

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.

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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.

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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 speci-