newsletter 16

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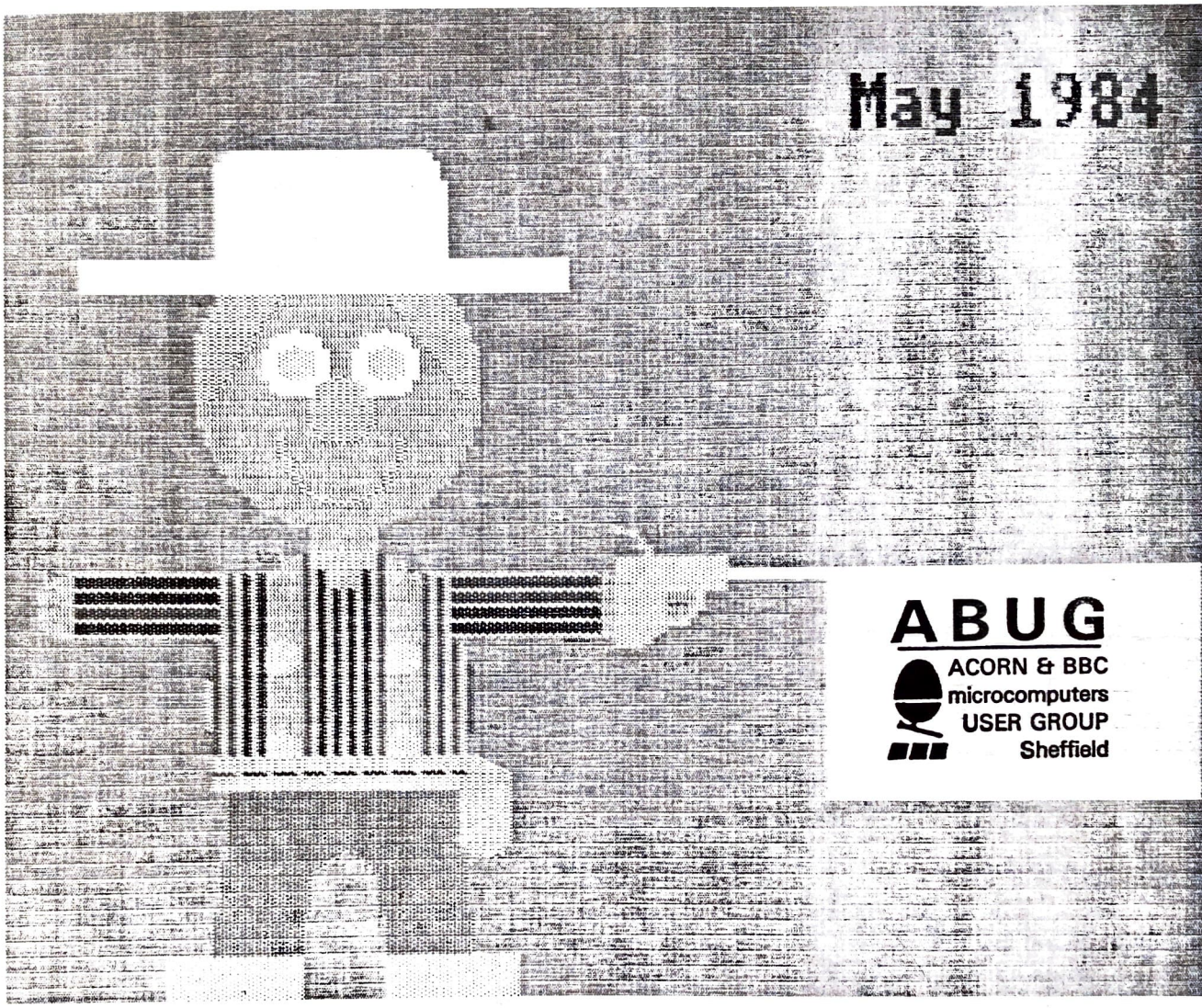

ABUG
ACORN & BBC
microcomputers
USER GROUP
Sheffield

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Diary

June 6th	(Farfields)	Social
June 20th	(Park Baths)	A talk on Communications by Peter Armstrong (University of Sheffield).
July 4th	(Farfields)	Social
July 18th	(Park Baths)	
August 1st	(Farfields)	Social
August 15th	(Park Baths)	

Several ideas for meeting activities are being progressd at the moment, but firm dates have not yet been arranged. Included in these are items such as talks and/or demonstrations on tape/disc transfer, robotics, computer control of machine tools, technical forums and various workshops. If you feel you could assist in the preparation and organising of these events then please contact any committee member.

