The CASPEC programmes make use of a new data acquisition system (called DAQ) developed at ESO to easily transfer detector packages (like that of the CCD) to various instruments and instrument packages to different telescopes. CASPEC is the first instrument developed within this new frame but the software for the new B & C spectrograph for the 2.2 m telescope and for EFOCS, the faint object spectrograph for the 3.6 m are being implemented now along the same lines.

The Bright and Dark Sides of the CCD

The performance of the CCD chip which is currently used at CASPEC is in general quite satisfactory. The read-out noise is 40 e^-/pixel, the dark current 15 e^-/hour/pixel at T = 150°K. The quantum efficiency peaks at λ5000 with 60 % and is 15 % and 25 % at 3500 Å and 9000 Å respectively. These values were measured on the detector test bench in Garching. There the CCD was also found to be linear within 0.1 %.

On the dark side, this CCD shows a degraded horizontal charge transfer when a spectral image is formed on a dark background. This results, e.g., in a low amplitude tail at the right side of a comparison spectrum line. This effect can be eliminated by exposing the chip uniformly to a low level of light, at the price, however, of introducing additional noise to the image. In the present configuration the effect is perpendicular to the dispersion direction. Two hot areas, whose intensities increase linearly with time, are also observed on the border of the CCD. The charge spread which they produce is not severe for exposure times up to two hours. More annoying are the randomly distributed, non-reproducible spikes whose number rises with exposure time at a rate of about 2/minute. The only possible explanation are cosmic rays, but their frequency is about twice that quoted in the literature.

The most severe problem of the CCD remains however that of the "fringes" which are produced by light interference within the chip and result in a reduction of the sensitivity at a given wavelength and position. For this chip, they are as high as 30 % in the red. In the scarce literature on spectroscopic use of the CCDs which is available, it is stated that they can be accurately flat-fielded. In our case, the process is made more complicated by the existence of a background of bias and scattered light which has to be subtracted before the star spectrum is divided by the flat field image from the quartz lamp. When these problems are taken into account, our preliminary reductions indicate that an accuracy of at least 1 % can be achieved in the flat-field correction.

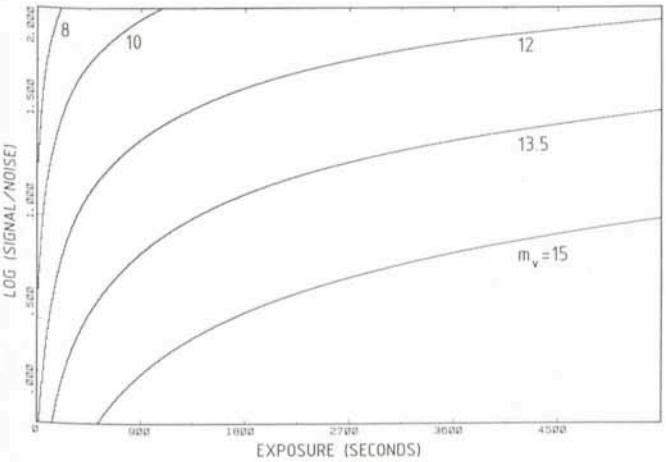

Fig. 1: *The predictions for signal/noise ratios as a function of exposure time for stars of different magnitudes at λ5000 Å. Photon statistics and the read-out noise of the CCD (50 electrons) were considered as sources of noise. These predictions were made a few months before the test observations. They were found to provide useful guidelines for the actual observations under very good seeing conditions (FWHI ≤ 1 arcsec). With larger images, both the loss of light and the spread over more pixels perpendicular to the dispersion partially degrade the S/N of the observations.*

Tentative Time-table of Council Sessions and Committee Meetings Until December 1983

November 8	Scientific and Technical Committee
November 9–10	Finance Committee
November 11	Committee of Council
November 29–30	Observing Programmes Committee
December 1–2	Council

All meetings will take place at ESO in Garching.

The First Astronomical Results

The test observations indicate that the main goal of the CASPEC project, i.e. relatively high dispersion spectroscopy on faint objects, has been achieved. Fig. 1 can be used as a guideline for limiting magnitudes, and S/N ratios. Observations at good signal to noise of the continuum of objects as faint as m_v = 14 have easily been achieved with average seeing conditions. Emission lines have been observed in objects of fainter magnitudes. Fig. 2 shows one such observation. CASPEC definitely gives new possibilities to European astronomers and its capabilities appear rather good when compared with the performances of similar instruments, such as the Kitt Peak or MMT echelle spectrographs. The programmes which become feasible cover quite different topics in astrophysics. One can mention the study of interstellar lines in the Magellanic Clouds stars, the determination of abundances of stars in globular clusters and in the halo, the study of the velocity profiles in emission line galaxies, stars, quasars and supernova remnants, but this list is obviously incomplete.

While a large amount of original work can certainly be done with the present instrument configuration, one has also to be aware of its limitations. Fig. 3 shows that the higher resolution of the CAT + CES combination is worth being used when one

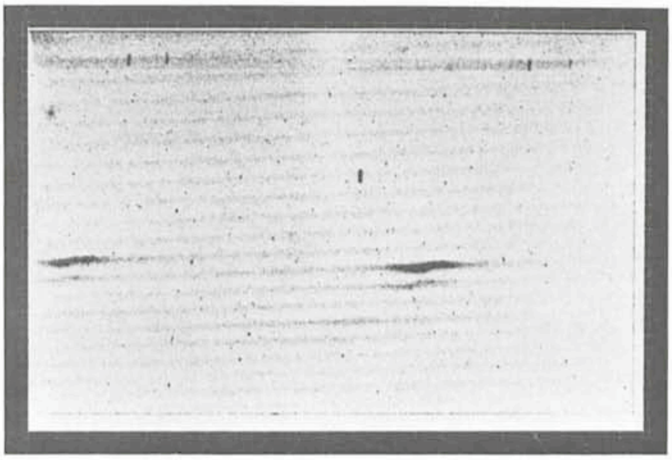

Fig. 2: *A 130-minute CASPEC exposure of the approximately 14th magnitude quasar MR 2251–178. The entrance aperture measured 2.1 × 5 arcsec on the sky. The H_β and [OIII] λλ 4959, 5007 lines (well visible in two different orders) as well as the narrow λ 5577, λ 5890–96 Å sky lines are present in the spectrum.*