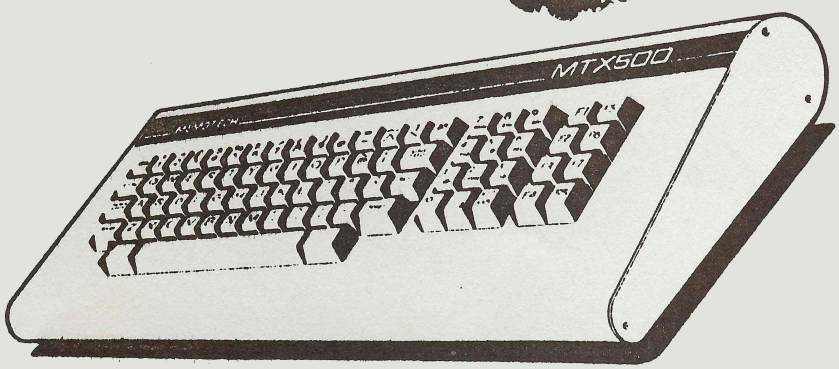
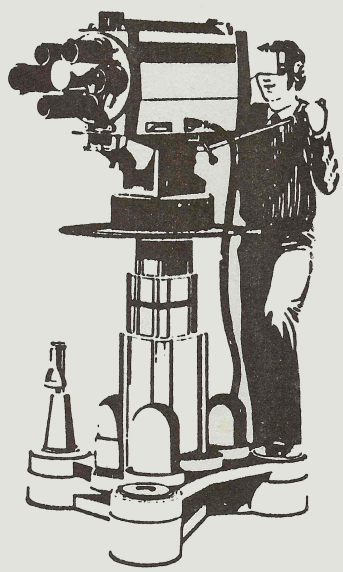
VOL 0010
NUMBER 3

memopad

Memotech Computer User Club Magazine

Contents





£1.25

MEMOPAD IS PUBLISHED BY SYNTAXsoft FOR THE MEMOTECH USER GROUP
UNIT 109,GLENFIELD PARK, GLENFIELD ROAD, NELSON BB9 8AR
TELEPHONE: 0282 698849

COVER PRICE £1.25.

AVAILABLE BY SUBSCRIPTION ONLY.

Editorial

By the time you read this you should have seen the two Memotech advertisements in PCW & What Micro. Is this the turning point for the Company ? Are we going to see more adverts. Well, the answer to the second question is yes, but on a limited scale. The first question can not be answered until after the festive season has been and gone. However, if sales keep on par with the present level then I see no reason why Memotech cannot enjoy a mini-boom.

Thanks to all members who have participated in the voucher scheme, we have had lots of sales from the promotion. Also, MICROCOSM FEVER IS catching on fast. The sales for the first three weeks have been enormous. We be reserving space for MICROCOSM CLUE TRADING in the next edition. However, the member who rang 10 Downing Street to claim their prize was a little off centre !

As this goes into the post we shall have been to Holland for the Dutch Computer Show. Jeff Wakeford, from Memotech, will be coming along and we hope to promote Black Beauty with all the latest software.

It is hoped that we will be successful in sending out the December edition in time for you to have some Christmas reading, and part of the magazine is now finished.

The SPECULATOR is selling so well that we still have not enough stocks to deliver as ordered, but we will continue with a first come, first served basis until stocks have built up. In the next edition we will carry a full review.

On a more personal note, this is the last edition that I will have the pleasure of editing. From this month Tim Marstian will be taking over as the editor of Memopad. I shall still be here, and I shall still have the final say as to what goes into the mag, but due to my personal commitments I find that unless a thirty six hour day is devised I have no chance of completing my daily work load.

One final point. Saturday is open day and from 10.30am till 3.00pm anyone is welcome to personally call at Syntaxsoft.

Many thanks for your support ..... keep on tapping ... we need programs and articles for Memopad. Look forward to seeing your submissions.

Kh

SUBSCRIPTIONS

IF YOUR MEMBERSHIP NUMBER IS BEETWEEN 0 - 1119 INCLUSIVE YOU ARE NOW DUE TO RENEW YOUR SUBSCRIPTION. TO MAKE SURE OF RECEIVING YOUR NEXT COPY OF MEMOPAD PLEASE SEND YOUR RENEWAL SUBSCRIPTION TO REACH US NO LATER THAN THE 20TH DECEMBER.

GENPAT HIT LIST....

arcade

1.	SEPULCRI SCELERATI	MEGASTAR
2.	USER BASIC	SYNTAXsoft
3.	DRIVE THE CEE-5	MEGASTAR
4.	QUAZZIA	MEGASTAR
5.	MEMOSKETCH	SYNTAXsoft
6.	QOGO2	MEGASTAR
7.	QUANTUM	SYNTAXsoft
8.	FELIX IN THE FACTORY	MICROPOWER
9.	EDASM	SYNTAXsoft
10.	DOWNSTREAM DANGER	MEGASTAR

adventure

1.	SNOWBALL	LEVEL 9
2.	LORDS OF TIME	LEVEL 9
3.	THE KEYS TO TIME	SENTIENT
4.	ADVENTURE QUEST	LEVEL 9
5.	EMERALD ISLE	LEVEL 9

educational

1.	SPELLICOPTER	SENTIENT
2.	FIRST WORDS	CONTINENTAL
3	MATHS 1	CONTINENTAL

High Scores

Can you do better ?

GOLDMINE	16,300+	P. Howard
ASTRO-PAC	185,990	Richard Nash
BOUNCING BILL	128,142	Alan Dobson
SNAPPO	128,688	Richard Franks
KNUCKLES	999,999+	Sally Street
CHAMBEROIDS	Completed 6 mins	M. Allcorn
NEMO	17,610	Richard Nash
COBRA	8,924	Richard Nash
MISSION ALPHATRON	68,250	T. Eriksson
TAPEWORM	175,980	Richard Frnaks
TOADO	178,292	Gavin Gaunt and Nicholas Locke
POT HOLE PETE	106,630	Richard Franks
MAXIMA	500,000	Virginia Parton (5 ships left)
STAR COMMAND	140,430	Ian Nichols
PHAID	26,000	Sally Street
OBLOIDS	62,400+	M. Hurley
KILOPEDE	82,253	Richard Nash
3D TACHYON FIGHTER	10,700	Lesa Woodger
CONTINENTAL RAIDERS	106,240	Sean Haverty
BLOBBO	148,283	Elizabeth Mahon
QUANTUM	6	M. Allcorn
QOGO 2	205,000	R. Siddall
MINEFIELD	1,500	David Nash
FLUMMOX	166,690	Andrew Miller
TURBO	15,630	N. Crighton
FATHOMS DEEP	2,300	Leslie Banks
AGROVATOR	675,000+	P. Howard
FIREHOUSE FREDDIE	29,620	T.Eriksson
QOGO	43,960	T. Eriksson
ARCADIANS	25,900	Adrian Joynson
MISSILE COMMAND	27,580	Adrian Joynson
LITTLE DEVILS	34,320	Leslie Banks
FELIX IN THE FACTORY	11,950	Richard Nash
HUNCHY	7,908	R.Harmer
SON OF PETE	8,051	Gavin Gaunt
HAWKWARS	16,600	T. Eriksson
ESCAPE FROM ZARCOS	46 Items	P+G Howard
SALTY SAM	40,642	Andrew Johnson
MISSION OMEGA	9,350	R.Harmer
ICEBURG	17,431	Alan Dobson
SNOWBALL	450	P. Crighton
EMERALD ISLE	300/1000	Richard Franks
SUPERBIKE	23.9Kms	B. Clark
REVERSI	beaten by 47	Richard Franks
DOODLEBUG	3,440	M. Allcorn
DR. FRANKIE	23,375	M. Hurley
TARGET ZONE	14,560	P. Howard
MINER DICK	22,520	R. Siddall
JUMPING JACK	12,000	Nic Joynson
SURFACE SCANNER	35,830	P. Howard
CAVES OF ORB	421/500	P. Korsten

SOFTWARE REVIEWS

KARATE KING
reviewed by
T. Marstian

MEGASTAR

With great anticipation, I loaded Karate King into my computer. There isn't a loading screen I'm afraid, although the program doesn't take long to load.

The aim of the game is to collect the lanterns whilst avoiding the enemy. If all the lanterns on a particular level are collected, a secret passage opens, allowing you through to another level. As you progress through the levels, the difficulty of the game increases.

The enemy takes the form of ninja who try to kill you by kicking and punching whenever possible. Control is quite easy with a joystick. Movements include:kicking, punching, running, climbing, ducking and jumping.

The graphics are perhaps a little small and jerky although the background graphics are quite good. Sound is reasonable, although it could have been improved. The marks for the program are as follows:-

GRAPHICS:	8
SOUND:	7
CONTROL:	8
ADDICTION:	9

A very enjoyable, addictive game suitable for the whole family.

SUPA CODER
reviewed by
Dr. Standiford

SYNTAXsoft

Supa Coder is an integer only Basic compiler used to convert Basic into machine code. The only limitations are that only one dimensional arrays are allowed, and of course, only integer values are allowed (with the exception of ANGLE).

The compiler occupies memory from address 47000 upwards. On the 512, compiled code is located at address 30000 onwards. Obviously, the compiler cannot handle massive programs, although I found it possible to compile individual sections of program with a little care.

To test the compiler, I typed in a FOR-NEXT loop requiring 34 seconds to run in normal Basic. I compiled the program and ran the code. Unbelievably, it only took 1 second!

The compiler will handle all of the following commands:-

ABS, ADJSPR, AND, ANGLE, ARC, ASC, ATTR, CHR$, CIRCLE, CLEAR, CLOCK, CLS, COLOUR, CRVS, CSR, CTLSPR, DATA, DIM, DRAW, DSI, ELSE, FOR, GENPAT, GOSUB, GOTO, GR$, IF-THEN, INK, INP, INPUT, INT, LEFT$, LEN, LET, LPRINT, MID$, MOD, MVSPR, NEW, NEXT, ON GOTO, ON GOSUB, OR, OUT, PAPER, PAUSE, PEEK, PHI, PLOD, PLOT, POKE, PRINT, RAND, READ, REM, RESTORE, RETURN, RIGHT$, RND, SAVE, SBUF, SGN, SOUND, SPK$, SPRITE, SQR, STOP, THEN, TIME$, TO, USR, VIEW, VS n

On the reverse of the tape is a small program that allows saving, loading and verifying of compiled code. This is useful, as the Basic source code is not saved with the code. This obviously speeds the loading and saving up considerably.

Overall, I think Supa Coder is a worthwhile addition to any Memotech User's software range.

THE WALL
reviewed by
T. Marstian

SYNTAXsoft

The Wall is one of the new releases from SYNTAXsoft. It is really a super-glorified version of the old favourite `Breakout'.

It is possible to play in practice mode allowing an infinite number of "lives". This is certainly a useful feature, as the game certainly reuires a great amount of skill! The reason for this being that the ball spins, causing it to shoot off at strange angles. The spinning is caused by hitting the ball while the bat is moving. The spinning effect is very realistic, and therefore adds greatly to the game.

There are lots of features to the game. These include:-

Two balls on the screen at once.
Birds that fly across the screen awarding extra points when hit.
Strange shaped objects that bounce the ball off apparently at random.

The title screen also shows other "nasties" that hinder your progres through the many levels. The marks for the program are as follows:-

GRAPHICS:	8
SOUND:	7
ADDICTION:	9
CONTROL:	8
VALUE:	9

This is an excellent, addictive game from SYNTAXsoft that is a must for all serious games players.

PAINTBOX
reviewed by
T. Marstian

SYNTAXsoft

Paintbox is a graphics utility program (not another!). The program has an adjustable speed control, so you may set the program to run at a speed to suit your needs.

The basic way of designing screens is by using a cursor that can leave a trail of dots as it moves. Extra facilities of the program include a good "fill" routine that copes with irregular shapes quite easily. Also, the program contains 10 different shades that can also be used to fill areas.

