Intendente for the IV Region, Mr. Fuentealba, as well as the mayors of La Serena and Coquimbo paid visits to our stand.

At this highly successful fair, ESO astronomer Patrice Bouchet and night assistants Eduardo Matamoros and Rolando Vega together with Jorge Peralta took turns at the stand . . .

Finally, at the closing ceremony, ESO was awarded a special distinction for its presentation, also a sign of the interest by the public in the activities of our organization.

Not counting the Penuelas fair, which as usual attracted some 80,000 visitors, the ESO exhibition has until now been seen by more than 250,000 people during its South America tour.

In Europe, the exhibition at the Planetarium in Berlin has been a major success, and to satisfy the public demand, the exhibition has been extended beyond the originally foreseen closing date of March 1, 1992.

Among the upcoming events are complete exhibitions and fair stands in Milan (Italy), Jena (Germany), as well as Antofagasta and Santiago de Chile.

C. MADSEN, ESO

The 3 × 4.5 metre giant model of the Very Large Telescope on Paranal arrives at the ESO Headquarters on February 6, 1992. Here it was outfitted with computer and video equipment before continuing to Seville in early March. It was built in record time by the Swedish firm Linovation and also shows the new enclosures, as decided late last year. The model incorporates a projection system by means of which VLT video films can be shown on a wall behind the model. The videos are stored on a computer-controlled videodisk and activated by the visitors.

NEWS FROM THE VLT ADAPTIVE OPTICS PROTOTYPE PROJECT:

A New Photon Counting Wavefront Sensor Channel for COME ON PLUS

N. HUBIN and E. GENDRON, ESO

As part of the upgrading programme of the VLT adaptive optics prototype system, called COME ON PLUS (see *The Messenger* Nos. **60** and **65**), the wavefront sensor (WFS) channel is currently redesigned. In the new configuration two visible WFS channels can be selected from the observing room via a remote control: one channel for star magnitudes in the visible up to 11 equipped with an intensified Reticon array and a second channel for star magnitudes from 9 up to the limiting magnitude of 15 equipped with an electron bombarded CCD (EBCCD). This configuration allows to overcome the limited signal dynamics of the EBCCD low flux detector.

The EBCCD tube, developed at Laboratoires d'Electronique Philips (LEP) is derived from a Philips first-generation image-intensifier tube (see Figure). It is a single-stage triode tube including a thinned back side directly bombarded CCD (604×288 pixels) instead of the phosphor screen. A cooled S25 photocathode reduces the dark current down to 35 e/frame/s. The intensification factor can be selected from 100 to 1400. It is particular of this tube that the gain is very accurately defined compared to the enormous gain dispersion of other intensification schemes

Figure 1: *Tube assembly of the electron-bombarded CCD built by LEP.*

due to the intermediate phosphor stage: this property makes the EBCCD tube quasi perfectly quantum noise limited, without any temporal constraints in the number of photons per time unit.

The limited photon noise is of great importance for the optimization of the modal control scheme currently being implemented in COME ON PLUS. In particular, it will allow to decorrelate the number of modes corrected by the deformable mirror from the number of subapertures needed for the wavefront measurement. This number of subapertures is kept fixed, whatever the observing conditions are, even for very low signal-to-noise ratio. A programmable integration time (2.5 to 40 ms) is provided in order to cope with low flux levels.

The first performance tests under real observing conditions with the EBCCD integrated in the upgraded COME ON PLUS system are planned for September/October 1992.

A New Cross Disperser for CASPEC

L. PASQUINI, G. RUPPRECHT, A. GILLIOTTE and J.-L. LIZON, ESO

1. Introduction

In an earlier report about the upgrading of CASPEC, the Cassegrain Echelle Spectrograph attached at the 3.6-m telescope, the future installation of a new RED cross disperser was announced (Pasquini and Gilliotte, 1991).

The main reason for the need of a RED cross disperser was that the overall CASPEC capabilities at wavelengths longer than ~600 nm were rather poor, despite the good efficiency of the Tektronix chip at these wavelengths (CCD # 16). Because the principal cause of poor efficiency was the low response of the standard (hereafter BLUE) cross disperser, a new grating was acquired having the peak efficiency in the red part of the spectrum.

