Microprofessor MPF-1P reviewed

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This complete microcomputer system gives step-by-step hands-on instructions into all aspects of the Z-80 microprocessor. Optional extras give it a wide range of practical applications.

The MPF-1P Microprofessor. This is based on the Z-80 CPU, operates at 1.79 MHz and has on-board 4K RAM and 8K ROM. Other features are a 49-key keyboard, built-in speaker, interface for program storage/reading to and from cassette, 20-digit, 14-segment alphanumerical green tube display, 48 input/output lines, battery backup for the RAM contents, buss-expandable Z80 architecture and three user manuals.

MANY READERS of ETI will be acquainted, either first hand or through reviews, with the Microprofessor MPF-1B trainer. This is an educational microprocessor development system which can be used by the computer buff as a self-teaching aid for micros.

Multitech have done it again and come up with a higher level model (at a higher price), incorporating a much expanded monitor as well as a viable 8K interpreter option.

Designated the MPF-1P (for PLUS) it features a 16-segment display of twenty characters which will scroll to forty. This display is similar to the incandescent displays of some of the new portable computers and the Texas Instruments' 'Speak and Spell'.

The unit comes in the same presentation

as the standard MPF-1, a compact look-like package with the processor board in residence. There is mounting space for another full-size or two half-size accessory boards laid out in a very concise and accessible unit. The only ergonomic disadvantage is the tangle of wires and power supplies required to power a three-board system.

There is a full range of accessory boards including printer, EPROM programmer, interface and memory board, speech and sound generation boards. A TV interface board is mentioned in a glossy brochure. However, no further details were available on this interesting option which promises to make the Microprofessor one of the most useful development systems available.

The standard of manufacture is of the highest order. The quality of the circuit
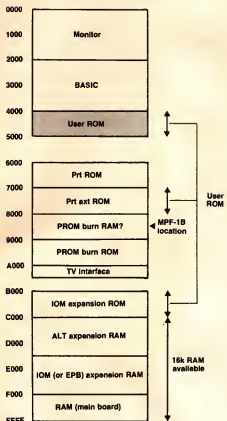
boards is A1 and they are particularly well laid out, especially where cutting and jumpering is necessry to accommodate different types of memory chips.

MPF-1P monitors

When the unit is switched on the display comes up with 'MPF-1P'. To enter the monitor, key-in a CONTROL plus the appropriate letter from the keyboard. This drops the system into the selected section of the monitor; for example, into the two-pass assembler or text editor.

The expanded monitor provides a broad range of facilities which make it a more advanced design compared to the older MPF-1B. However, this added facility makes it more complicated. It results in an advanced piece of hardware which is less of a starter system and more of a software

MPF-1P

```
0000
1000    Monitor
2000
3000    BASIC
4000
        User ROM
5000
6000    Prt ROM
7000    Prt ext ROM
8000    PROM burn RAM?        User
9000    PROM burn ROM         ROM
A000    TV interface
B000    IOM expansion ROM
C000    ALT expansion RAM
D000                          16k RAM
E000    IOM (or EPB) expansion RAM    available
F000
        RAM (main board)
FFFF
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This area of ROM occupies U4 which alternatively can contain RAM at F000-F7FF. (This is usually the less desirable choice)

design apparatus than the MPF-1B.

The monitor of the MPF-1B is restricted to operating the machine. So it is more limited in what it can do but its operation is easier to understand.

As you probably know, the monitor is the software, usually resident at the bottom of the memory, which controls particular operations; i.e: when the user is accessing the system via the keyboard or during initialisation after the micro has been turned on or reset. At other times the computer may be under the control of a user program, either directly or via an interpreter. These may access the monitor subroutines for such purposes as display or data input.

In other words, the monitor acts as a general housekeeper, looking after certain facets of the machine's operation. It is possible to load data into desired memory locations via the monitor, either directly from the keyboard or from a tape recorder.

Functions provided by the MPF-1P monitor also include a text editor, as well as a line assembler and two-pass assembler which will process assembly language including symbolic addresses.

Documentation

Included with the Microprofessor is a User's manual, Monitor Program Source Listing manual and an Experiment manual. Multitech has produced well-detailed documentation in the MPF-1P Monitor Program Source Listing manual. However,

the lack of circuit diagrams, as are available in the MPF-1B User's manual, is a significant limitation for the hardware buff.

It seems to be an oversight that these circuit diagrams are missing. From an educational point of view these are necessary, and a lot of the MPF-1P applications involve the construction of interfaces to mate with the real world. The User's manual is very well detailed but it would be easier to understand if it had a different format. Now it is necessary to jump from the back to the front in order to find out how to enter a program via the two-pass assembler. Thus it requires several passes through the book for things to gel in the reader's mind.

On page 100 an example is given which should have beenin the two pages. This example helps to hang some of the material together; loading an assembly language program to enter it and the assembler to process and lodge the machine code in memory.

The Experimental manual is much the same as that for the MPF-1B. The section on the Counter/Timer Chip (CTC) has been transferred to the interface manual which comes with the Input/Output and Memory board (IOM).

The Experimental manual is a good introduction to machine language programming, ranging from binary arithmetic experiments through to how to program a clock.

The documentation occasionally lapses into a sort of Chinese-English language which does not make it easy to understand. There seems to be a need in Taiwan (and Japan) for people whose native language is English to write the manuals. Many larger Japanese companies, however, have seen the light and their equipment manuals are well written in English.

In spite of these shortcomings, the information is adequate and quite well indexed.

Options

The IOM board is an interface option for the MPF-1P and provides the Parallel I/O chip (PIO), the Counter/Timer Chip (CTC) and the Communication Interface Chip (USART 8251). Thus experiments in both parallel and serial interfacing are possible.

This option will not be detailed here since the handbook for the review machine was a draft issue only. It does have an extra 6K RAM and 4K ROM to expand the memory space (see memory map).
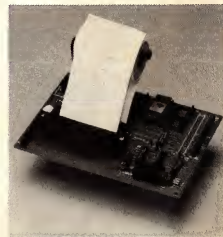
The printer accessory for MPF-1P is a 20-column matrix thermal printer with resident monitor EPROM and disassembler. The only significant difference from the MPF-1B's printer is the monitor software. There is, similarly, a vacant EPROM socket for the user.

It will list both BASIC and assembly language programs; the latter are input via the assembler, or disassembled from machine code. A limited graphical capability using the TAB function is possible, as well as the listing of data and results.

BASIC is supplied as an optional extra on EPROM and seems to be on a par with any other 8K floating point BASIC. It does

IOM-MPF-1P Input/Output and Memory board. This provides the Counter-Timer chip, the Communication Interface chip and the Parallel I/O chip kits to interface with the outside environment. It provides an extra 6K RAM and 4K ROM.

PRT-MPF-1P printer. The optional micro-thermal 5x7 dot matrix printer has 4K control ROM and prints 20 characters per line. There is an optional 4K user EPROM and it has a built-in memory dump facility and disassembler-listing utility.

contain library functions such as SIN and RND, however, details will not be given as the handbook was not availble.

Conclusion

The MPF-1P is a most impressive piece of educational hardware, substantially fulfilling its obvious roles as both an assembly language trainer/controller and easily interfaced BASIC-language computer.

As a first-off piece of hardware for the neophyte it has certain limitations which its predecessor did not have. However, these are balanced by its strengths such as a good BASIC interpreter and a more versatile range of peripherals.

Many organisations have already entered microprocessor training via the MPF-1B. The MPF-1P provides a logical step forward for the advanced trainees, complementing the MPF-1B.●