Pressing Y displays a colour chart that allows you to choose paper and ink colours. The M and N keys can be used to select different magnifications that are very useful for adding detail to the screen.

Included with the instructions is a small routine that will allow pictures to be saved and loaded on disc.

The program also has a text mode that can print normal text or user definable graphics onto the screen.

Overall, the program appears to have incorporated some very useful facilities from other graphics packages. For instance, the magnify function allows detailed designs to be created quite easily. Also, the fill and shade routines allow colouring of large blocks to be performed very easily. The shades available are varied, and should suit almost any application.

Paintbox is certainly a good utility that has been thought about very deeply when written.

CPM Using The Dynamic Debugger

DDT allows interactive testing and debugging of programs which have been generated in the CP/M environment. DDT can be initiated by typing one of the following commands:

```
DDT
DDT  Filename.Com
DDT  Filename.Hex
```

The DDT is loaded into main memory by occupying the memory space normally used by the Console Command Processor (CCP) which means that it loads directly below the Basic Disc Operating System (BDOS). The starting address of BDOS is automatically altered to take into consideration the fact that the Transient Program Area (TPA) is reduced in size by the installation of the DDT.

When a filename is specified the HEX or COM file is automatically loaded into the TPA after DDT has taken over control.

Once the SIGN-ON message has been displayed DDT prompts for further inputs by displaying the "-" character. You are now free to type in any of the commands available - they must be terminated by a `RET"

The standard CPM controls can be used, e.g.

```
CTRL  C  OR BRK   =  System reboot
CTRL  U           =  Delete entire line
```

If the command line reaches 32 characters (the maximum allowed) DDT automatically inserts a `RET" as the 33rd character).

TAKE NOTE .....

All numeric data is input to DDT and output by DDT in Hexidecimal format.

CTRL C will stop execution of DDT. This is very useful when performing a debugging run on a program in memory.

SAVING MEMORY IMAGES

SYNTAX:- SAVE b1 Filename.COM
Where b1 = the number of pages to be saved.

The pages are = 256 K blocks. The value of b1 can be calculated by taking the MSB (Most Significant Byte) of the highest address of the load address (displayed by DDT) and convert it to decimal.

e.g. If the highest address displayed is 189AH then b1 = 18H = 24 decimal
so, SAVE 24 TEST.COM would save the core image of the program in memory. This core image is saved as a core file on the disc and can (if fully debugged) be executed by typing TEST `RET".

If a bug is still discovered in the saved program it can be further debugged by typing

```
DDT  TEST.COM
```

THE COMMANDS

A - ASSEMBLE
FORM A sad (where sad = starting address)

DDT allows 'in line' assembly language to be inserted into the program currently in memory. The address of the next instruction is then displayed and DDT waits for assembly mnemonics (8080 format). Obviously, all memory references must be in absolute form and not labels. The assembly session is terminated by inputting a null line at the address prompt.

D - Display

FORM D
D sad
D sad,fin
Where sad is the starting address and Fin is the finish address.

D will start displaying from the current pointer address which is initially set at 100H.

D sad starts the display for the address specified in sad.

D sad, Fin will display from address specified in sad through to the address held in Fin. When using this mode the BS key will abort the listing.

```
0470 01 3A 7A 06 FE 4A C2 81 02 CD 45 01 F6 02 C3 8B .:z..J....E.....
0480 02 FE 43 C2 96 02 CD 45 01 F6 04 CD 51 01 79 CD ..C....E....Q.y.
0490 51 01 78 C3 51 01 FE 52 C2 18 05 CD 1D 01 F6 C0 Q.x.Q..R........
04A0 C3 51 01 2A 0E 00 D5 EB 2A 0C 00 7B 95 7A 9C D2 .Q.*....*..ç.z..
04B0 B7 02 2A 13 00 F9 C9 D1 7E 23 22 0C 00 C9 3C E6 ..*.....~#"...<.
04C0 07 FE 06 DA C8 02 C6 03 FE 05 DA CF 02 C6 02 C6 ................
04D0 41 4F C3 15 00 47 E6 F0 0F 0F 0F 0F C6 90 27 CE AO...G........'.
04E0 40 27 4F CD 15 00 78 E6 0F C6 90 27 CE 40 27 4F @'O...x....'.@'O
04F0 C3 15 00 06 04 4E CD 15 00 23 05 C2 F5 02 0E 20 .....N...#.....
0500 C3 15 00 7A E6 38 0F 0F 0F C9 CD 03 03 87 4F 21 ...z.8........O!
```

I - INPUT

FORM I FILENAME

This command allows you to insert a filename into the Default Control Block (DCB) - this is normally located at 5CH. By using this command any file can be loaded into DDT. e.g.

```
DDT   `RET"
I TOADO.BIN   `RET"
```

Toado can now be displayed from load by using the D command.

F = FILL

FORM F sad, Fin, X

Where sad is starting address
Fin = Finishing address
X = Hexidecimal byte used to fill memory area.

G = GO

FORM = G
G sad
G sad,BRKP
G sad,BRKP, BRKP2

G starts execution of the program from the current location specified in the Program Counter (PC) with no breakpoints set - regaining control of DDT is difficult using this mode. To find the value of the PC type X.

G sad (sad = starting address) performs in exactly the same manner as above but this time program execution starts from the address specified and the PC is made to point to this address.

G sad, BRKP also operates in a similar manner to the two commands above, but control is handed back when DDT reaches the breakpoint address specified in BRKP. Note that the PC points to the address used in BRKP.+1.

The final command operates exactly as above and control is handed back when either BRKP or BRKP2 are encountered. Note that the breakpoints are cleared after each run.

GO`RET" would be used to terminate a session with DDT.

L = LIST

FORM L
L sad
L sad, fin.
sad = start address Fin = finish address

These commands are used to list the current program in disassembled 8080 mnemonics and is similar to any other disassembler. Listings can be aborted by pressing the BS key.

M = MOVE

FORM Msad, Fin,Dest

sad = start Fin = finish Dest = destination address.

This allows you to move a block of code between sad & Fin to an address specified in dest.

R = READ

FORM R
R offset.

The Read command is used in tandem with the I command to read HEX and COM files from disc into memory. The advantage of this command is that it allows you to specify an offset to the addresses as they are loaded into memory.

S = SET

FORM Ssad

Using the S command allows the programmer to examine memory locations and subsequently alter items if desired.

Typing RET leaves memory unaltered

Typing an Hexidecimal byte value causes this value to be stored in memory overwriting the existing value.

The session is terminated by typing (.) (full stop) `RET"

T = TRACE

FORM T
T Hex

The Trace command allows for selective trace program execution.

Using the first form the next program step is executed (specified in the PC) and then the termination address is displayed.

Using the alternative form allows the trace to continue for Hex number of steps (1-65535). The CPU state is automatically displayed after each program step and the Trace can be terminated by typing (BS) `RET"

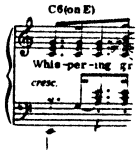
X = EXAMINE

FORM X
X REG
REG = CPU REGISTER.

X Reg allows the specified Register to be displayed and altered if so desired.

As you will realise the DDT is a very sophisticated form of Panel. ✶

Take A Note (any note) *Derick Brown*



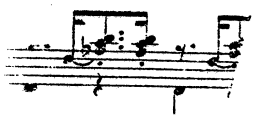
This month Derrick Brown completes his explanation of the way he programs the sound chip from Basic. The program that follows has a hellish amount of data statements ... so we will be supplying it on the next Tape of the Mag. I can assure you that the sound is worth listening to ...

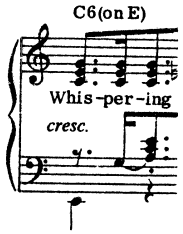
Under the generator enter lines assigning a value each for A,B,C and D (1 to 15) being the volume control per channel. The melody will need to be heard, so don't drown it with the bass! Assign a letter/value to control speed. This will vary as to the music so for starters try 150. I would strongly advise that before you type in the full instructions - have a check on the DATA - and make sure it is free of "bugs".
A skeleton listing will suffice. Enter FOR X=1 TO ....(count), GOSUB (line number where the READ line is placed) followed by NEXT X. Allow plenty of space and go down to say 480, enter READ V1,V2,V3,V4. Leave at least 2 lines, enter SOUND(channel), N(V1),A and 3 further entries but amend the channel number and volume letter. Enter a PAUSE (same letter assigned for speed) followed by RETURN. Leave about 10 lines space then enter DATA values from the sheets. WARNING: whilst you entered values reading across, for the DATA lines you must enter them by reading DOWNWARDS as the MTX has been instructed to read one number for each channel, in that order. When the last number has been entered you may type RUN. The long awaited moment has come!
If nothing else, first playing will soon show you where the "bugs" are.
The 2 vacant lines after the READ line can be used to hear one channel at a time by entering 67 against the V number(s) [channels] to be silenced. One day, quite by accident, I found by switching the order of channels I could get differing effects from the same music. At that time, my knowledge was insufficient to get the channels to switch over, so I called in the analyst for advice. I had to pay for the information but it was worth it! This is the reason for leaving some space prior to the DATA lines - you might like to experiment yourself. In the said space enter another set of READ/SOUND/PAUSE/RETURN lines as before but change the order of channels. To operate this set you must change the GOSUB (READ line number) to the position of the second READ line. After all my explanations perhaps a referencee to a listing so arranged would help. I have selected the chorus of the well-known tune Roll out the barrel - the first tune I transcribed for the MTX. It has been extracted from the original version which contained the verse, hence the "odd" line numbering. The "old" generator as mentioned in this article was used. For those who like experimenting,substitute the generator (based on a tempered scale of C) for lines 15 to 70 - no other alterations are required. Now you have 2 methods of playing the music - I wonder which you prefer?
A few comments on the chorus: bars are numbered with DATA line. In the first bar of introduction (695) the 3 little notes printed do not have any time value. I put them in an octave higher than written, one number for each, and assigned a speed of 1. In bars 705,710 etc., the time value for the small notes is taken of the first note in the bar as it is inclusive in the 4 beats. In bar 695 the D in the bass counts as 2 beats so is omitted from the following chord, this applies to the C and A in bar 700. Bar 865 is not as the music, it's one I put in for the run up to the finish. Last chord is marked for an octave higher but was beyond the range. You may amend this when using the 66 note generator, the numbers being 55,50,47 and 43.

