Coude focus and instruments commissioned

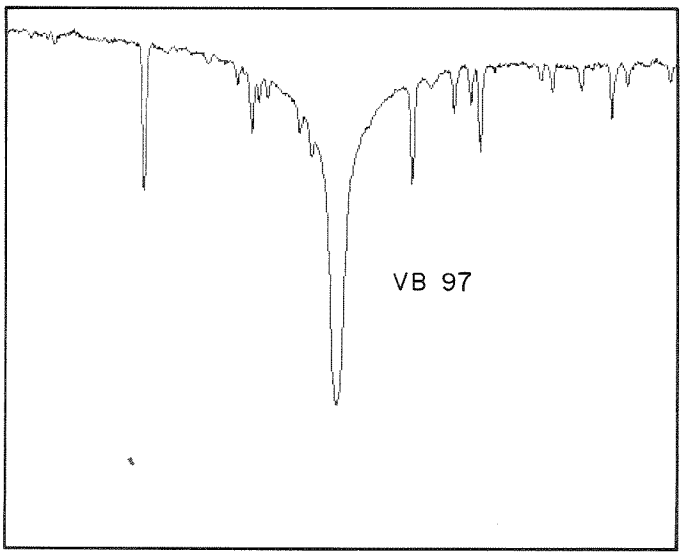
On the night of 26 August 1980, first light was seen at the coudé focus by J.C. Fouéré. To everyone's surprise the first star was found almost perfectly centered in the field - indicating that our optical team had done an excellent job of aligning the coudé train.

Walter Grundman and Harvey Richardson came from the DAO in August and September to install "Spectrograph f/7.4". (The actual f-ratio is more like 8.2, since the 60 cm temporary camera has longer focal length than the final 1.8 m mirror, which will permit 80 cm long spectra). The spectrograph set-up and alignment went about as planned, with Harvey making the last adjustments just before the first test exposures of stars were taken. These indicated that the spectrograph behaved more or less as expected.

Meanwhile, the CFHT Reticon systems arrived from UBC last August for testing. A number of bugs had to be ironed out in the succeeding months, and a few persisted right up to the time of the first scientific observing run. Fortunately this run was a joint effort by Bruce Campbell of CFHT and Gordon Walker, Stephenson Yang, and Ron Johnson of UBC. With their combined efforts the 1872 Reticon was put in working order.

The first run also required the hydrogen fluoride cell which Bruce Campbell had been constructing this summer at the summit. This run turned out to be remarkably successful, considering all the preparations required. Some useful data were collected even though this was the first real test of the coudé train (with uncertain pointing corrections), the coudé spectrograph, the Reticon system, the DAIC computer, and the hydrogen fluoride cell!

Gordon Walker and Bruce Campbell, supervised by Ron Johnson, make a valiant effort to get the Reticon system working.



Portion of Reticon spectrum at Hα for G1V Hyades dwarf van Buren 97 obtained by R. and G. Cayrel and B. Campbell. Signal-to-noise ratio in the continuum is about 300:1.

Alan Batten subsequently arrived to take the first scientific photographic spectra. Despite problems with spectrograph focus and slit viewers, he was able to obtain plates for his continuing program of stellar radial velocities. He reported that the speed was about as he expected - 3 to 4 times faster than the 48-inch coudé at Victoria. Françoise Praderie then came with a program to study line profiles of Herbig Ae stars at high resolution. She was disappointed with the viewing system of the spectrograph. Nevertheless, with Ann Boesgaard and A. Talavera she took plates up to 3100 A of AB Aur., a shell star of V=7. The attempts on a 10 mag star with a 2-hour exposure were unsuccessful.

During the following period of prime focus observations the aluminum coated coudé flats were exchanged for the silver coated mirrors. It was hoped that this would increase the speed in the red, which had been somewhat disappointing. The next run with the Reticon showed that the speed had gone up by a factor of 8! Fortunately, it was then possible for Roger and Giusa Cayrel and Bruce Campbell to do their program of Reticon spectroscopy of Hyades G dwarfs. All were relieved that the Cayrels could take home some excellent data from their first official run on the telescope.

F. and C. Roddier, and J. Vernin installed a shearing interferometer at the coudé focus. This was used to determine the diameter of bright stars. They obtained 12 measurements of the diameter of αOri at different wavelengths between 4600 and 6800 Å, and recorded data to enable determination of the limb darkening at 3 different wavelengths. From a quick look at the data the diameter of the αOri was found to be smaller than expected from speckle interferometry.

