

# The ESO VAX Computer's Largest Peripheral... – a Two-Ton Milling Machine

S. BALON and G. LUND, ESO

D. CHITTIM, ESO (Benney Electronics)

The Garching workshop has now for some time been equipped with a "CNC" (programmable) precision milling machine, which has proven extremely useful not only for routine machining work, but also for the rather monotonous and extremely time-consuming task of preparing starplates for OPTOPUS observation runs (see also the *Messenger* No. 31 p. 13 [1983]). In the preparation of a single observation run, a total of some 1,500 precision-reamed holes must be machined, each requiring 9 different drilling operations and something like 24,000 lines of machine instructions.

Until recently, the machining instructions for each starplate were prepared by computer and tediously transferred to the milling machine via an intermediary cassette recorder. Programmes could not exceed a certain size because of the limited cassette length, and data errors introduced during recording had to be corrected by returning to the computer and repeating the whole data-transfer process.

These difficulties have now been overcome by the development of data-transfer software which enables a programme of any length to be fed directly from the VAX computer to the milling machine, via a standard RS 232 data cable. The data transfer is initialized from a terminal situated in the workshop, enabling any errors in programme formatting to be corrected with ease by use of the text editor.

The VAX-workshop transfer facility also offers the possibility of formulating long machining sequences in advance (with the text editor), whilst the machine is occupied with different tasks. Frequently used programmes or programme sub-cycles can be stored and recalled at ease.

Perhaps the most intriguing feature which could be implemented via the computer-workshop link is the possibility of using CAD design data (from the Drawing Office) to drive the CNC machine, via specialized data conversion software.

Undoubtedly, it will not be long before the size of this VAX peripheral is dwarfed by that of remotely-commanded telescopes in Chile!

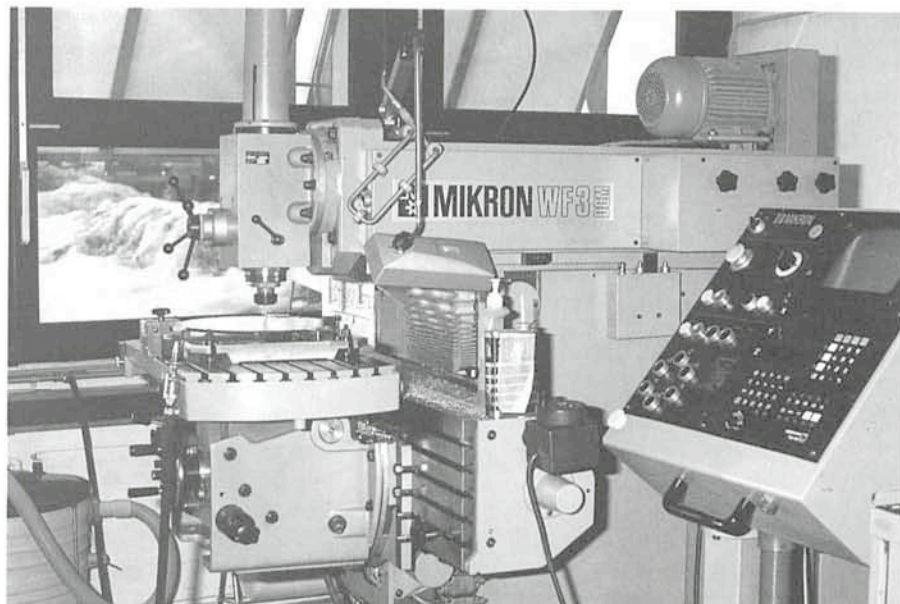


Figure 1: General view of the MIKRON "CNC" programmable milling machine at the workshop in Garching.

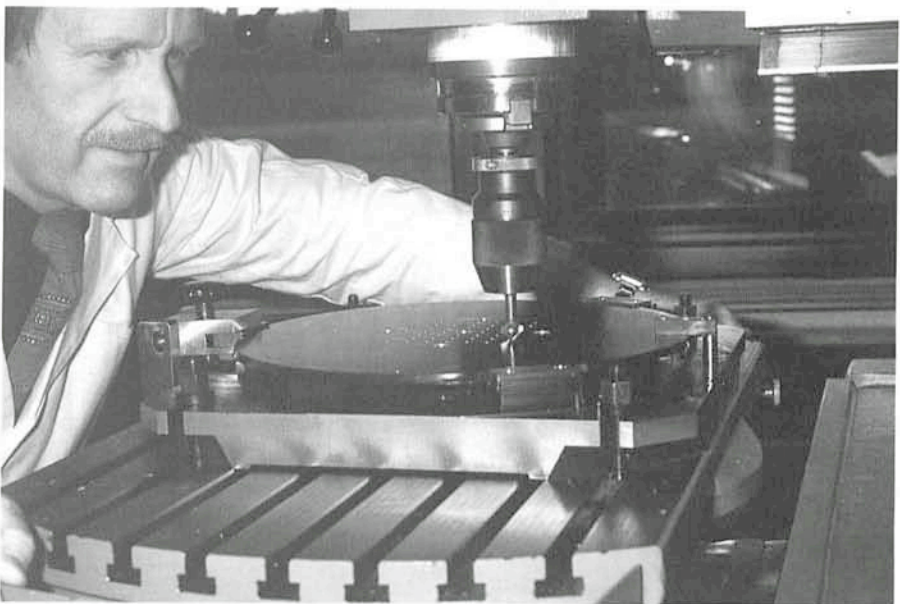


Figure 2: Close-up view of an OPTOPUS "starplate" being machined at the workshop in Garching. The programmable milling machine is ideal for this type of work requiring frequently repeated machining sequences.

## MIDAS Memo

ESO, Image Processing Group

### 1. Application Developments

The FITS encode and decode routines in MIDAS have been upgraded to include full support of the Table Exten-

sions (R. Harten et al. 1985, *Mem.S.A.It.* 56, p. 436). All descriptor information associated with MIDAS files is now encoded in the FITS header as HISTORY cards. Further, the original file names of