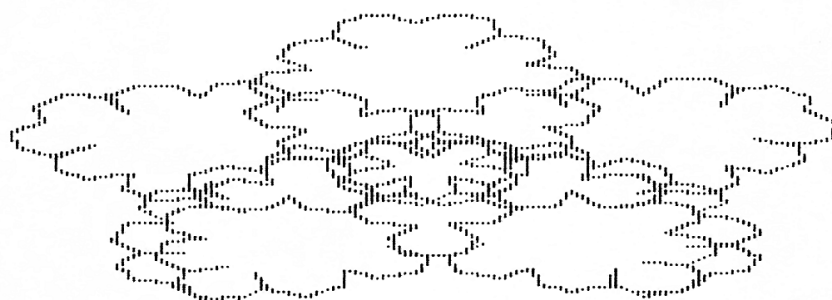THE
MEMOTECH OWNERS CLUB
MAGAZINE

FEATURES:-

VDP - MEMORY MAPPED

LISSAJOUX PATTERNS

NEWORD REVIEWED

INTERFACING PROJECT !!

EDITORIAL

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Quite a bit has been happening over christmas, the worst of which is that paper costs went up 40-50% on January the first, we managed to get hold of enough paper to last us to the end of the magazines first year providing we have not under speculated we should be O.K.

Januarys P.C.W. has a program that acts like an OLD command in it and also for those who are interested in music reviews, there is an article reviewing three programs, all of which would put Music Pad to shame.

If anyone is interested in software swopping we will put your swop in our letters pages so that other members can get in touch. Also on the point of getting in touch, if anyone would like their address and/or telephone no. published with any letters please say so on your letter.

Over the christmas I've been working on two utilities using the USER command, they work perfectly on my MTX 512, but I would like to make sure that they work on a MTX 500, if anyone with a 500 and some knowledge of Assembler/Panel has some spare time and wouldn't mind trying it out for me, please let me know, TA!. Phil

The winner of this months prize of Music Pad is Mr M. Fidler of Blackfield, Southampton. It just happens that he was our only entry, just goes to prove a small amount of effort can pay handsome dividends. P.S. This competition is carried over for a further month, so a little more effort please. Oh!, hopefully there will be a draw for a dust cover.

Our Hotline number is still (042121) 5489, why not give us a ring on Monday evenings between 6 & 7pm.

Sorry still no firm news about the new and forthcoming 100K & 250K disc drives, or for that matter new software, we just couldn't get anything out of Memotech over christmas.

It should be noted that all articles that are published are the copyright of the sender and M.O.C.. Please feel free to ask us for permission for publication elsewhere.

I think that we've just time for a little January Sale.
This month only:-   DMX 80 Printer £250 (incl. con. ribbon)
        All   Neword Rom £70.00
        Items   Pascal Rom £55.00
        Fully   Spare printer cartridges £10.50
        Inclusive   Dungeon Adv. £8.45   Maxima ££5.99

LISSAJOUX
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Lissajoux Patterns:-

If you have ever gazed at an oscilloscope being mastered by a physics genius, wondering how he manages to produce wonderful patterns, or even if you have never set foot in a physics laboratory, but have always wanted to produce pretty pictures, then these pictures are for you.

An oscilloscope is based on two pairs of electric plates, one vertical pair, the X plates, and the other pair horizontal, the Y plates (believe it or not!). A stream of electrons pass between these plates and are deflected by differing intensities of electric field put on the plates by an electric current. It is the constant changing of this electric current which developes the pattern or trace on the screen.

The Lissajoux patterns program shows how variations or 'frequency' of the X and Y plates would be shown on the oscilloscope's screen. Successive variations are drawn and if any look rather dull, or begin to re-occur, press the space bar and the computer will obligingly provide the next pattern.

Lissajoux Figures:-

The Lissajoux figures program is based on a similar principle to the patterns, but forms straight lines out of the curves. It is a program arrived at through experimentation more than anything. There is a random element thrown in too, and the user is required to enter the seed at the start of the program.

The space bar can be pressed to try another pattern.

Ball of Wool:-

Ball of Wool draws just that. The technique is quite simple, the computer is simply programmed to draw a series of Lissajoux patterns with a progressively changing scale.

With all three of these programs, a table of colour numbers is given on page 18 of the manual for you to refer to.

The programs follow on the next page and are very short, the algorithms which calculate the points on the picture are simple variations of a theme using only Sine and Cosine commands.