We apologise for the late change of venue for the last meeting, but we thought that the opportunity for the demonstration was too good to miss. We thank Chris Ball and his colleagues for an interesting evening which gave many people the first opportunity to see a robot arm in the 'flesh'.
It seems that robotics and interfacing will become one of the major applications of the microcomputer for the hobbyist. The relatively low costs of sensors and motors could well extend the use of construction kits such as LEGO. We would like to carry some articles on this subject and we welcome any contributions from 'enthusiasts' in the club.

If members have any doubts concerning venue or activity, remember that a poster is always placed in DAIRON MICRO's windows giving upto date details of the following meeting.

Unfortunately, the Park Baths are being closed soon for refurbishing and so we shall have to look for a new 'permanent home' for monthly meetings. We had in any case been looking for slightly larger premises, and if anyone has any suggestions then please let us know.

For this month's front page we again had to rely on Chris Bramwell. Please let's have some other contributions:- DON'T BE SHY!

Beebug Cassettes

The club has taken out a subscription for the cassettes of programs which are available as supplements to Beebug magazine. As many members do subcribe to Beebug, we felt that this would would be a useful facility. These programs are freely available for people to type in, and members who also subscribe to Beebug will be able to transfer the programs to cassettes, for their own use, without breaching any copyright regulations. This would not be the case if any direct financial profit were being made from the transaction, and the library will not be charging for this service.
The area of copyright is still somewhat ill-defined legally, but we can expect software houses to force the issue with test cases soon. We remind people of our editorial comments a few months ago that the club meetings should not be used to make 'illegal' copies of commercial software. If members are not willing to co-operate in this matter then it is possible that outside pressure will be brought to bear on the club to limit facilities on club nights. It would be much better to restrict club activities voluntarily to avoid any potential confrontation with commercial concerns. Remember that several shops give a discount to club members, and other companies do come along to give talks and/or demonstrations. It would be foolish jeopardise this relationship.

We note that as predicted several months ago, Beebug magazine is now available (as individual copies) from W.H. Smiths, and so people can sample it before committing themselves to a whole year's subscription.

Adding RAM to the BEEB

Over the last year we have run several articles on various ways of adding memory capacity to the Beeb and the majority of people seem to have taken advantage of at least one of these methods. As we have now accumulated considerable experience in this area we thought it would be worth reviewing the current situation, both to bring everyone up to date and to serve as an introduction to anyone who hasn't yet taken this route.

The main problem to be overcome is that the microprocessor used in the Beeb can only directly access 64K of memory. If extra memory is required then it can only be at the expense of temporarily losing access to some of the existing memory. The most common method of achieving this is by using the sideways ROM facility. The hardware for implementing this is built into the BBC and three spare sockets are included on the main circuit board. When ROM is accessed from one of these sockets then Basic is temporarily lost.

The first memory expansion add-ons to become available were ROM expansion boards which increase the number of sockets to 16. Several different versions were produced but most have been withdrawn and now there are only two on the market, those from Watford Electronics and ATPL. The ATPL board is possibly of sturdier construction, sits more securely on the main circuit board and requires no soldering to fit but in practice has proved to be somewhat unreliable. This seems to be mainly due to a poor standard of electrical fabrication and use of large pins for plugging into the sockets. Once working they seem to perform very well. Problems seem to have been more common on the issue 3 computer boards. The Watford board is only attached at one point and tends to flap around alarmingly, requires soldering direct to one of the cheaper chips (not for the squeamish) but has given less installation problems. Both of these boards give considerable problems with overheating in the warm weather and certainly neither could take 16 EPROMS for any length of time.