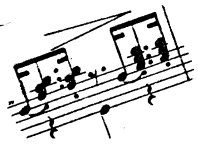
Should anyone have any questions or a particular tune they would like to hear on the MTX - my services are available c/o the Editor. I would like an s.a.e please.
I do have some more tips,maybe for another article....so for now let me wish you happy listening as I sign off with my signature (tune) - GENPAT 654

```
1 REM CHORUS OF ROLL OUT THE BARREL
10 DIM N(50)
15 LET N(1)=956
20 LET N(6)=N(1)*.75
25 LET TC1=(N(1)-N(6))/5
30 FOR X=1 TO 4
35 LET N(X+1)=N(1)-X*TC1
40 NEXT X
45 LET N(13)=N(1)*.5
50 LET N(8)=N(13)/.75
55 LET TC2=(N(8)-N(13))/5
60 FOR X=1 TO 4
65 LET N(X+8)=N(8)-X*TC2
70 NEXT X
75 LET N(7)=(N(6)+N(8))/2
80 FOR X=13 TO 49
85 LET N(X)=N(X-12)/2
90 NEXT X
95 LET N(50)=8
100 PRINT : PRINT : PRINT
105 PRINT "              Chorus of"
108 PRINT : PRINT
110 PRINT "          ROLL OUT THE BARREL"
111 PRINT : PRINT
112 PRINT "                  by"
113 PRINT
114 PRINT "              LEW BROWN"
115 PRINT
116 PRINT "          WLADIMIR A. TIMM"
```

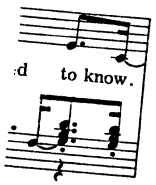
```
117 PRINT
118 PRINT "                    and"
119 PRINT
120 PRINT "            JAROMIR VEJVODA"
122 PRINT : PRINT : PRINT : PRINT
123 PRINT "          arranged for Memotech"
271 LET A=10
272 LET B=7
273 LET C=7
274 LET D=10
275 LET H=1
276 FOR X=1 TO 3
277 GOSUB 380
278 NEXT X
279 LET H=100
280 FOR X=1 TO 2
281 GOSUB 380
282 NEXT X
283 SOUND 0,0,0
284 FOR X=1 TO 4
285 GOSUB 380
286 NEXT X
287 SOUND 0,0,0
288 FOR X=1 TO 4
289 GOSUB 380
290 NEXT X
291 SOUND 0,0,0
292 FOR X=1 TO 4
293 GOSUB 380
294 NEXT X
295 SOUND 0,0,0
296 FOR X=1 TO 2
297 GOSUB 380
298 NEXT X
299 LET A=15: LET B=10: LET C=10: LET D=12
300 FOR X=1 TO 208
301 GOSUB 380
302 NEXT X
303 SOUND 1,0,0: SOUND 4,0,0
304 FOR X=1 TO 34
305 GOSUB 380
306 NEXT X
307 LET A=13: LET B=9: LET C=9: LET D=10
308 FOR X=1 TO 4
309 GOSUB 380
310 NEXT X
311 SOUND 2,0,0
312 FOR X=1 TO 4
313 GOSUB 380
314 NEXT X
315 SOUND 4,0,0
316 FOR X=1 TO 6
317 GOSUB 380
318 NEXT X
319 LET A=15: LET B=10: LET C=10: LET D=12
320 RESTORE 705
321 FOR X=1 TO 208
322 GOSUB 400
323 NEXT X
324 SOUND 0,0,0: SOUND 2,0,0
325 FOR X=1 TO 32
326 GOSUB 400
327 NEXT X
328 RESTORE 865
329 FOR X=1 TO 10
330 GOSUB 400
331 NEXT X
332 LET A=15: LET B=15: LET C=15: LET DD=15
333 FOR X=1 TO 6
334 GOSUB 380
335 NEXT X
336 PAUSE 500: CLS
337 GOTO 337
380 READ V1,V2,V3,V4
390 SOUND 1,N(V1),A: SOUND 2,N(V2),B: SOUND 4,N(V3),C: SOUND 0,N(V4),D
395 PAUSE H
397 RETURN
400 READ V1,V2,V3,V4
401 SOUND 0,N(V1),A: SOUND 1,N(V2),B: SOUND 2,N(V3),C: SOUND 4,N(V4),D
402 PAUSE H
403 RETURN
695 DATA  37,25,50,50,39,27,50,50,41,29,50,50,50,50,50,18,50,50,50,18,30,25,22,18,30,25,22,18,5
0,50,50,15,50,50,50,15,30,25,22,15,30,25,22,15
700 DATA  50,50,50,13,50,50,50,13,30,27,25,13,30,27,25,13,50,50,50,10,50,50,50,10,30,27,25,10,3
0,27,25,10
705 DATA  36,33,50,6,37,34,50,6,37,34,25,50,37,34,25,50,37,34,50,1,37,34,50,1,37,34,25,50,37,34,
25,50
710 DATA  36,33,50,6,37,34,50,6,37,34,25,50,37,34,25,50,37,34,50,1,37,34,50,1,36,33,24,50,36,33,
24,50
715 DATA  37,34,25,6,37,34,25,6,39,35,27,50,39,35,27,50,39,35,50,1,39,35,50,1,39,35,30,50,39,35,
30,50
720 DATA  39,35,50,6,39,35,50,6,39,35,30,50,39,35,30,50,39,35,50,1,39,35,50,1,39,35,30,50,39,35,
30,50
725 DATA  37,34,25,6,37,34,25,6,39,35,27,50,39,35,27,50,39,35,27,1,39,35,27,1,37,34,25,50,37,34
,25,50
730 DATA  39,30,27,6,39,30,27,6,37,34,25,50,37,34,25,50,37,34,25,1,37,34,25,1,36,33,24,50,36,33,
24,50
735 DATA  35,32,23,8,35,32,23,8,35,32,27,8,35,32,27,8,35,32,50,5,35,32,50,5,35,32,27,5,35,32,27
,5
740 DATA  35,32,50,3,35,32,50,3,35,32,27,3,35,32,27,3,35,32,50,1,35,32,50,1,35,32,27,1,35,32,27
,1
745 DATA  38,34,50,8,39,35,50,8,39,35,27,50,39,35,27,50,39,35,50,1,39,35,50,1,39,35,27,50,39,35,
27,50
750 DATA  38,34,50,8,39,35,50,8,39,35,27,50,39,35,27,50,39,35,50,1,39,35,50,1,38,34,26,50,38,34,
26,50
755 DATA  39,35,27,8,39,35,27,8,41,37,29,50,41,37,29,50,41,37,50,1,41,37,50,1,41,37,35,50,41,37
,35,50
760 DATA  41,37,50,8,41,37,50,8,41,37,35,50,41,37,35,50,41,37,50,1,41,37,50,1,41,37,35,50,41,37
,35,50
765 DATA  39,35,27,8,39,35,27,8,41,37,29,50,41,37,29,50,41,37,29,1,41,37,29,1,39,35,27,50,39,35,
27,50
770 DATA  41,37,29,8,41,37,29,8,39,36,27,50,39,36,27,50,39,36,27,1,39,36,27,1,38,35,26,50,38,
35,26,50
775 DATA  37,34,25,6,37,34,25,6,37,34,30,6,37,34,30,6,37,34,50,5,37,34,50,5,37,34,30,5,37,34,3
0,5
780 DATA  37,34,50,3,37,34,50,3,37,34,30,3,37,34,30,3,37,34,50,1,37,34,50,1,37,34,30,1,37,34,30
,1
785 DATA  36,33,50,6,37,34,50,6,37,34,25,50,37,34,25,50,37,34,50,1,37,34,50,1,37,34,25,50,37,34,
25,50
790 DATA  36,33,50,6,37,34,50,6,37,34,25,50,37,34,25,50,37,34,50,1,37,34,50,1,36,33,24,50,36,33,
24,50
795 DATA  37,34,25,6,37,34,25,6,39,35,27,50,39,35,27,50,39,35,50,1,39,35,50,1,39,35,30,50,39,
35,30,50
800 DATA  39,35,50,6,39,35,50,6,39,35,27,50,39,35,27,50,39,35,50,1,39,35,50,1,39,35,30,50,39,35
,30,50
805 DATA  37,34,25,6,37,34,25,6,39,35,27,50,39,35,27,50,39,35,27,1,39,35,27,1,37,34,25,50,37,34
,25,50
810 DATA  39,35,27,6,39,35,27,6,37,34,25,50,37,34,25,50,37,34,25,6,37,34,25,6,30,28,22,50,30,28
,22,50
815 DATA  39,50,27,11,39,50,27,11,39,35,30,50,39,35,30,50,39,50,27,6,39,50,27,6,39,35,30,50,39
,35,30,50
820 DATA  39,50,27,10,39,50,27,10,39,37,31,50,39,37,31,50,39,50,27,3,39,50,27,3,39,37,31,50,3
9,37,31,50
```







```
825 DATA      32,27,23,8,32,27,23,8,34,50,23,50,34,50,23,50,35,32,27,6,35,32,27,6,37,50,27,50,37,
50,27,50
830 DATA    41,33,27,5,41,33,27,5,41,33,27,50,41,33,27,50,41,50,50,5,41,50,50,5,39,33,27,50,39,33
,27,50
835 DATA   39,35,27,6,39,35,27,6,37,34,25,50,37,34,25,50,37,34,50,1,37,34,50,1,37,34,25,50,37,34,
25,50
840 DATA   37,34,50,6,37,34,50,6,50,34,25,50,50,34,25,50,36,33,24,1,36,33,24,1,37,34,25,50,37,34,
25,50
845 DATA    39,36,30,20,39,36,30,20,39,36,30,18,39,36,30,18,39,36,30,17,39,36,30,17,39,36,30,15,3
9,36,30,15
850 DATA  41,35,32,13,41,35,32,13,41,35,32,11,41,35,32,11,41,35,32,10,41,35,32,10,41,35,32,8,41,
35,32,8
855 DATA     42,34,30,6,42,34,30,6,50,37,50,50,50,39,50,50,50,37,28,7,50,37,28,7,50,37,50,50,50,3
9,50,50
860 DATA      37,35,29,8,37,35,29,8,41,37,29,50,42,39,30,50,44,41,32,25,46,42,34,25,47,44,35,25,4
8,45,36,25
865 DATA      42,30,25,6,42,30,25,6,34,30,22,18,35,32,23,20,37,34,25,22,38,35,26,23,39,36,27,24,4
1,35,29,20
870 DATA      42,34,30,6,42,34,30,6,50,50,50,50,50,50,50,50,42,37,34,6,42,37,34,6,50,50,50,50,50,
50,50,50
```



Statement Producer

C J Greenway

```
1 REM This program produces statemnts
5 DEF FNLC$(H,V)=CHR$(3)+CHR$(32+H)+CHR$(32+V):REM screen settings
20 DIM DETAIL$(30), AMOUNT$(30): REM upto 30 items on a statement
40 X$="                                                ":REM 40 long
49 GOTO 90
50 REM screen handling sub routines
52 PRINT CHR$(12):GOSUB 60:RETURN:REM this clears screen
53 VI=V: FOR I= V TO 22: GOSUB 60: PRINT CHR$(5): V=V+1:NEXT:V=VI:RETURN:REM
 this clears from cursor down
59 REM screen handling
60 PRINT FNLC$(H,V);:RETURN: REM this positions cursor at V,H -see  5
90 GOSUB 52:INPUT "Date for Statements ",DATE$
100 V=1:H=0: GOSUB 52
110 INPUT"Name of Customer ",NA$
120 FOR X=1 TO 4:V=V+1:INPUT "Address line ",ADDRESS$(X):NEXT
140 INVCOUNT=1
150 PRINT:V=10:H=0:GOSUB 53
160 GOSUB 60:PRINT "ENTRY ";INVCOUNT;" ENTER DETAILS OF INVOICE":V=11:GOSUB 60
170 INPUT" ", DETAIL$(INVCOUNT)
180 INPUT "AMOUNT OF INVOICE ",Z$
200 DETAIL$(INVCOUNT)=LEFT$(DETAIL$(INVCOUNT)+X$,40)
210 GOSUB 500
220 AMOUNT$(INVCOUNT)=RIGHT$(X$+Z$,10)
230 H=0:V=20:GOSUB 60:PRINT "FURTHER ITEMS ? (Y/N) ";
233 YN$=INKEY$
240 IF YN$="Y" OR YN$="y" THEN H=0:INVCOUNT=INVCOUNT+1: GOTO 150
250 IF YN$="N" OR YN$="n" THEN GOTO 300
260 GOTO 233
299 REM This is printing
300 LPRINT CHR$(27);"W";CHR$(1);"C.J.GREENWAY FCA";CHR$(27);"W";CHR$(0):REM
expanded print
310 LPRINT"================================"
320 LPRINT"Wayside, Worcester Road, Salford, Chipping Norton, Oxon, OX7 5YJ"
330 LPRINT "Telephone 0295 69477"
340 FOR A=1 TO 5:LPRINT:NEXT
350 LPRINT NA$
360 FOR A=1 TO 4: LPRINT ADDRESS$(A):NEXT:FOR A=1 TO 3 :LPRINT:NEXT
370 TOTAL=0
380 LPRINT CHR$(27);"W";CHR$(1); "       STATEMENT";CHR$(27);"W";CHR$(0)
390 LPRINT:LPRINT"                as at ";DATE$
395 LPRINT:LPRINT "                                                £"
400 FOR A=1 TO INVCOUNT:LPRINT DETAIL$(A);AMOUNT$(A)
410 TOTAL=TOTAL+VAL(AMOUNT$(A))
420 NEXT
430 Z$=STR$(TOTAL):GOSUB 500:Z$=RIGHT$(X$+Z$,12)
440 LPRINT:LPRINT"TOTAL AMOUNT DUE                        £";Z$
450 LPRINT CHR$(12):
460 GOSUB 52: PRINT "ANOTHER INVOICE ";
465 YN$=INKEY$
470 IF YN$="Y" OR YN$="y" THEN 100
480 IF YN$="N" OR YN$="n" THEN 499
490 GOTO 465
499 END
500 LET I=LEN (Z$):ZZ=I:FOR Q=1 TO I:REM this S/Routine for Decimal point
510 IF MID$(Z$,Q,1)="." THEN GOTO 540
515 NEXT
540 IF ZZ-Q=-1 THEN Z$=Z$+".00":RETURN
550 IF ZZ-Q=0 THEN Z$=Z$+"00":RETURN
560 IF ZZ-Q=1 THEN Z$=Z$+"0":RETURN
570 IF ZZ-Q=2 THEN RETURN
580 IF ZZ-Q>2 THEN I=Q+2 :Z$=LEFT$(Z$,I):RETURN
```

BASIC GRAPHICS Part 6

Michael Gant

This month, we are going to begin a series on sprite graphics. To begin with, let's find out exactly what sprite graphics are.