Many thanks again to Mark Cytera for this article, next months magazine will include Marks second article which draws a rather impressive picture on the screen and also developes some SOUND commands into a well known song.

*** LISSAJOUX PATTERNS ***

```
0 REM LISAPAT
10 INPUT "FOREGROUND COLOUR: ";PEN
20 IF PEN<0 OR PEN>15 THEN GOTO 10
30 INPUT "BACKGROUND COLOUR: ";PAP
40 IF PAP<0 OR PAP>15 THEN GOTO 30
50 VS 4: PAPER PAP: CLS: INK PEN
60 FOR F=0 TO 4 STEP .2
70 LET A=0: LET B=0
80 REM REPEAT
90 LET A=A+0.1
100 LINE 120*SIN(A)+127,95*COS(A*F)+96,
120*SIN(B)+127,95*COS(B*F)+96
110 LET B=A
120 IF INKEY$<>" " THEN GOTO 80
130 CLS
140 NEXT
150 STOP
```

LINE NUMBERS

```
;10-40   ENTER COLOURS
;50      SET-UP SCREEN
;60-70   VARY FREQUENCY &
;        RESET VARIABLES
;80-110  DRAWING LOOP
;120     SPACE BAR?
;130-    NEXT PICTURE
```

*** LISSAJOUX FIGURES ***

```
0 REM LISAFIG BY MARK CYTERA
10 INPUT "FOREGROUND COLOUR: ";PEN
20 IF PEN<0 OR PEN>15 THEN GOTO 10
30 INPUT "BACKGROUND COLOUR: ";PAP
40 IF PAP<0 OR PAP>15 THEN GOTO 30
50 INPUT "RANDOM NUMBER SEED: ";RNS
60 RAND RNS
70 VS 4: PAPER PAP: CLS: INK PEN
80 LET A=0: LET B=INT(RND*5)+1: LET C=INT(RND*5)+1
90 LET A=A+PI/30
100 LET X=95*COS(A)
110 LINE 128+X,96+X,95*COS(A/B)+128,95*SIN(A/C)+96
120 IF INKEY$<>" " THEN GOTO 90 ELSE RUN
```

LINE NUMBERS

```
;10-20   ENTER COLOURS
;50-60   SET RAND SEED
;70      SET-UP SCREEN
;80      SET VARIABLES
;90-120  DRAWING LOOP
;120     SPACE BAR?
```

*** BALL OF WOOL ***

```
0 REM WOOLBALL BY MARK CYTERA
10 INPUT "FOREGROUND COLOUR: ";PEN
20 IF PEN<0 OR PEN>15 THEN GOTO 10
30 INPUT "BACKGROUND COLOUR: ";PAP
40 IF PAP<0 OR PAP>15 THEN GOTO 30
50 VS 4: PAPER PAP: CLS: INK PEN
60 LET S=95
70 LET X=0: LET Y=0
80 FOR A=0 TO 125.7 STEP .1
90 LINE S*SIN(A)+128,S*COS(A)*SIN(A*0.95)+96,
   X+128,Y+96
100 LET X=S*SIN(A): LET Y=S*COS(A)*SIN(A*0.95)
110 NEXT
120 GOTO 120
```

LINE NUMBERS

```
;10-40   ENTER COLOURS
;50      SET-UP SCREEN
;60-70   INITIALIZE VARS.
;80-110  DRAWING LOOP
120      MAINTAIN SCREEN
```

Assembler Programming

Any machine code enthusiast who has tried to understand the operation of the TMS9918 Video Processor and it's associated 16K video ram from the description written in the MTX Users Manual may appreciate how confused I felt after reading it for the first time. This article attempts to provide a clearer and more practical approach to using and understanding the processor and it's VRAM.

Memory Map

The VRAM memory is mapped by BASIC as shown below, this 'map' is for both text and graphics. Graphics Mode 2 as the manual says!

