

SEMICONDUCTOR UPDATE

By R.W. COLES

SC/MP
MC904

SCAMP

"Scamp" is the way you say SC/MP, and SC/MP stands for Simple, Cost-effective, Micro-Processor, and really, I couldn't have put it better myself, because this really is the most simple and cost effective microprocessor to come along, and probably the first which will break into the amateur market in a significant way.

As we have all heard by now, microprocessors are "binary computers on a chip" which can be used to replace almost any array of hard-wired logic gates and flip-flops if an appropriate programme is written and stored in a ROM (Read Only Memory). These devices really are powerful, and can be used to build sophisticated control systems and a host of others. "Micro-madness" is currently gripping the professional electronic industry and microprocessors from various manufacturers are being used for just about every job which used to be done with a board full of TTL or CMOS logic.

You may be wondering why, if they are so wonderful, we haven't seen more of them in the amateur magazines, and the answer is that they have been, up to now, rather complicated things to use, requiring substantial peripheral components during the programme development phase of a project. The new National SC/MP is an attempt to minimise this initial complexity, and to make using a microprocessor a possibility for everyone, even amateurs.

The SC/MP instruction set is easy to learn and consists of only 46 instructions which are, nevertheless, very powerful and able to cope with a variety of memory and input/output situations. A separate clock generator circuit is not necessary, all you need is a single capacitor or perhaps a crystal, and you are in business. SC/MP also uses the tried and trusted P.M.O.S. technology and has a versatile 8-bit word length, both features which make for easy application.

To bring home the simplicity of the new chip, National sell an "Intro-kit" which consists of an SC/MP

chip, a PROM containing a programme called Kitbug, a few peripheral chips and a small printed circuit board, which can be quickly hooked up and then used to develop programmes with the aid of just a power supply and a teletype.

The teletype is, of course, a king-sized snag if you don't happen to have one kicking around in the workshop, but don't despair! National have also produced a companion to Introkit called "Telekit" which uses a cheap calculator keyboard and display as a teletype replacement!

The SC/MP and the kits are available from National distributors.

ALL BRITISH

Not long ago the analogue of logic circuitry to make a $3\frac{1}{2}$ digit, digital voltmeter, would have occupied a couple of shoe boxes and would have cost the earth. Thanks to MOS l.s.i. technology and the ingenuity of the all British semiconductor firm, Integrated Photomatrix Ltd., you can now buy the whole shooting match in a 28-pin DIP package for just a few pounds.

The I.P.L. MC904 is a complete $3\frac{1}{2}$ digit, dual ramp, autopolarity,

analogue to digital converter with basic voltage ranges of $\pm 200\text{mV}$ or $\pm 2\text{V}$, depending on the value of a single external resistor. The chip contains the integration and comparison amplifiers as well as all the control and counting logic, and even has "range up" and "range down" outputs so that an autoranging meter can be designed with the minimum of external components.

A wide variety of display devices can be interfaced with the MC904, including the simple and inexpensive 7-segment l.e.d. types, a combination which will be cheap enough and small enough to compete directly with moving coil meters of the traditional variety. Possible applications are varied and include comprehensive digital multimeters using the new chip as the measuring system, and requiring only the addition of suitable range switching circuits to convert a.c. and d.c. amps and volts, or resistance, into an equivalent d.c. voltage to drive the MC904 and display.

Power requirements are modest at plus and minus 14V and this new chip is likely to find its way into many amateur projects in the near future.

The MC904 is available from: Integrated Photomatrix Ltd., The Grove Trading Estate, Dorchester, Dorset.

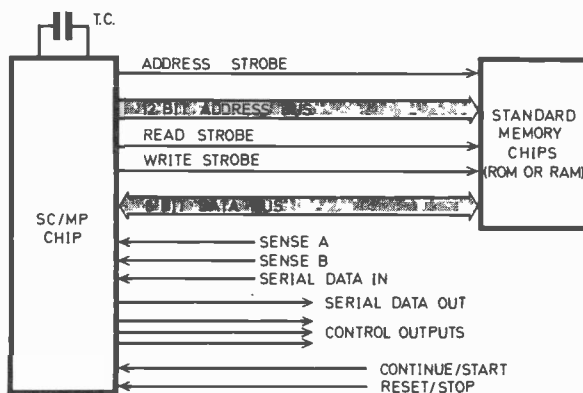


Fig. 1. A basic SC/MP system using the minimum of components and suitable for TV games and simple automatic control systems