

PROPOSAL FOR HARDWARE FOR A NEW MIDI-CONSOLE

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1. INTRODUCTION

This note gives a short description of the hardware for a new type of Midi-Console which CCI propose to build and interface to the Front End Computers of the new MPS Control System. For details of the various components the reader should refer to the forthcoming documentation on "New Midi-Console Hardware". In principle, the design of the console is based on the description of the small console given in Ref. 1, the equipment proposed being the same. For details on the implementation see chapter 7.

The constituent parts of the new Midi-Console will be :

- an alphanumeric colour video display,
- a touch panel unit,
- four shaft encoders,
- a keyboard.

All these devices will be interfaced to the FEC via CAMAC.

2. ALPHANUMERIC DISPLAY

This unit is expected to be the main output medium to the operator. The equipment includes a CAMAC output register, a display controller and a video monitor. A block diagram is given in Fig. 1. The computer sends data, such as character codes, via the CAMAC register to the display controller which translates this data into video signals which are then sent to the monitor. The display controller should accept full ASCII plus a number of special user-defined symbols.

The equipment proposed is :

- CAMAC : input/output register type SPS 2090. This is a 16-bit parallel I/O register designed for SPS and manufactured by Nuclear Enterprises Ltd.
- Christian Røvsing A/S colour TV display controller : This uses the full ASCII character set plus 32 user-defined symbols. The controller should be preset to give 48 (or 40 as a second choice) characters per line as this is thought to give an easily readable display.
- SONY Trinitron colour video monitor : Here there are two possible units - either the Lan-scope 313 or the Tektronix 650 series. They are generally similar except that the Tektronix is significantly dearer but is thought to have better quality electronics. The monitor has four colours (red, green, blue, white) but the blue is not easy to distinguish and we would use magenta instead (magenta = blue + red).

3. TOUCH PANEL UNIT (Ref. 2)

This unit will be used to access process variables via a "tree" structure, to call up programs, to select program options and so on. A block diagram is given in Fig. 2. The touch panel has a number of buttons, each of which correspond to an area on the display screen on which is written the name of this button. Thus the TV display is driven by a character generator which is in turn driven by a CAMAC output module. Selecting a button will cause a LAM via a CAMAC input module which also reads in the button number.

The equipment proposed is :

- CAMAC : terminal driver JTY 20 manufactured by SAIP - Schlumberger.
- Ann Arbor R2050C character generator : This will use the full ASCII set of characters and output a video (black and white) signal.
- Conrac video monitor (black and white only).
- A touch sensitive screen (made by Eo roperm) and a digitising electronic circuit, both of which have been designed by Lab. II
- CAMAC : parallel input gate SPS 2133. This unit was designed by SPS and is built by Nuclear Enterprises Ltd. as NE 9049.

4. SHAFT ENCODERS

These will be of the type currently used today both in PS and SPS. They are manufactured by Leine and Linde. They will be interfaced via SEN 2IPE 2019 Dual Incremental Position Encoder modules. There will be 4 shaft encoders on a console.

5. KEYBOARD

This will be used, for example, for ESAU input, either when the FEC is run in Lab. computer mode or perhaps in normal or stand-alone modes, if ESAU is made available in these last two modes. We note that the keyboard is physically and logically separate from the display and from the touch panel but, as a user option, it may be echoed by the FEC on to either display.

The keyboard is manufactured by Mechanical Enterprises with a character set to be defined by us (see next section). It will be interfaced via an SPS 2090 16-bit I/O register (as described above).

6. CHARACTER SET

We note that there must be a clearly-defined standard MPS character set. Only this set, or a subset of it (for example omitting special characters), should be used on the various keyboards and character displays. The set should be defined in the near future and agreed upon by all interested parties.

7. IMPLEMENTATION

Implementation of the new console will be done in 2 stages. Stage 1 will be to buy the hardware and write the necessary driver routines. Stage 2 will be to define the modes of use of the equipment and write the appropriate tasks. For example, will the shaft encoder work in absolute and/or incremental mode; will its value and associated parameter be written on the display screen, and so on.

Although the planning for stage 2 is not yet complete, it has advanced to a point at which we can buy and begin implementing the hardware necessary, while at the same time continuing our studies to define the exact modes of its use.

ACKNOWLEDGEMENTS

It is a pleasure to acknowledge the advice and assistance given by U. Tallgren of Linac and S. Summerhill of Lab. II, both of whom have done much of the initial designs and market studies for the various parts of this proposal.

REFERENCES

1. Proposed control system for the new Linac, U. Tallgren, MPS/LIN/Note 74-6.
2. 2 devices for operator interaction in the central control room of the SPS, Beck and Stumpe, Yellow Report 73-6.

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FIG. 1 - COLOUR ALPHANUMERIC DISPLAY UNIT

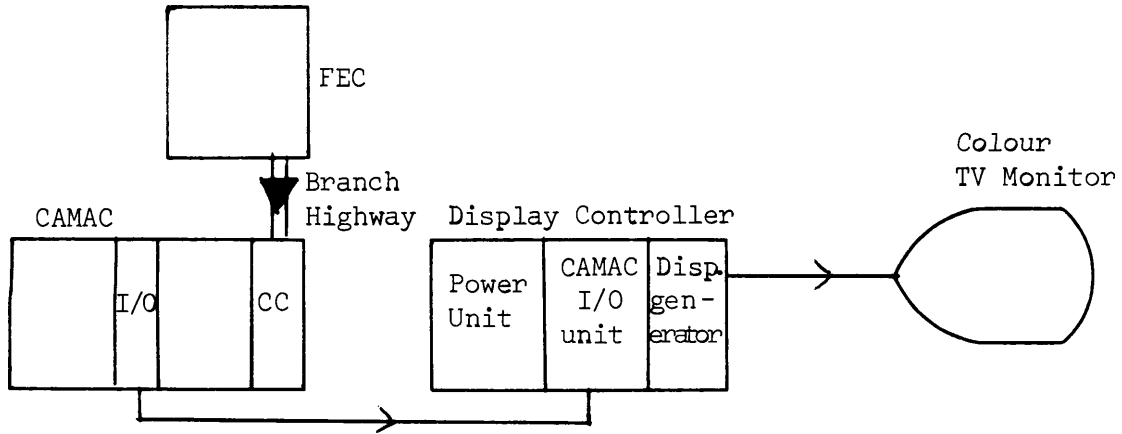


FIG. 2 - TOUCH PANEL UNIT