Address in
 Decimal

```
16255     ; End of Sprite Attribute table
  "
16128     ; Start of Sprite Attribute table
16127     ; End of Pattern Name Table
  "          (Graphics Display)
15360     ; Start of Pattern Name Table
15359     ; End of Sprite Generator Table
  "
14336     ; Start of Sprite Generator Table
14335     ; End of Pattern Colour Table
  "
 8192     ; Start of Pattern Colour Table
 8191     ; End of Text Name Table
  "          (Text Display)
 7168     ; Start of Text Name Table
 7167     ; End Text Pattern Library
  "
 6144     ; Start Text Pattern Library
 6143     ; End of Pattern Generator Table
  "
    0     ; Start of Pattern Generator Table
```

Table Showing How VRAM is Mapped By Basic

Your'e probably still saying what does it all mean, well, starting with text mode (6144 to 8191), this 2K block of memory takes care of text mode. In text mode the screen measures 40*24 characters, that's 960 characters in all, starting at 7168 which represents the top left hand corner of the text screen, each screen location corresponds to a memory location, hence the Text Name Table is 1K long. Held in these memory locations is the ASCII number of the actual character, ie. if the 10th location along from the top (7178) contained number 31 then the screen location 10 across from the top would show a "1".(For a table of ASCII characters see your manual page 174, Appendix 1). Incidentally the 128 ASCII characters are stored in the Text Pattern Library, each entry in the library takes 8 bytes,

therefore, the library is 1K long. Notice also that the ASCII characters are stored in the order of the table in your manual and so placing a 31 in a display location causes the processor to look a the 31st entry in the Text library and print that pattern to the screen.

The graphic's display is laid out in a similar way to that of the text display except more memory is needed and there is more attention paid to detail.

In graphics mode (mode 2 in the manual) the screen is divided into three sections each of which has 256 pattern positions, each pattern position is capable of displaying it's own unique graphic character as defined by the programmer. Each pattern is made up in a 8 bit by 8 byte grid the same as for sprites.

To make things a little clearer let us look how patterns are positioned on the top 1/3 of the screen. Firstly the patterns are defined on the 8 * 8 grid and then are entered in their hex format into the Pattern Generator Table starting at OK. Thus if patterns x,y and z are defined then they will occupy a total of 24 bytes from £00 to £18.

The choice of pattern and it's position on screen is determined by the contents of the associated Pattern Name Table, which in this case starts at 15360 Dec and is 768 (24*32) bytes long. As you can see this is much the same as for the Text Screen. It should be pointed out however that patterns defined for one 1/3 of the screen may not be used for another area of the screen unless they are defined in the associated Pattern Table.

Ink and Paper colours for the defined patterns are set by the contents of the 3 1/3rd's of the Pattern Colour Tables, again one table for each 1/3 of the screen. Each byte in the colour table is directly related to the byte entries in the pattern table. Ink colour is determined by the contents of the most significant half of each byte and Paper colour by the contents of the least significant half. It follows therefore, that each byte of a pattern definition may have it's own ink and paper colours.

Next month I'll explain how the sprite generator table and the sprite attribute table are set up by basic and then move on to explain how the VDP's registers are set up by Basic.

Many thanks to Paddy Thompson for the help that he has provided in the writing of this article!!!

SOFTWARE REVIEWS

CHARMKATZ

		RATING SYSTEM	
Publisher	Solway Software 13 Hensingham Rd	Excellent	=5
	Hensingham, Whitehaven,	Average	=3
	Cumbria. CA28 8PS.	Poor	=1
Price	£3.50 to M.O.C. members (RRP £4.00)		
Outlets	Above Address		

This is the first of two games produced by Solway, it is an arcade style game with an infinite number of levels. Large scores are only possible if you can keep your 'charm rating' at a sensible level by eating the charmed mushrooms scattered through the forest. At higher levels there is a lunch box which you can take if you are in trouble.

CHARMKATZ can be played using a joystick or the keyboard, it also has a "hold" facility if you need to take a breather.

Conclusion
Although written in Basic, this game is very fast and a real challenge to achieve a good score

Playability	=4	Graphics	=3 to 4
VFM	=5	Lasting Int	=3

~~~~~~~~~~~   PHIL

TUMBLEDOWN TOWER

As Above.....

Some adventure games that I have tried have been very difficult, really for the connoisseur, this one however although proving a great challenge was more at my level, it is about as difficult as Alice In Wonderland and has some imaginative clues which you must not ponder on for to long as being real time adventure you could end up in trouble.

Conclusion
Again this is a basic program, having 64 locations some of which are very strange indeed and numerous objects to pick up, this adventure is a real value for money game at it's RRP of £4.50, at the discount offered to M.O.C members the price of £3.50 is excellent value for money.

Playability	=3 to 4	Graphics	N/A
VFM	=4 to 5	Lasting Interest	=4

~~~~~~~~~   PHIL

News Flash

We have just received news of a new software company called 'MEGASTAR', this company was set-up by Memotech and is to be based in Cheltenham. They intend to initially release 5-10 titles in mid-February. Hopefully we will have found out some more by the next magazine which is due out the first week in March.