A sprite, is a shape that can easily be moved around the screen by the user. Unlike user definable graphics, they can be moved one pixel at a time in any direction. The way in which sprites are displayed on the screen is very special. They are not drawn on to the screen but are overlaid by the graphics chip (VDP).

Each sprite has its own priority on the screen. Sprite No. 32 has the lowest priority and will appear to be behind all of the other sprites. Sprite No. 1 has the highest priority and will appear to be in front of all other sprites.

The sprite data is calculated in a similar fashion to that used by user definable graphics. However, the way in which the data is used once calculated, is different. The data is stored in memory as a sequence of patterns, each of which can be used by any or all sprites at once.

Here is a program to display one sprite on the screen, together with a detailed explanation of how it works.

```
1 VS 4:CLS
5 REM EXAMPLE 1
10 GENPAT 3,1,16,16,16,255,16,16,16,0
20 CTLSPR 2,1
30 CTLSPR 6,0
40 SPRITE 1,1,128,96,0,0,15
50 GOTO 50
```

Line 10 defines sprite pattern 1 as a cross. It uses GENPAT function 3 to create an 8 by 8 sprite pattern.

Line 20 is a ConTroL SPRite command. It defines the number of sprites to be displayed on the screen. The value following the command is used to select the mode. The modes of operation are shown below:-

0 - define the speed of moving sprites. e.g. CTLSPR 0,10
1 - define the distance in pixels to move using when using the MVSPR command. e.g. CTLSPR 1,4
2 - define the number of sprites to be displayed e.g. CTLSPR 2,2
3 - define the number of circling sprites. If a circling sprite goes off the screen, it will reappear at the other side. e.g. CTLSPR 3,2
4 - define the sprite number of the plot sprite. This is a special sprite that PLOT's a pixel on the screen as it moves. e.g. CTLSPR 4,1
5 - define the number of auto-moving sprites. If this command is omitted then all sprites are assumed to be stationary. Sprites can be made to travel automatically. More on this follows.
6 - this defines the sprite size and magnification. The different modes are:-

```
CTLSPR 6,0:REM 8 by 8 pixel sprites. No magnification.
CTLSPR 6,1:REM 8 by 8 pixel sprites. Double magnification
CTLSPR 6,2:REM 16 by 16 pixel sprites. No magnification
CTLSPR 6,3:REM 16 by 16 pixel sprites. Double magnification
```

Therefore, line 30 defines the sprite as being 8 by 8 pixels in size, without magnification. Try changing line 30 to read:-

```
30 CTLSPR 6,1
```

This should cause the cross to become twice as large.

Line 40 actually places the sprite on the screen. The values following the command define the sprite number, pattern number, x and y coordinates of sprite on the screen, the x and y speeds of the sprite

(0) and the colour number. The values I have used should be self explanatory. As we defined sprite pattern 1 earlier, we obviously use that pattern number. Unfortunately, we now come across a slight problem! Quite simply, the coordinate system used by sprites is different to the one used by PLOT, LINE etc. Setting a sprite with coordinates 0,0 causes it to be displayed at the top left corner of the screen. Therefore, the x coordinate is the same using either sprites or graphics. Converting between the two systems is quite easy. The following program performs the conversion for us.

```
 999 REM EXAMPLE 2
1000 REM X AND Y  ARE COORINATES TO BE CONVERTED
1010 REM ON EXIT, X1 AND X2 ARE THE CONVERTED COORDINATES
1020 LET X1=X:REM X1 IS THE SAME AS X
1030 LET Y1=192-Y:REM Y1 EQUALS 192 MINUS THE Y COORDINATE
1040 RETURN
```

The program will convert either sprite to graphics or graphics to sprite systems.

There are two ways to move sprites. The first way is as follows:-

```
 1 REM EXAMPLE 3
 5 VS 4:CLS
10 GENPAT 3,1,16,16,16,254,16,16,16,0
20 CTLSPR 2,1
30 CTLSPR 6,0
40 FOR F=0 TO 255
50 SPRITE 1,1,F,96,0,0,15
60 NEXT F
```

This program sets up a sprite as shown earlier, and repeatedly changes the coordinates of the sprite in a loop using the SPRITE command. Although the example is fast, more complicated programs would soon suffer a serious case of sluggishness. The easy way around this problem is to use auto-move sprites. These only need setting up once, and until stopped, they will move around the screen without further instructions or updating. To produce the same effect as the last example, use something like this...

```
1 REM EXAMPLE 4
5 VS 4:CLS
10 GENPAT 3,1,16,16,16,254,16,16,16,0
20 CTLSPR 0,1
30 CTLSPR 2,1
40 CTLSPR 6,0
50 CTLSPR 5,1
60 SPRITE 1,1,0,96,25,0,15
70 GOTO 70
```

The extra CTLSPR commands set up the speed and number of moving sprites. Both of these values are set to 1. The only other difference is in line 60. The speed value for the X coordinate has been changed to 25. This causes movement across the screen. Setting it back to 0, and changing the other speed value would cause the sprite to travel down the screen. Obviously, it is possible to have any combination of values for the speeds. Also, if you want faster sprites, simply change the value 25 to 100 or 150 and see the difference! Using negative values for the speeds will allow the sprite to move upwards, or to the left.

Before we finish this month's article, let's look at the ADJust SPRite command. It is used to adjust values already defined using the SPRITE command. As an example, change line 50 of example 3 to read:-

```
50 ADJSPR 2,1,F
```

and add line 35:-

```
35 SPRITE 1,1,0,96,0,0,15
```

This should have the same effect as before, although it can be seen that line 50 is less complicated than previously and is therefore more efficient.

The format of the ADJSPR command is shown below:-

```
ADJSPR mode,spritenumber,value
```

where the modes and relevant values are as follows:-

```
MODE 0 - change the pattern number to value
MODE 1 - change the colour to value
MODE 2 - change the x position to value
MODE 3 - change the y position to value
MODE 4 - change the x speed to value
MODE 5 - change the y speed to value
```

Try adding the following line to example 3 to produce a flashing cross.

```
45 ADJSPR 1,1,MOD(F,16)
```

I'm afraid that's all for this month. In the next issue I will cover the remaining, more advanced sprite commands. Why not try writing a program that moves a sprite using the keyboard INKEY$ function. Until next month, have fun!!★

More About Edasm

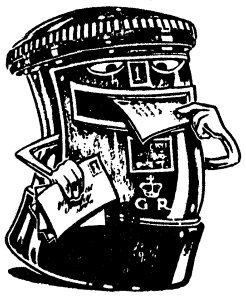
This Macro returns the programmer back to EDASM by pressing the <ESC> key after testing a program. (instead of typing USER in Basic).

The routine below the Macro shows how to interface it with a program which is to be tested.

After typing in the Macro and routine. Quit EDASM and type RAND USR (32775) and press the <RET> key. Then press <ESC> key to return to EDASM.

```
DEFMAC ("ESCAPE")       ; Define Macro "ESCAPE"
       XOR A            ; Clear A
       CALL 00079H      ; Call keyboard scan
       CP 01BH          ; Has <ESC> been pressed
       RET NZ           ; If not return.
       JP 0F125H        ; Jump to restart EDASM location.
       END.

       OR
       DB 0FAH                  ; XOR A
       DB 0CDH,079H,000H        ; CALL 00079H
       DB 0FEH,0BIH             ; CP 01BH
       DB 0C0H                  ; RET NZ
       DB 0C3H,025H,0FIH        ; JP 0F125H

       ORG  08007H              ; OR 32775
       LOAD 08007H              ; Load Code at 8007H
LOOP:  NOP                      ; or end of program.
       CALL EDASM               ; Call return to EDASM routine
       JP LOOP                  ; Loop back to program on test
EDASM: ESCAPE                   ; Macro to test for return to
       END                      ; EDASM
```

Basic Line



Two months ago we started Assembly Line and we realise that there are many useful routines that can be put forward for Basic users. So, here we are with your own column. If you have any routines that you think may be useful to other members send them in ....we are only looking for small programs. You can also return modified versions of routines already published, but please make sure that you fully document what the routine is supposed to do.

How to obtain the length of a DIMensioned string .....

```
1 DIM A$(12,10):LET X$="":LET L$=""
2 LET A$(1)="KEITH"
3 PRINT A$(1):PRINT
4 LET I=LEN(A$(1))
5 FOR X=1 TO I:LET X$=MID$(A$(1),A,1)
6 IF ASC(X$)=0 THEN NEXT ELSE LET L$=L$+X$:NEXT
7 PRINT "THE LENGTH OF L$ IS:- "; LEN(L$)
8 GOTO 8
```

String Comparison .....

```
1 DIM A$(5,10),I$(1,10)
2 LET I$(1)="": LET A$(1) = "MEMOTECH"
3 INPUT I$(1)
4 IF I$(1)=A$(1) THEN PRINT "YES"
6 GOTO 3
```

The above routine compares to DIMensioned string arrays. The secret lies in setting up a test string identical in dimension to the string to be tested .... Line 1.

Check that a string input does not exceed n number of characters. Assume In the following example that n=8 and that no more than 8 characters are to be allowed when the program prompts for an input.

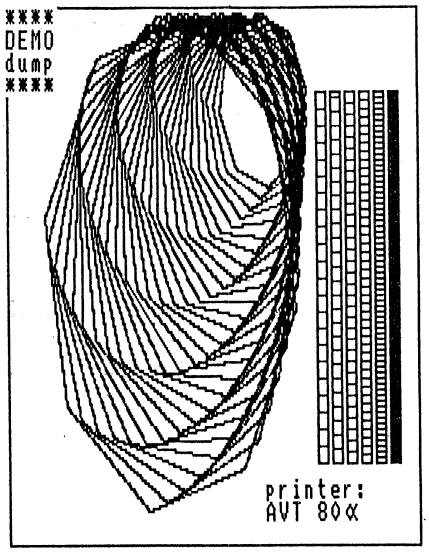
```
10 DIM INP$(1,8)  ..... INP$= INPUT STRING.
*********
*********   REST OF PROGRAM.
*********
..........THE NEXT PART IS CALLED AS A SUBROUTINE
100 LET INP$=""
110 LET CHECK = 0
120 LET X$ =INKEY$
130 IF X$ = "" THEN GOTO 120
140 INP$=INP$+X$
150 CHECK = CHECK + 1
160 IF CHECK = 8 THEN RETURN ELSE GOTO 120
```

You can, of course, add a few more useful test eg If the BS is pressed then don't count it within the string, or add it to the string.★

Pascal

Renè ter Beek

```
PROGRAM UTILITIES;

{
Written FOR MTX computers
using Hisoft pascal
by Rene ter Beek
the Hague, the Netherlands
May 1985

PROCEDURES RST10 up to ATTR
by S.Varley, published IN
GENPAT No. 4

mind that GR has been
changed: it's returning an
INTEGER instead OF a CHAR
*****************************
```



PROCEDURES:

PAUSE(x)
will cause a pause OF x seconds.