The cross disperser for CASPEC is formed by a mosaic of two gratings; they were assembled and aligned in Garching and the mosaic arrived at La Silla at the end of 1991. The characteristics of the cross disperser are given in Table 1 and its efficiency curve is shown in Figure 1.

Due to problems occurred during the Garching–La Silla transfer, it was necessary to re-install the cross disperser in its support at La Silla and at the beginning of January the mosaic was successfully mounted and tested on CASPEC with the Short Camera.

2. Performance

The optical quality of the grating is very good, and the spectra are free of ghosts and internal reflections.

Table 1: *Characteristics of the red cross disperser grating*

Groove density	158/mm
Blaze wavelength	800 nm
Blaze angle	3°38′

The instrument configuration is rather stable. In particular the counterweight system, which is similar to that used with the BLUE cross disperser, was found to work properly.

The spectral range covered in one frame is large, about 280 nm with the Tektronix CCD actually mounted on CASPEC. This of course implies that the order separation is rather small (about a factor 2 smaller than with the BLUE cross disperser). The order separation as a function of the order number is given in Figure 2. For wavelengths below 550 nm this separation is less than about 6 arcseconds (the spatial scale with the short camera is of 24 arcsec/mm in the direction perpendicular to the dispersion).

This implies that below ~550 nm the RED cross disperser can be hardly used, and that only with a very short slit can order confusion be avoided. As a consequence, *for observing programmes which require BLUE and RED spectra in the same night the RED cross disperser is not suitable.* The small interorder space must be taken into account also for all applications requiring a proper sky subtraction.

As expected, the CASPEC efficiency in the red is greatly enhanced: the efficiency of the Short Camera + RED Cross disperser + CCD 16 has been measured through observations of standard stars and is given in Figure 3 (filled triangles).

During the same test run the efficiency of the Short Camera + BLUE cross disperser + CCD 16 was also measured,

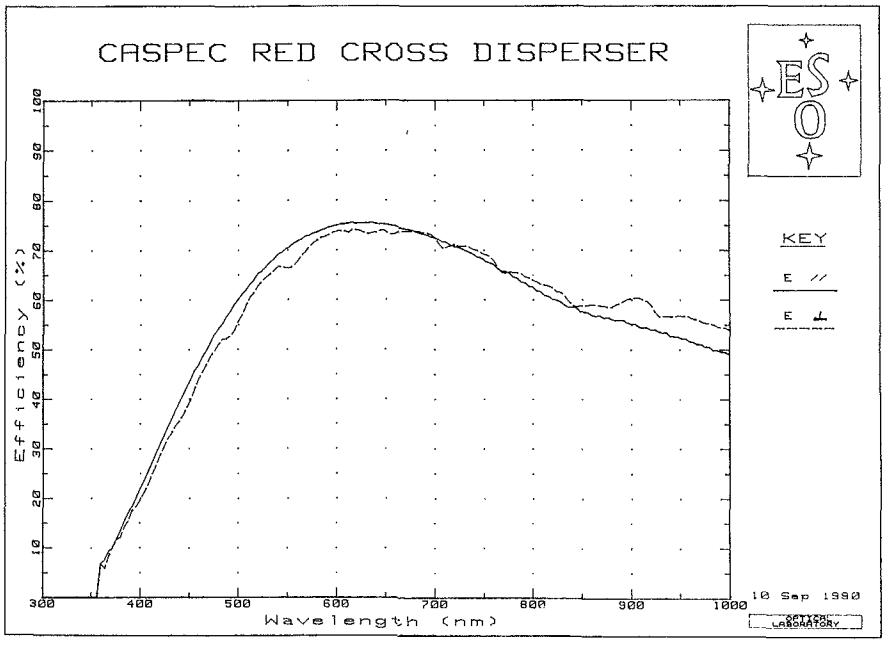

Figure 1: *Efficiency curves for the RED cross disperser for polarization parallel and perpendicular to the grooves.*