YOUR LETTERS

Mark Cytera has had an idea for the magazine:- Why don't we have a high scores table for the games!. Members could write in and say what they have got on their games, mine are:-

```
TOADO       20,000
BLOBBO      13,025
KILOPEDE     7,341
NEMO         3,600
CONT RAID    3,580
MISS ALPH   18,430
```

Programming Query from Alun Roach
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

I have a query concerning the GRAPHIC screen (VS 4). This displays the full 32 character/row, but character 0 on each row (column 0) is off to the left of my display. Column 31 (right hand column) is at the right of my display and adjusting the set to bring column 0 into view only results in losing column 31 off the right hand side. I can still use column 0, it's just that I can't see it. Can anyone tell me how I can squeeze the screen a bit to get them all in view at the same time?.

P. Crighton of Kent has an answer to Arthur Wingroves query about the Cassette Baud rate from issue 3:-
To change the cassette baud rate it is necessary to alter the system variables CASBAUD and MIDVAL, for both saving and loading.

CASBAUD=FD5F (HEX) = 64863 (DEC)
MIDVAL=FD60 (HEX) = 64864 (DEC)

When CASBAUD is changed, MIDVAL should be changed according to the formula below:-

MIDVAL=256-(CASBAUD*1.25)

Decreasing CASBAUD will increase the baud rate. For example, if CASBAUD is changed to 30 HEX (48 DEC) then MIDVAL must be changed to C4 HEX (196 DEC). This increases the baud rate to 3600 Baud, decreasing the loading time.
N.B. CASBAUD should be a multiple of 4!

We have had several people asking if it is possible to produce an ON ERROR GOSUB, well how about trying to unravel this information from Neil Gooding!:-
One way to add extra commands to Basic is to intercept a jump to the Basic error printing routine, checking to see if the error was caused by an addition command, if not jumping into the error routine, else performing the new command and then returning control to basic.
When an error occurs the ROM jumps to the USERROR system variable (£FD54) which normally contains the code for JP £18AF.
It is possible to change this location so as to cause a jump to a user supplied routine. The Z80 register A contains the error code. If bit 5 of A is set then the error was caused during

execution of a program line and the memory address of the error is held in the system variables CONTAD (£FD6A)-the address and CONTPG (£FD6C)-page number. If the error occurs during direct entry the position of the error, if a syntax error, is held in ERRPOS (£FD84). The line will be held in the keyboard buffer, beginning at the address held in KBDBUF (£FA83). If in a program the user routine should end by jumping to £2CC1 with the DE register pointing to the start address of the next line to be executed. If in direct entry, the user routine should jump to £250 to regain the ready prompt. How to get the line inserted into Basic is unknown to me at the moment.

A useful ROM call for use in assembler programs is £3622 which stores the ASC of any key being pressed in LASTASC (£FD7D). It takes account of shift,alpha lock and control keys in retuning the result.

...and finally a question, can anyone explain to me how to use the RST 28 command properly . I have an idea of how it works but doubts still remain.

INTERFACING

As you probably know there is a user port inside the machine but a suitable connector (as described in August Electronics & Computing) is unobtainable. We have solved this problem with our own connector design. This connector which is very simple to fit, brings the port outside the machine for use by way of a standard IDC socket. The price of this connector is £4.50 incl.(with fitting instructions).

To support this connector we intend to produce a series of simple circuits for you to build. The first of which is a programmable L.E.D Display.

We are able to supply a full set of parts required for the project including all building instructions, circuit diagrams and software listings for the complete beginner at a cost of £6.95 fully inclusive.

If you order both items at the same time then please deduct 50p from the price of the cable.

Please make all cheques payable to the M.O.C..

Phil,...thanks for the terrific response the this interfacing project, I'm sure you all will have many hours of enjoyment building and programming you project. I personally find great satisfaction when an experiment eventually works (usually after several 'duff' attempts), you hopefully will have the benefit of errors in that these faults have been ironed out.

As a matter of interest I've recently managed to interface the Z80 PIO onto the edge connector at the side of the machine.