BITIMAGE (x)
send x*256 bytes TO the printer, using dual-density bitimage mode. This code can be used FOR all Epsom-compatible printers.

RESETPRINTER
reset all special modes OF printer TO power up state .

SETLINEFEED (x)
sets line spacing TO x/216" UNTIL changed.

CIRCLE (x, y, r,s)
will draw a circle WITH x AND y as centre-co-ordinates, r as radius IN the same way as the basic-command circle. There is only one addition:s, which stands FOR SHAPE. The BASIC circle is an oval. The variable SHAPE makes it possible TO correct the shape. TO create a 'round' circle, use shape 1.36 OR simply 0. When a screendump WITH a correct circle is desired, use other numbers FOR SHAPE..see DUMP instructions. SHAPE does only affect the x-co-ordinates.

POLYGON (x,y,a,r,st,s)
will draw a polygon. x & y are centre co-ordinates, a is the number OF angles, WHILE r is the radius.st stands FOR STARTPOSITION. By changing this, the polygon turns around its centre. Just use 0 TO ensure the base OF the polygon will be horizontally, FOR s OF SHAPE see above (CIRCLE).

FILL (x,y,s)
fills any object when x & y coordinates are given OF a point within the object. WITH s you can specify the step between the lines which will fill the object. IN this way you can hatch various figures. TO see how FILL works TYPE IN the following:

```
        POLYGON (220,95,7,80,0,4);FILL (220,95,2);
```

AND add IN the PROCEDURE FILL just after RX[R,Y]:=X (at the END OF the main loop):plot(x-100,y);.
This is just a simple fill routine AND very complicated objects might NOT be filled completely. IN this CASE just use another FILL WITH an x AND y within the unfilled area AND the problem has been solved.

FRAME
An easy way TO frame the screen.

VP2 & VP4
procedures which will convert data FOR DUMP.

DUMP (h,v,1)
Dumps the graphic screen TO a printer, e.g. DUMP (2,1,10) will give a screendump where the points are printed horizontally twice AND vertically once, WITH a linefeed OF 10/216". It depends on the capability OF the printer, how many dots per line can be accepted.. An AVT 80 can accept 1280 dots per line, so the h can NOT be more than 5 (5*256=1280). So 4 is the maximum FOR an Epsom printer WITH 1152 dots per line. The dump can be interrupted by pressing ESC. Because it's too complicated TO use DUMP FOR a simple screendump, 4 standard dumps can be produced:

DUMP1, DUMP 2, DUMP 3, DUMP 4.
DUMP4 is only possible IF 1280 dots per line can be accepted.
TO produce correct circles OR equilateral polygons use the following SHAPEs:

DUMP1: SHAPE 0.83 (time about 90 sec.)
DUMP2: SHAPE 0.671 (time about 120 sec.)
DUMP3: SHAPE 0.9 (time about 150 sec.)
DUMP4: SHAPE 1.09 (time about 180 sec.)

IF a certain dump has TO be produced. the best way TO use SHAPE is TO enter the value as a CONSTant at the start OF the PROGRAM.
]★

```
VAR Y,X:INTEGER;

PROCEDURE PAUSE(SEC:1..MAXINT);

 VAR
   X:0..16000;
   Y:0..MAXINT;

  BEGIN
    FOR Y:=0 TO SEC DO
    BEGIN
      FOR X:=0 TO 16000 DO
    END;
  END;


PROCEDURE RST10(N:1..12;DATA:ARRAY[1..12] OF CHAR);

  VAR
   I:INTEGER;

   BEGIN
     POKE(#C000,CHR(#DD));
     POKE(#C001,CHR(#E5));
     POKE(#C002,CHR(#D7));
       DATA[1]:=CHR(ORD(DATA[1])+#80);

     FOR I:=1 TO N DO
       POKE(#C002+I,DATA[I]);
       POKE(#C002+I,CHR(#DD));
       POKE(#C003+I,CHR(#E1));
       POKE(#C004+I,CHR(201));
     USER(#C000)
  END;


PROCEDURE VIEW(DIR:0..7;DIS:0..255);

  VAR
   N:1..12;
   DATA:ARRAY[1..12] OF CHAR;

  BEGIN
    N:=4;
     DATA[1]:=CHR(3);
     DATA[2]:=CHR(20);
     DATA[3]:=CHR(DIR);
     DATA[4]:=CHR(DIS);
    RST10(N,DATA);
  END;
```

```
PROCEDURE MVSPR(P:0..15;SN:1..32;D:INTEGER);

  VAR
   N:1..12;
   DATA:ARRAY[1..12] OF CHAR;

  BEGIN
    N:=5;
     DATA[1]:=CHR(4);
     DATA[2]:=CHR(19);
     DATA[3]:=CHR(P);
     DATA[4]:=CHR(SN);
     DATA[5]:=CHR(D);
    RST10(N,DATA)
  END;


PROCEDURE ADJSPR(P:0..5;SN:1..32;V:0..255);

  VAR
   N:1..12;
   DATA:ARRAY[1..12] OF CHAR;

  BEGIN
    N:=5;
     DATA[1]:=CHR(4);
     DATA[2]:=CHR(17);
     DATA[3]:=CHR(P);
     DATA[4]:=CHR(SN);
     DATA[5]:=CHR(V);
    RST10(N,DATA)
  END;


PROCEDURE CTLSPR(P:0..6;SN:0..255);

  VAR
   N:1..12;
   DATA:ARRAY[1..12] OF CHAR;

  BEGIN
    N:=4;
     DATA[1]:=CHR(3);
     DATA[2]:=CHR(14);
     DATA[3]:=CHR(P);
     DATA[4]:=CHR(SN);
    RST10(N,DATA)
  END;
```

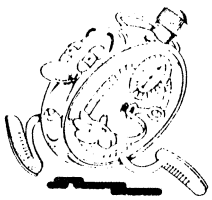
```
PROCEDURE SPRITE(SN:1..32;P:0..127;XP,YP:-4095..4095;XS,YS:-128..127;COL:0..15);

  VAR
   N:1..12;
   DATA:ARRAY[1..12] OF CHAR;

  BEGIN
    N:=11;
     DATA[1]:=CHR(10);
     DATA[2]:=CHR(18);
     DATA[3]:=CHR(SN);
     DATA[4]:=CHR(P);
     DATA[5]:=CHR(XP MOD 256);
     DATA[6]:=CHR(XP DIV 256);
     DATA[7]:=CHR(YP MOD 256);
     DATA[8]:=CHR(YP DIV 256);
     DATA[9]:=CHR(XS);
     DATA[10]:=CHR(YS);
     DATA[11]:=CHR(COL);
    RST10(N,DATA)
  END;
PROCEDURE CSR(X:0..39;Y:0..23);

  VAR
   N:1..12;
   DATA:ARRAY[1..12] OF CHAR;

  BEGIN
    N:=4;
     DATA[1]:=CHR(3);
     DATA[2]:=CHR(3);
     DATA[3]:=CHR(X);
     DATA[4]:=CHR(Y);
    RST10(N,DATA)
  END;


PROCEDURE COLOUR(P:0..4;N:0..15);

  VAR
   C:1..12;
   DATA:ARRAY[1..12] OF CHAR;

  BEGIN
    C:=4;
     DATA[1]:=CHR(3);
     DATA[2]:=CHR(16);
     DATA[3]:=CHR(P);
     DATA[4]:=CHR(N);
    RST10(C,DATA)
  END;


PROCEDURE GENPAT(P:0..7;N:0..154;D1,D2,D3,D4,D5,D6,D7,D8:0..255);

  VAR
   C:INTEGER;
   DATA:ARRAY[1..12] OF CHAR;

  BEGIN
    C:=12;
     DATA[1]:=CHR(11);
     DATA[2]:=CHR(15);
     DATA[3]:=CHR(P);
     DATA[4]:=CHR(N);
     DATA[5]:=CHR(D1);
     DATA[6]:=CHR(D2);
     DATA[7]:=CHR(D3);
     DATA[8]:=CHR(D4);
     DATA[9]:=CHR(D5);
     DATA[10]:=CHR(D6);
     DATA[11]:=CHR(D7);
     DATA[12]:=CHR(D8);
    RST10(C,DATA)
  END;


PROCEDURE GR(X:0..255;Y:0..191;B:1..8;VAR P:0,.256);

  VAR
   C:1..12;
   DATA:ARRAY[1..12] OF CHAR;

   BEGIN
     C:=6;
        DATA[1]:=CHR(5);
        DATA[2]:=CHR(27);
        DATA[3]:=CHR(67);
        DATA[4]:=CHR(X);
        DATA[5]:=CHR(Y);
        DATA[6]:=CHR(B);
       RST10(C,DATA);
    P:=PEEK(#FE1A,0..256)
   END;


PROCEDURE ATTR(P:0..3;STATE:0..1);
  VAR
   C:INTEGER;
   DATA:ARRAY[1..12] OF CHAR;

  BEGIN
    C:=5;
    DATA[1]:=CHR(4);
    DATA[2]:=CHR(27);
    DATA[3]:=CHR(65);
    DATA[4]:=CHR(P);
    DATA[5]:=CHR(STATE);
      RST10(C,DATA)
  END;


PROCEDURE BITIMAGE(HP:1..5);

  BEGIN
    WRITE(CHR(27),'L',CHR(0),CHR(HP))
  END;

PROCEDURE RESETPRINTER;

  BEGIN
    WRITE(CHR(27),'@')
  END;


PROCEDURE SETLINEFEED(LF:1..255);

  BEGIN
    WRITE(CHR(27),'3',CHR(LF))
  END;


PROCEDURE PRINTERON;

  BEGIN
    POKE(#FD75,CHR(1));
    POKE(#FA8F,CHR(1))
  END;


PROCEDURE PRINTEROFF;

  BEGIN
    POKE(#FD75,0)
  END;
```

```
PROCEDURE CIRCLE(X,Y:INTEGER;RADIUS:REAL;SHAPE:REAL);

  VAR
   STEPRD,RD:REAL;
   C1:0..255;
   C2:0..191;

  BEGIN
    IF SHAPE=0 THEN SHAPE:=1.36;
     RD:=0;
     STEPRD:=4.7/(6.28*RADIUS*(ABS(SHAPE-1.36)+1));
       WHILE RD<6.28 DO

         BEGIN
          C1:=ROUND((RADIUS/SHAPE)*COS(RD))+X;
          C2:=ROUND(RADIUS*SIN(RD))+Y;
           IF (C1>=0) AND (C2>=0) AND (C1<=255) AND (C2<=191) THEN
          PLOT(C1,C2);
          RD:=STEPRD+RD;
         END;
  END;


PROCEDURE POLYGON(X:0..255;Y:0..191;ANGLES,RADIUS:0..MAXINT;START,SHAPE:REAL);

   CONST
    PI=3.14159265;

   VAR
    P1,P3:0..255;
    P2,P4:0..191;
    SHRAD,F,A:REAL;
    PL:INTEGER;
BEGIN
IF (Y+RADIUS<=191) AND (Y-RADIUS)=0) THEN

   BEGIN
    IF SHAPE=0 THEN SHAPE:=1.36;
    IF (START=0) AND (ANGLES=4)  THEN
     START:=(7/4)*PI    (IF quadrangular start at this point)
    ELSE
     IF START=0  THEN
     START:=0.5*PI;      (ELSE start from top)
     F:=(2*PI)/ANGLES;

     SHRAD:=RADIUS/SHAPE;
FOR PL:=ANGLES DOWNTO 1 DO
BEGIN
     A:=START+F;
        P1:=ROUND(SHRAD*COS(START))+X;
        P2:=ROUND(RADIUS*SIN(START))+Y;
        P3:=ROUND(SHRAD*COS(A))+X;
        P4:=ROUND(RADIUS*SIN(A))+Y;
           LINE(P1,P2,P3,P4);
        START:=A;
      END;
END;
END;


PROCEDURE FILL(X:0..255;Y,STEP:0..191);

  VAR
   DIR:-1..1;
   R:1..2;
   Q,T,P:0..1;
   XSTART:0..255;
   YSTART,YMIN,YMAX:0..191;
   RX:ARRAY[1..2] OF ARRAY[0..191] OF INTEGER;
   REDIR:BOOLEAN;

  BEGIN
   GR(SUCC(X),Y,1,P);
    IF P=0 THEN
      REPEAT
        X:=SUCC(X);
        GR(SUCC(X),Y,1,P);
      UNTIL P=1;

XSTART:=X;
YSTART:=Y;
REDIR:=FALSE;
DIR:=1;
R:=1;

REPEAT
    GR(X,Y-DIR,1,Q);
    IF Q=0 THEN
      BEGIN
        Y:=Y-DIR;
        GR(X+DIR,Y,1,T);
        IF T=0 THEN
          REPEAT
            X:=X+DIR;
            GR(X+DIR,Y,1,T);
          UNTIL T=1;
      END
   ELSE
     BEGIN
       GR(X-DIR,Y,1,P);
         IF P=0 THEN
           BEGIN
             REPEAT
               X:=X-DIR;
               GR(X-DIR,Y,1,P);
               GR(X,Y-DIR,1,Q);
             UNTIL (Q=0) OR (P=1);
              IF Q=0 THEN
               Y:=Y-DIR
           END;
         IF P=1 THEN
           REDIR:=TRUE
     END;

   IF REDIR THEN
     BEGIN
       IF R=1 THEN
         BEGIN
           YMIN:=Y;
           R:=SUCC(R);
         END
      ELSE
       BEGIN
         YMAX:=Y;
         R:=PRED(R)
       END;
      DIR:=-DIR;
      REDIR:=FALSE
     END;

    RX[R,Y]:=X;
 UNTIL (X=XSTART) AND (Y=YSTART);

   IF STEP<1 THEN
     STEP:=1;
   Y:=PRED(YMIN)+STEP;

     WHILE Y<=YMAX DO
       BEGIN
         LINE(RX[1,Y],Y,RX[2,Y],Y);
         Y:=Y+STEP;
       END
END;
```

```
PROCEDURE FRAME;

  BEGIN
    LINE(0,0,255,0);
    LINE(255,0,255,191);
    LINE(255,191,0,191);
    LINE(0,191,0,0);
  END;


PROCEDURE VP2(P:0..15;VAR LP:0..255);

  BEGIN
    IF P DIV 8=1 THEN
      BEGIN
        LP:=192;
        P:=P MOD 8
      END;
    IF P DIV 4=1 THEN
      BEGIN
        LP:=LP+48;
        P:=P MOD 4
      END;
    IF P DIV 2=1 THEN
      BEGIN
        LP:=LP+12;
        P:=P MOD 2
      END;
    IF P=1 THEN
      LP:=LP+3
  END;


PROCEDURE VP4(P:1..2;VAR LP:0..255);

  BEGIN
    IF P DIV 2=1 THEN
      BEGIN
        LP:=240;
        P:=P MOD 2
      END;
    IF P=1 THEN
      LP:=LP+15
  END;
```

```
PROCEDURE DUMP(HP:1..5;VP:1..3;LF:1..255);

  VAR
   X:0..255;
   Y:0..191;
   S:1..5;
   LP,P:0..256;
   B:INTEGER;
   CONTINUE:BOOLEAN;

  BEGIN
    VS(4);
      IF VP=3 THEN B:=2
    ELSE
     B:=4;
     Y:=191;
     CONTINUE:=TRUE;
       PRINTERON;
       SETLINEFEED(LF);

       WHILE (Y>0) AND CONTINUE DO
         BEGIN
           BITIMAGE(HP);
           PRINTEROFF;

           FOR X:=0 TO 255 DO
             BEGIN
               GR(X,Y,B,P);
               LP:=0;
                IF VP=1 THEN LP:=P
               ELSE
                IF VP=2 THEN VP2(P,LP)
               ELSE
                VP4(P,LP);

                IF INCH=CHR(27) THEN
                 CONTINUE:=FALSE;
                 PRINTERON;
                 FOR S:=1 TO HP DO
                   BEGIN
                     WRITE(CHR(LP))
                   END;
                 PRINTEROFF
  END;
```

```
                PRINTERON;
                WRITELN;
                Y:=Y-B;
              END;

          SETLINEFEED(100);
           WRITELN(CHR(7));
          RESETPRINTER;
         PRINTEROFF;
  END;

PROCEDURE DUMP1;{time:about 1.5 min.:use SHAPE:0.83 as CONST}

  BEGIN
    DUMP(2,1,13)
  END;
```



```
PROCEDURE DUMP2;{time:about 2 min.:use SHAPE 0.671}

  BEGIN
    DUMP(3,2,24)
  END;


PROCEDURE DUMP3;{time:about 2.5 min.:use SHAPE 0.9}

  BEGIN
    DUMP(4,2,24)
  END;


PROCEDURE DUMP4;{time:about 3 min.:use SHAPE 1.09}

  BEGIN
    DUMP(5,2,25)
  END;
```

