the IR focus unit began and now CFHT has entered a new regime. The focus unit was placed into service in a six week period.

Opto-mechanical alignment consisted of establishing the center-line between the primary and the secondary mirrors. The new design allowed the mirror center to be within 0.3 mm of the right alignment, whereas the old unit was 5 mm off-axis with no adjustment possibilities. Collimation proved to be the easiest procedure with the as-designed spherical surface bearing working according to expectations.

The new focus unit is currently running in a mirror chopping mode and is vibration free up to 30 Hz at 20 arcsec amplitude. The unit itself has a first bending vibrational mode at 160 Hz due to its design weight and stiffness. The focus resolution and repeatability are near 1 μm with a total focus travel of ± 22 mm. In May the Circus observing run reported "no image degradation due to seeing, only a stable single diffraction core surrounded by a broken ring with no measurable correlation time"; which speaks for itself!

E. Stokes