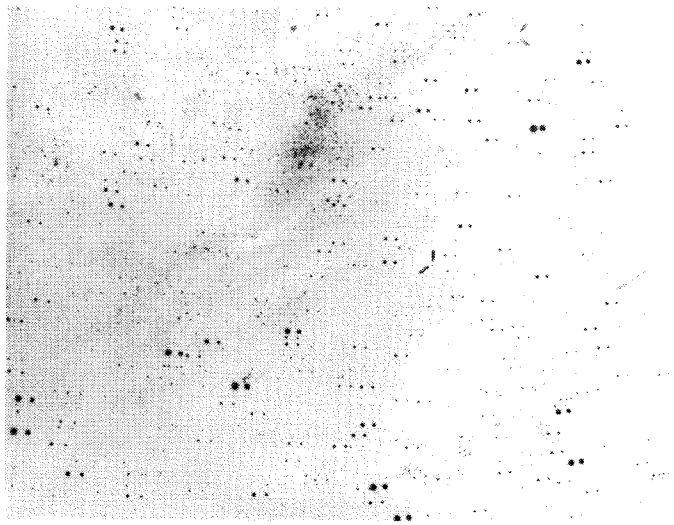
The coudé train will have push-button interchangeable mirrors at the six small mirror positions by the spring of 1981. Each turret will carry high reflectance coated mirrors for the red/near infrared, extended blue (340-500 nm), and ultraviolet (300-400 nm) spectral regions. The speed with the present red mirror train plus Reticon seems to be very good; a spectrum with signal-to-noise ratio 100 for a star with R = 5 at 4.8 Å/mm dispersion at Hα takes about 6 minutes. The seeing at the f/20 coudé focus is typically about 1 arc second, but there is some image motion due to turbulence in the beam. This may be reduced in future by insulating the "chimney" between the coudé (3rd) and observing (5th) floors, and attention to heat leaks in the dome. Some improvement is also expected when the red, blue, and ultraviolet coated image slicers are received. We expect then to have a fast and efficient coudé system.

Observations at the prime focus

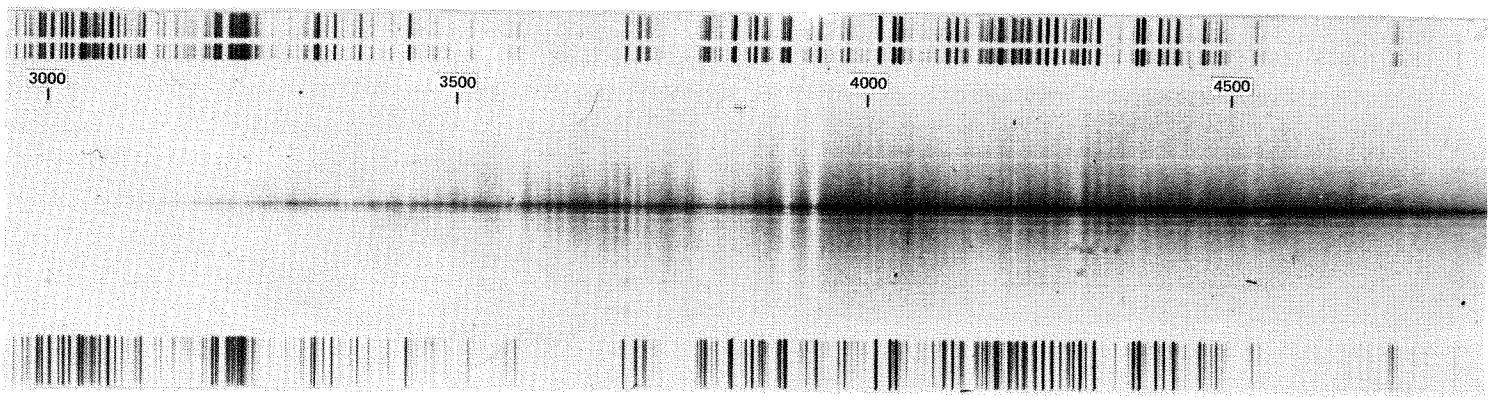
Of the 21 observing runs for the past semester, 15 were for the prime focus. Most of these used the wide field corrector for direct photography to take advantage of the large field size (55 x 55 arc minutes) and exceptional quality of the seeing available most of the time.

On the latter point the most dramatic result was obtained by L. Thompson during his observing run at the beginning of November, with reported image sizes of 0.6 arc second.

Moffat and Shara, Hardy, and Madore were also very pleased with the results they obtained. Madore was able to obtain 40 plates of different globular clusters on 3 nights. P. Véron may have been a little disappointed in his search of active galactic nuclei, but the diameter of the images measured on his plates corresponded to images of 1.5 arc sec or less. His program involved taking short exposures (1 to 10 minutes) at the prime focus. There was concern about losing time with frequent reloading of plateholders, but this problem was solved by adding a focal screen permitting 4 fields to be taken on the same 10" x 10" plate. In this way he was able to get pictures of 80 fields in 5 nights.



This picture by Moffat and Shara is a combination of 2 plates of the same object - here only a small portion of the southwest arm of M31 - made by printing, slightly displaced, a short exposure in B and a long exposure through a narrow band filter at 4670A. Every stellar image should appear double; that happens except for a few stars which are almost invisible on the B plate but present much brighter images on the 4670A plate. These can be considered as Wolf-Rayet candidates.



Spectrum of M31 obtained with UV Prime spectrograph in ultraviolet. The slit, 4.2 arc minutes high, is aligned along the minor axis of the bulge. Exposure time is 2h 30m on baked IIaO film.