HARDWARE REVIEW

Title: Neword (Rom)   Type: Word Processor
Supplier: Memotech   Price: £75.00
            M.O.C price this month only £70.00

Neword is a ROM based wordprocessor program clearly derived from
the standard, and immensely popular, Wordstar program. It is for
use in any of the Memotech range, including RS128, which uses
cassette storage. A disc based version is supplied to purchasers
of the disc systems.

Neword is supplied in ROM on an expansion board which is fitted
inside the machine case. It comes complete with an Allen key for
removing the case ends to gain access to the internals, and with
a reasonably comprehensive 40 page manual (Still marked
'Provisional'). The installation instructions are brief but
sufficient, and once the case is opened the board, with fitted
edge connector slips neatly on to the main processor board. This
still leaves room for one further expansion board (Rom,Ram or
RS232). It took less than 5 minutes to fit the board, and no
difficulties were encountered.

Once the case was re-assembled, the machine was switched on, and
Neword entered by typing ROM 2<RET>. Being Rom based the control
of the computer was transferred instantly to Neword and the
copyright notice, rapidly this was replaced by the opening menu.

The program is menu based, and at all times the list of available
options are displayed on the screen. This makes the program easy
to learn and use, without having to memorize numerous control
codes. There is also a help facility which can be called up at
any time to explain the operation of a particular instruction.

The opening menu allows the user to choose to get a document from
tape to be edited, or to begin a new document. The instructions
are clearly displayed on the screen, and explained in the manual,
so it is very easy to begin work on the system. There is some
restriction on the format of document titles, but these are
minimal and do help to encourage sensible labelling of documents
for storage and retrieval.

For all screen activities Neword has a default page size of 65
columns by 55 lines, with the screen acting as a window on this
large area. It is possible, by adjusting the right margin, to
select any page width from 1 to 255 columns. Pages can be of any
desired length. Typing onto the moving screen can be a little
disconcerting, but defining a page width of 38 columns ensures
that all typing falls within the normal screen area. This can
later be re-formatted for printing at the required page size.

There is a keyboard buffer, so quite fast typing speeds are
attainable, and there are few problems with keyboard bounce. The
editing functions are called up using the standard Wordstar
convention, that is the CTRL key and one other to achieve the

9

specified function. For example CTRL and A pressed together will move the curser one word left. Some of the more common functions, for example the normal curser controls, are also configured to use the appropriate keys on the Memotech, including all the function keys. To get a real appreciation of how Wordstar works and hence Neword, I would recommend a visit to your library or bookshop who will almost certainly have books on this.

Editing a document is quite straightforward with comprehensive erase and insertion facilities, as well as a full find and replace function. Editing is achieved by erasing the error and inserting the amendment — overtyping is not possible. Some care needs to be exercised with this when major changes are being made, but I have experienced no particular difficulty. It is important, however, that paragraphs should be re-aligned after each such process (Using CTRL-B). The program also allows full print formating including **BOLD** and <u>UNDERLINED</u>, which will show on screen as ^BBOLD^B and ^SUNDERLINED^S. Line centering and justify are also available, though this does not use proportional spacing. It is possible to review on screen the format of the final printed document.

There are some limitations in the program which have caused only minor inconveniences. There is no provision for block moves of text, though to a certain extent the ability to merge documents can overcome this. It is not possible to rename a document in memory, for example to update the title of a modified document. The most limiting in my application has been the inability to incorporate other escape codes in the document to take advantage of printer facilities such as enlarged, or condensed text, subscript and superscripts and other printer control functions.

Printing documents is extremely simple, and saving to tape has proved to be suprisingly fast and trouble free using standard audio recorders. With the MTX512, documents of 8 to 10 pages can be processed without problems, there is an on screen indicator to show how much memory remains. The program will support any printer which accepts standard ASCII and escape codes, and with either Centronics or RS232 interfaces.

Conclusion
Neword is a comprehensive word processor program with many of the features of it's disc based big brothers. Using the same format as Wordstar means that many will be familiar with it's operation, and though this has come under some critisism I have found it easy to learn and use to good effect. The documentation wins no prizes for artistic merit, but does contain all the necessary information to enable full use of the program. The addition of Neword to my MTX gives me a professional quality processor system for around £600, which has been fully utilised. Though £75 may seem a lot for the average home user, I feel it represents excellent value in it's impact on the utility of the MTX system.

—ooooo——— Many Thanks To Ray Morrissey ———ooooo—