View Letters TO THE EDITOR point

Let's begin this month with the names of members who would like to contact other Memotech users in their area.

Mr. Alan Wilson, 93 Campbell Ave, Stevenston, Ayrshire, KA40 4BT.

Mr.D. Robinson, 95 Pilgrim Ave, Immingham, Grimsby, South Humberside, DN40 1DJ.

Richard Franks has some software to sell:-

For 2.50 each: Qogo, Snappo, Goldmine

For 3.50 each: Pot Hole Pete, Chess, Reversi

and for 4.50 each: Maths 1 and Physics 1 (or 7.00 for both)

Richard will also consider swapping for other programs. He can be contacted at:-

Marvins Farm, West Bourton Road, Bourton, Gillingham, Dorset, SP8 5PG.

Mr. Dennis from Watford has some useful advice for members having difficulties connecting their Miracle WS 2000 modem to the Memotech:-

The correct connection to the Memotech is not at all obvious, and after some confusion finally gained success with the following:-

MIRACLE MODEM PIN NO		MTX RS232-0 PIN NO
2	to	3
3	to	2
5	to	20
7	to	7
20	to	5

It must be noted that if pin 20 (DTR) on the Modem is used, then the default setting from the Baud 0,... command is the inverse of that required and must be taken HIGH by writing to register 5 of the DART.

```
eg.     OUT (14),5
        OUT (14),232        from Basic

or      LD A,5
        OUT (14),A
        LD A,232
        OUT (14),A          from machine code.
```

The BAUD command setting is of course for 8 bits, 2 stop bits, No parity at default setting. Also, when any mode switch changes are made, pin 20 must be pulsed low to reset the Modem internal hardware.

Recently, we have had many members enquiring how to set the BAUD rate of the RS232 from machine code. This is quite a simple process and is shown below. This example sets RS232 channel 0 to 300 baud:-

```
        LD DE,BAUD
        CALL #0D38
        RET

BAUD:DB "0,300",255
```

changing the values at the label BAUD allow adjustment of the channel and speed. For instance, this changing the BAUD line to read

```
BAUD:DB "1,1200",255
```

sets channel 1 to operate at 1200 baud.

Mr. Fox from Leeds has a comment for Memotech.

I am writing to voice my displeasure in the way Memotech advertise their goods.

I recently purchased the Hisoft Pascal Rom to assist me with my studies. Unfortunately, I own an MTX 500 and the ROM is incompatable. Why don't the adverts state this, or is it and easy way of getting more money from the customer. Some of course will say "Should have asked", but why should it be necessary, a ROM package shouldn't infringe much, if at all, on the user memory and hence would expect it to be compatable with both machines; most software is.

This is written as a warning to other users, about misleading advertising. In future I shall check total compatabililty before purchase, even though it shouldn't be necessary. It would be interesting to hear if anyone else has been caught in this trap.

Dr.B. Haughton has replied to Mr. Harrisons problem.

Shortly after I bought my computer a little over two years ago (it is one of the earliest production models) I noted a similar effect to that described by Mr. Harrison. I have sufficient background in Electronic Engineering (amateur!) to have identified this as a computer-generated oddity, and to have ignored it (I was using a B & W TV) until the PAL Video Controller Board burned itself out, and was replaced by the Company.

After about another 18 months the same effect recurred, this time ringing various intellectual bells. I therefore removed the video controller sub-assembly, sprayed it with anti-static fluid, brushed and dried it as described below and replaced it. The system has functioned quite normally for the last three weeks (it will probably blow up now, just to spite me!).

I think the following observations may therefore be useful:

1. The ASTEC video modulator, now standard on home computers is factory pre-aligned. Its output frequency is chosen to be interference free and can be changed to a limited extent, but one should not do so without access to the rather special test-equipment needed to revers one's efforts.

2. I doubt whether is getting adjacent channel interference as this usually takes the form of an overall patterning and, as far as I am aware (without a current copy of the W.R.T-V Handbook) there are no adjacent channels. If he is getting Image Interference or Breakthrough then there is something wrong with his Telly (unlikely:he says it normally works well).

3. Computer U.H.F. outputs are rather unlike normal T.V. signals. Some T.V. sets handle them well and some badly, regardless of what they do to VTR signals.

4. Some T.V. sets, particularly the older and cheaper models frequently wished upon the home computer enthusiast, are very sensitive to local interference particularly from the computer itself.

I therefore have the following suggestions:-

1. Try a test-run in the early hours of the morning when there is no local TV radiation.
2. Try another TV set.
3. Have a trial-run in a different part of the building.
4. Check all connections to elimiate the possibility of Mains-borne or Earth-loop interference.
If all else fails, then clean the PAL video board (I know it's new;it may have got dirty in the factory!)

This leads me to the following recommendations. They are standard in electronics laboratories, but are usually ignored at home because television sets and tape-recorders are rather insensitive to corrosion and dirt - computer equipment and other instruments using modern digital circuitry are not.

1. Try to work in a reasonably clean enviroment.
2. Keep a dust-cover on it when not in use.
3. Vacuum-clean and/or brush it from time to time.
4. Edge connectors - unless they are gold plated - corrode very quickly. After separation and reunion they should be smeared or sprayed with a commercial contact cleaner such as Servisol. Trade suppliers sell large aerosols of this (my last one lasted ten years), but you may find hobby suppliers who will sell smaller quantities. Follow the directions EXACTLY and please remember that it is electrically conductive, and should therefore be sprayed where wanted and not everywhere.
5. Spectrum - and QL - type membrain keyboards are reasonably immune to coffee and cigarette ash . MTX - BBC - IBM - DEC type keyboards (There! I've put the MTX in its proper company!) are not and are distressingly expensive to repair. (IBM even suggest that you should not smoke in the same room as their computer).
6. Printed-circuit boards that have become greasy may be cleaned with a proprietary anti-static preparation, sprayed on lightly and brushed with a small, stiff artist's brush, possibly followed by DE-IONISED water. Do not switch the equipment back on until the board is dry. Do not dry it with a hair dryer!

By the way, TRS 80, IBM and Apricot suppliers do a reasonable anti-static fluid. DON'T use tape cleaner or domestic detergents!