The ability to hold RAM instead of ROM is also common to both boards and both now have a facility for battery back-up of static RAM. This enables CMOS RAM to be used in one of the sockets, which can retain its memory when the machine is switched off, giving a wide range of applications (long machine code programs, resident and updateable databases, real-time diary etc.). Unfortunately CMOS RAM chips are still very expensive (around £100 for 16K), spoiling what would otherwise be the ideal option to choose.

The next device to appear was the Solidisk sideways RAM board. This applies the same principle as the ROM board, using the memory usually occupied by Basic, but utilises the much cheaper dynamic RAM on a board with its own refresh signal. These have also given some teething problems mostly associated with poor soldering. They are well supported by good software and once working are good value for money. ROM-based software can still be used from these boards by loading the program into the sideways RAM from disc (or cassette). The 32K (two ROM sockets worth) version is the most popular with club members but there is also a 128K version which can hold up to 8 ROM programs. Alternatively it can be configured to act as an additional disc drive (drive 4 - with very fast access) or as RAM area to hold very long data files for word processing or screen manipulation for instance.

The Aries-B20 board provides another approach to the problem. This has an extra 20K of

dynamic RAM which is switchable into the address &3000-&7FFF, normally occupied by the screen memory for modes 0,1 and 2. This enables programs of up to 28K in any mode but provides little improvement for mode 7 programs. This seems to be a very expensive option unless you habitually write long high resolution programs, or until commercial programs become available which take advantage of these opportunities. There is an article in Electronics and Computing which gives detailed instructions for making a D.I.Y. board very similar to the B-20 at a small fraction of the cost.

The latest way of expanding memory is by obtaining one of the second processors which we discussed in March. As we said then, although the second processors are an interesting addition to the BBC they are a very expensive way of increasing memory, and should only be considered if you require some of the other facilities that they provide.

MICROWARE DDFS

This review covers the double density disk filing system offered by Microware. The Acorn system uses the 8271 disk controller chip while the Microware system uses the 8272. This chip is controlled by the CPU and looks after data transfer, head positioning and motor start up. The single density Acorn interface writes in FM and requires a synch bit between every data bit. Microware use an MFM controller to encode the data using a Phase Locked Loop process and does not require the synch pulse. This has the effect of doubling the storage capacity of the disk.

The upgrade is easy to carry out, and the kit contains all the necessary chips for the interface. The disk controller chip comes on a PCB with some circuitry to to make it pin compatible with the 8271 socket on the board. A comprehensive manual is also provided with the kit and gives detailed instructions for fitting. Some soldering will be necssary on boards of issue 3 vintage and earlier. This involves cutting a PCB track and soldering in a wire link, but it is not difficult for anyone familiar with a soldering iron.

After a reasonable trial period no problems have been encountered with the system. A formatter program is provided on the DFS ROM and enables the user to format 40 or 80 track disks as either single or double density. The DFS is able to detect whether single or double density disks are being used, so the user doesn't have to bother about this. Microware use similar commands to Acorn and as far as can be determined the two systems are compatible. The Acorn DFS will accept Microware formatted disks and programs saved on the Acorn DFS may be read by the Microware DFS. However, Acorn programs using the 8271 for protection cannot be read. The only bad point is the number of files:- the system only allows for 32 files per disk surface. Microware say they are due to release a new DFS that will allow up to 128 files, and which will read protected Acorn disks. There has also been a report that a new version will contain its own RAM.

At the price of £107 for the present system this is considered to be good value for a double density DFS. If extra disk space is needed it is certainly a better prospect than the Acorn DFS, particularly when the new version comes out.

John Fryer

Help wanted

Has anyone got a machine code routine to read a two byte number (hex) from memory, and convert it to a string of ASCII codes and then display the number on the screen as a decimal value? Please contact John Bramwell if you can oblige.
If other people have any programming problems or can offer any good program routines, then please let the editors know.