R.Holroyde has sent the following information:
Dear Genpat
In answer to the queries on Lords of Time:
1) In order to get the keys to the shed, you need to cross the stream.
2) You don't actually kill the dinosaur, which ever way you go round the hill, you meet one of the deadly killers, not only will they kill you but also themselves. Once this has been solved you drop onto the answer to the cavemen, (note, you don't have to kill these either).
R.HOLROYDE

VIDEO RECORDING TITLE SCREENS FROM THE MTX

1. This may be carred out simply by connecting the TV lead from the MTX to the "Aerial In" (sometimes "Ant In") socket of the video recorder.
Produce the title screen(s) and record the title(s) for the time required.
Remember to record the title for a few seconds longer than you require to allow for the noise which appears at the end of a recording, then rewind the tape slightly until you reach a perfect picture and "pause". Connect up your other signal (from camera or video recorder) to the appropriate sockets on your own video recorder and record the video film.
If your MTX program produces sound then this will be recorded as well. However, the picture quality will not be as good as that produced when using a lead from the "Monitor" socket of the MTX.

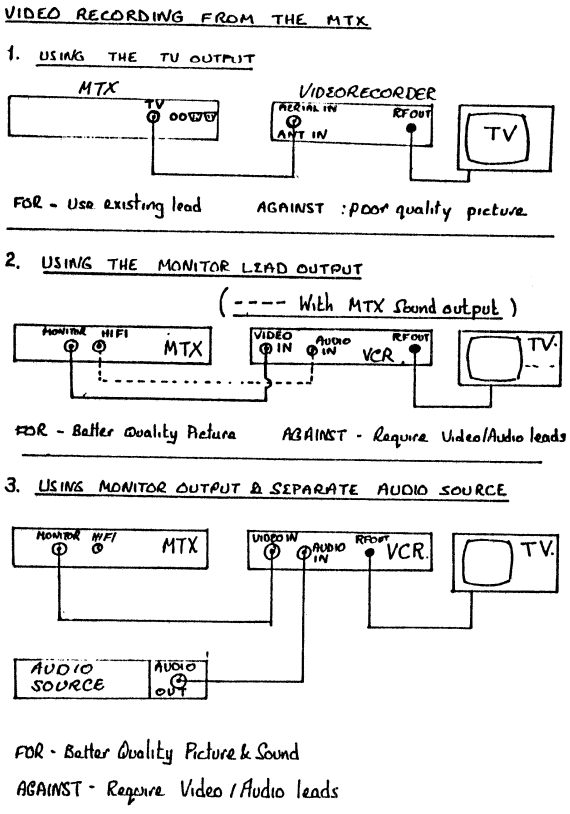
2. For this method of recording two leads are needed, one for the video signal and one for the audio signal. If no sound is being recorded then only a video lead is needed.
Connect a video lead from the "Monitor" output of the MTX (i.e. a BNC connector) to the "VIDEO IN" terminal of the video recorder,which may also be a BNC connector.

If sound is generated from the MTX then connect a lead with the appropriate jackplugs into the MTX "HI-FI" socket and the other end into the "AUDIO IN" terminal of the video recorder. Audio connectors are varied from jackplugs to DIN connectors.
(Leads may be obtained from firms which advertise in the "Exchange & Mart" etc.

If you wish to add a soundtrack to the title this may be carried out at the same time as the title is recorded or only if the video recorder has an audio dub facility at a later date.

One point worth noting is that the standard characters which are produced on screen are not reproduced clearly on videotape. It is worthwhile re-defining the ASCII characters for upper-case alphabet and numeric characters using GENPAT 0,65,.....etc. for "A"
Save the program and then run it.
Any characters input from the keyboard will be in enhanced script.

Screens may be created from Noddy pages - delete the page name from the screen first! Borders and margins can be made up from #,*,%,[,],<,>, characters or any others you define. Then program pages can be produced in Noddy to link a number of title pages together using *PAUSE's to hold the title page on screen for the required time. Bear in mind that the more information on screen the longer it should be displayed.
I hope this information explains it clearly enough. Unfortunately since I reached the above stage in producing video titles my MTX has packed up and I am awaiting repairs.
GEOFF.GAY



Special Software Exchange request -
Mr. David Lam, of 105 Geary Road, London, NW10 1HS,would like to swop his Brunword Wordprocessing Software for Memosketch on disc for the SDX system.

Mr. W. Ireland of Manchester has written in with the following comments on PASCAL:

Shared Bank Account

Bob Robinson

This program enables two persons in a household to maintain separate accounts within a single Joint (or Individual) Bank or Building Society Account. The state of the account is accessible at any time by reference to this program.

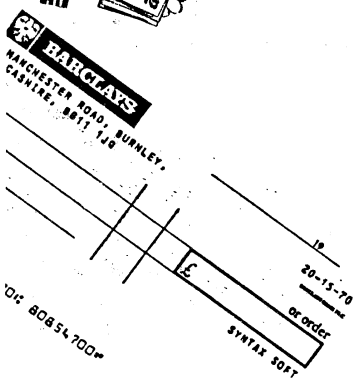
The advantages include the fact that a higher aggregate balance is maintained compared with holding two separate accounts: this reduces the likelyhood of Bank Charges or may enable a higher rate of interest to be obtained.

The account holders have the opportunity to keep a close and immediately accessible watch on their account: this is of particular use when withdrawals are due since clearance delay times for paid-in credit cheques are built into the program.

If the account is eligible for interest, this may be included at up to 5 different levels. The program adds this to the balances and provides a check that these are correctly paid. A caution is printed if the Balance falls to within Bank Charge level.

Standing Orders & Auto-credits based on Annual, Calendar Month or Weekday entries may be included, such as mortgage repayments, regular instalment payments and direct salary credits.

All withdrawals are entered at once as well as credits shown to either INDIVIDUAL Holder, but credits are not passed to the AVAILABLE Balance until the Clearance time has elapsed. 'Auto-' entries become AVAILABLE immediately.

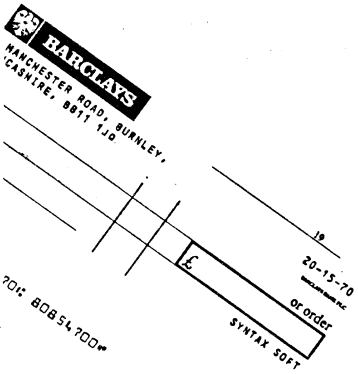


Up to 5 Reference Chrs. to identify each entry may be included and if the 1st. Ref.Chr. of a credit entry is '*' then the entry avoids Clearance delay.

TO OPERATE PROGRAM

After returning to the 'Menu' page when starting a new program, Chr.'N' is pressed. There then follows a range of questions to enable the program to be expanded to individual requirements. A summary reminder page is shown finally, followed by an entry (or (RET)) request.

Each entry is made in 2 parts: the first enters the date and up to 5 ref.Chrs. This then acts on the display to confirm the AVAILABLE Balance which actually applies to that particular date: the second part enters the Initial of the particular holder, whether a Deposit or Withdrawal is required and then the Sterling amount to be entered. By having two parts, a Withdrawal may be made with the AVAILABLE Balance shown on the display.



Although only the final few entries are shown on the Entry Display, yet all earlier entries may be recalled by pressing the 'L' in the 'Menu' page and then entering the required dates. If preferred, earlier entries may be passed to any printers which will handle at least 60 Chrs. per line (Use 'P' in the 'Menu' -- The printer used to prepare this program was a Seikosha GP-100A).

LIMITATIONS

No entries dated earlier than the latest entry may be made. If this is done erroneously, the program assumes that the entry refers to the following year and continues accordingly. Faulty entries cannot be cancelled: they must be corrected by making a further complementary entry (or re-Load).

The Maximum Sterling capacity before printing errors occur is 8 numerical Chrs. i.e., 99999999 or 99999.99.

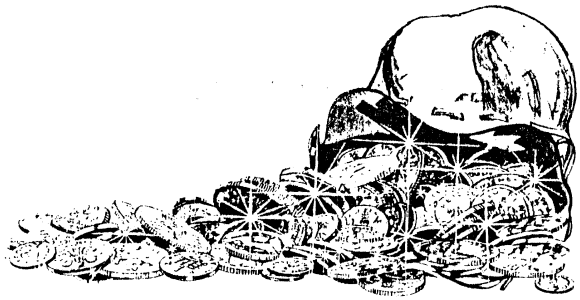
The maximum capacity of the file is about 500 entries for the MTX512 provided there are no interest payments nor 'Auto-' entries. It will easily cope with 400 entries with a reasonable addition of interest payments and 'Auto-'s. In this program the capacity is set at 200 (Line 1450,where 'K'=200+4).

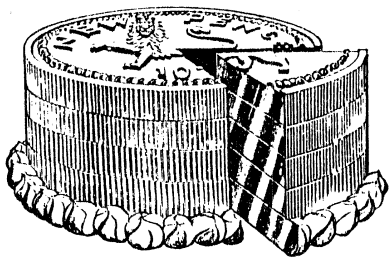
It is of course essential to ensure that all 'non-Auto' entries made to the Holder's actual bank account are exactly duplicated by entry into this computer program if it is to be of realistic value. This means that all cheques made out by either individual and any non-Auto paying-in slips must also be entered into the program.

Execution of this program is rather slow but the flashing cursor must be awaited. Very occasionally the program 'sticks': in this case, the Memotech Gong sounds, and (RET) must be pressed for the program to continue without any ill-effect. ★

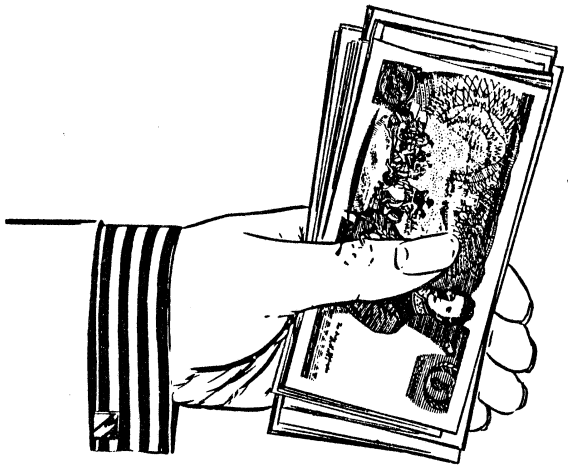
```
10 REM ### 'SHARED BANK ACCOUNT' ###       ### MEMOTECH MTX512 (Aug.1985)###    ### [R.R.ROBINSON, BRIGHTON] ###
20 REM                                 #####       Enter: 'GOTO 10'     ####       ['RUN' will lose the account]
30 REM
40 REM
50 REM ## START ## (ALSO FROM 2410) ##
60 PRINT CHR$(27);"B1"
70 VS 5: CLS : GOTO 1160
80 REM ## (FROM 1370) ###
90 CLEAR : RESTORE 1560
100 GOTO 1060
110 REM # DAY COUNTER, ENTRY SORTING,  CLEARANCE DELAY & DISPLAY (FROM 2080) #
120 LET P=P+1: LET PP=PP+1
130 FOR H=N TO Q
140 IF A(H)=0 THEN  GOTO 240
150 IF P<)(4(H)+CLL) THEN  GOTO 240
160 IF B$(H,11)="F" THEN  GOTO 240
170 IF B$(H,1)="W" THEN  GOTO 230
180 LET G3=VAL(B$(H,3,8))
190 LET B3=B3+G3
200 LET B3=INT(B3$100+SGN(B3)$0.49+/100
210 CSR 0,21: PRINT " ;     ;JNT.;  ;        ;  ;";LEFT$(STR$(B3),9): CSR 38,21: PRINT ";"
220 CSR 0,23: PRINT
230 LET B$(H,11)="F"
240 NEXT H
250 LET B5=B3
260 IF ONT$(>"0" THEN  GOSUB 300
270 GOSUB 500
280 IF P<I THEN  GOTO 110
290 RETURN : REM ## (TO 2080) ###
300 REM  ## INTEREST CALCULATION AND    ACCUMULATION ## (FROM 260) ##
310 IF P3=P THEN  RETURN
320 LET P3=P
330 IF B1=0 AND B2=0 THEN  LET B1=0.0001
340 IF B1+B2<CAP(1) THEN  LET RR=LEV(1): GOTO 390
350 IF B1+B2<CAP(2) THEN  LET RR=LEV(2): GOTO 390
360 IF B1+B2<CAP(3) THEN  LET RR=LEV(3): GOTO 390
370 IF B1+B2<CAP(4) THEN  LET RR=LEV(4): GOTO 390
380 IF B1+B2<CAP(5) THEN  LET RR=LEV(5)
390 IF I6=0 THEN  LET INT3=(B1+B2)$RR$.01/(365+LP2)
400 IF I6=1 THEN  LET INT3=B3$RR$.01/(365+LP2)
410 LET BB3=BB3+INT3
420 LET BB1=BB1+INT3$B1/(B1+B2)
430 LET BB2=BB2+INT3$B2/(B1+B2)
440 FOR X=1 TO N4
450 IF LP2=0 THEN  LET O$=PIN$(X,6,3) ELSE  LET O$=PIN$(X,9,3)
460 LET NB=VAL(O$)+VAL(PIN$(X,1,2))
470 IF LEFT$(STR$(PP/(365+LP2)),7)=LEFT$(STR$((NB/(365+LP2))),7) THEN  GOSUB 5370
480 NEXT X
490 RETURN
```

```
500 REM ** COUNTING & SELECTING FOR       'AUTO-' ENTRIES ** (FROM 270,          7330,7560) **
510 IF LP2=0 THEN  GOTO 530
520 FOR X=1 TO 13: LET MO$(X)=MOL$(X): NEXT X: GOTO 550
530 FOR X=1 TO 13: LET MO$(X)=MON$(X): NEXT X
540 IF P2=P THEN  RETURN
550 LET P2=P
560 IF P<VAL(MO$((MONU),4,3)) THEN  RETURN
570 IF NM<>0 THEN  GOSUB 650
580 IF NA<>0 THEN  GOSUB 740
590 IF NW<>0 THEN  GOSUB 850
600 IF PP=VAL(MO$((MONU+Y1+1),4,3)) THEN  LET Y1=Y1+1
610 IF PP=365+LP2 THEN  LET Y1=1-MONU
620 IF PP/(365+LP2)=INT(PP/(365+LP2)) THEN  LET PP=PP-(365+LP2): LET YR=YR+1
630 IF YR/4=INT(YR/4) THEN  LET LP2=1 ELSE  LET LP2=0
640 RETURN
650 REM * MONTHLY SELECTIONS(FROM 570)
660 FOR X=1 TO NM
670 IF PP<>VAL(MS$(X,1,2))+VAL(MO$((MONU+Y1),4,3)) THEN  GOTO 720
680 LET AD$=MS$(X,1,2)+MO$((MONU+Y1),1,3): LET ID$=MS$(X,3,1): LET PER$=MS$(X,4,1): LET AUB=VAL(MS$(X,5,8)): LET REF$=MS$(X,13,5)
690 IF PER$=NM$(1) THEN  LET PER$=NM$
700 IF PER$=NA$(1) THEN  LET PER$=NA$
710 GOSUB 8240
720 NEXT X
730 RETURN
740 REM * ANNUAL SELECTIONS(FROM 580) *
750 FOR X=1 TO NA
760 IF LP2=0 THEN  LET AST$=AS$(X,16,3)
770 IF LP2=1 THEN  LET AST$=AS$(X,19,3)
780 IF PP<>VAL(AS$(X,1,2))+VAL(AST$) THEN  GOTO 830
790 LET AD$=AS$(X,1,5): LET ID$=AS$(X,6,1): LET PER$=AS$(X,7,1): LET REF$=AS$(X,22,5): LET AUB=VAL(AS$(X,8,8))
800 IF PER$=NM$(1) THEN  LET PER$=NM$
810 IF PER$=NA$(1) THEN  LET PER$=NA$
820 GOSUB 8240
830 NEXT X
840 RETURN
850 REM * WEEKLY & MULTI-WEEKLY          SELECTIONS (FROM 590) **
860 FOR X=1 TO NW
870 IF P<VAL(WS$(X,1,2))+VAL(STMON$(4,3)) THEN  GOTO 1040
880 LET Z=(P-VAL(WS$(X,1,2))-VAL(STMON$(4,3)))/(7*VAL(WS$(X,13,2)))
890 IF Z<>INT(Z) THEN  GOTO 1040
900 REM ** CALCULATE WEEKLY PRINT         DISPLAY  **
910 FOR Y=1 TO 13
920 IF LP2=1 THEN  GOTO 950
930 IF PP<=VAL(MON$(Y,4,3)) THEN  GOTO 970
940 IF LP2=0 THEN  GOTO 960
950 IF PP<=VAL(MOL$(Y,4,3)) THEN  GOTO 970
960 NEXT Y
970 IF LP2=0 THEN  LET O$=MON$(Y-1) ELSE  LET O$=MOL$(Y-1)
980 LET AD$=STR$(PP-VAL(O$(4,3))): LET AD$=RIGHT$(AD$,LEN (AD$)-1): IF LEN (AD$)=1 THEN  LET AD$="0"+AD$
990 LET AD$=AD$+O$(1,3)
1000 LET ID$=WS$(X,3,1): LET PER$=WS$(X,4,1): LET AUB=VAL(WS$(X,5,8)): LET REF$=WS$(X,15,5)
1010 IF PER$=NM$(1) THEN  LET PER$=NM$
1020 IF PER$=NA$(1) THEN  LET PER$=NA$
1030 GOSUB 8240
1040 NEXT X
1050 RETURN : REM ** (TO 270) **
1060 CLS : CSR 12,0: PRINT "ENTRY OF NAMES": CSR 12,1: PRINT "--------------"
1070 CSR 2,4: PRINT "Enter name of Finance Organisation tovhich the Present Account refers (not  more than 20 characters):"
1080 CSR 18,8: INPUT COMP$: IF LEN (COMP$)>20 THEN  GOTO 1060
1090 IF LEN (COMP$)=20 THEN  GOTO 1140
1100 FOR X=LEN (COMP$) TO 19
1110 IF X=18 OR X=19 THEN  LET COMP$=CHR$(32)+COMP$: GOTO 1130
1120 IF X/2=INT(X/2) THEN  LET COMP$=COMP$+CHR$(32) ELSE  LET COMP$=CHR$(32)+COMP$
1130 NEXT X
1140 CSR 17,9: PRINT ")"+COMP$
1150 GOTO 1400
1160 REM * 'MENU' PAGE (FROM 70,1900,    2960,2970,3350,3360,4280,4730,5120) *
1170 VS 5: CLS
1180 PRINT "   This Programme accepts and stores   entries in two separate parts of a    Single Shared Account: only the final 7entries (approximately)";
1190 PRINT " are displayed  at a time."
1200 PRINT
1210 PRINT "PRESS",,"    OBJECT": PRINT
1220 PRINT "  A","   OBSERVE or ADD to existing              account."
1230 PRINT "  L","   LIST earlier entries."
1240 PRINT : PRINT "  P","   PRINT-OUT (Connect Printer)."
1250 PRINT : PRINT "  S","   SAVE programme (Do not Start            tape)."
1260 PRINT "  C","   CHANGE or Review Values of              Auto-Payments & Int.rates."
1270 PRINT "  I","   Introductory summary."
1280 PRINT : PRINT : PRINT " (N)","   Start NEW account-"
1290 PRINT ,"    CAUTION, ENTRIES ARE LOST."
1300 LET K$=INKEY$
1310 IF K$="A" THEN  GOTO 5700
1320 IF K$="S" THEN  GOTO 8470
1330 IF K$="L" THEN  GOTO 4160
1340 IF K$="P" THEN  GOTO 4160
1350 IF K$="C" THEN  GOTO 7820
1360 IF K$="I" THEN  GOTO 2390
1370 IF K$="N" THEN  GOTO 90
1380 GOTO 1300
1390 REM ** ALTER VALUE OF 'K' (LINE       1410)  TO ALLOCATE MAXIMUM NUMBER OF   ENTRIES ****
1400 REM **** (FROM 1150) ******
1410 LET K=204
1420 DIM A(K)
1430 DIM B$(K,11)
1440 DIM C$(K,10)
1450 DIM J$(K,10)
1460 DIM R$(1,10)
1470 DIM L(K)
1480 DIM M(K)
1490 LET PP=0: LET BB1=0: LET BB2=0: LET BB3=0
1500 LET AUB1=0: LET AUB2=0: LET AUB3=0
1510 LET AD$="": LET ID$="": LET PER$="": LET REF$=""
1520 DIM DATE$(30,15): DIM RATE(30,5): DIM RATE$(5,5): DIM LEV(5): LET ZZ=1
1530 DIM CAP(5): DIM CAP$(5,5): DIM DIS$(5,5)
1540 DIM MO$(13,6): DIM MON$(13,6): DIM MOL$(13,6)
1550 FOR X=1 TO 13: READ MON$(X): READ MOL$(X): NEXT
1560 DATA JAN0,JAN0,FEB31,FEB31,MAR59,MAR60,APR90,APR91,MAY120,MAY121,JUN151,JUN152,JUL181,JUL182,AUG212,AUG213,SEP243,SEP244
1570 DATA OCT273,OCT274,NOV304,NOV305,DEC334,DEC335,XXX365,XXX366
1580 GOTO 1650
1590 REM * EVAL. OF DAY NO. IN YEAR       (FROM 6900,7520)  **
1600 FOR Y=1 TO 13
1610 IF O$=MON$(Y,1,3) THEN  LET P$=MON$(Y,4,3)
1620 IF O$=MOL$(Y,1,3) THEN  LET Q$=MOL$(Y,4,3)
1630 NEXT Y
1640 RETURN
1650 LET E=2
1660 LET I2=0
1670 LET P=0: LET P1=0: LET P2=0: LET P3=0: LET Y1=0
1680 LET I4=0: LET I5=0
1690 LET I=0: LET II=0: LET L=0: LET PREL=0
1700 LET N=3
1710 LET Q=2
1720 LET G1=0: LET G2=0
1730 LET A(1)=0: LET A(2)=0: LET AN=0
1740 LET NA=0: LET NM=0: LET NW=0
1750 LET B1=0: LET B2=0: LET B3=0: LET B4=3
1760 LET K$="": LET SP$="0": LET ONT$="0": LET AP$="0"
1770 LET H$="H": LET HH$="HH": LET XX=0: LET XXX=0
1780 GOTO 2510
1790 CLS
1800 GOSUB 5210
1810 GOSUB 6040
1820 REM ** (FROM 1950,1970,1990) **
1830 GOSUB 5990
1840 LET R$(1)="          "
1850 GOSUB 3950: GOSUB 4020
1860 REM * INPUT DATE & NOT ) 5 REF.      CHRS. ** (FROM 2380,2500,5970) ****
1870 CSR 0,23
1880 IF Q=K-1 THEN  GOTO 5130
1890 INPUT O$
1900 IF O$="" THEN  GOTO 1160
1910 LET TEMP$=LEFT$(O$,10): LET O$=TEMP$
1920 CSR 0,22: PRINT "                    "
1930 LET R$(1)=O$
1940 LET X1=ASC(R$(1,1))
```





```
1950 IF X1<48 OR X1>57 THEN  GOTO 1820
1960 LET X1=ASC(R$(1,2))
1970 IF X1<48 OR X1>57 THEN  GOTO 1820
1980 IF R$(1,3,3)="JAN" OR R$(1,3,3)="FEB" OR R$(1,3,3)="MAR" OR R$(1,3,3)="APR" OR R$(1,3,3)="MAY" OR R$(1,3,3)="JUN" THEN  GOTO 2010
1990 IF R$(1,3,3)<>"JUL" AND R$(1,3,3)<>"AUG" AND R$(1,3,3)<>"SEP" AND R$(1,3,3)<>"OCT" AND R$(1,3,3)<>"NOV" AND R$(1,3,3)<>"DEC" THEN  GOTO 1820
2000 REM ## (FROM 3540,3550) ##
2010 LET FL=0: GOSUB 3440
2020 LET Q=Q+1
2030 LET A(Q)=I
2040 IF A(Q-1)-A(Q-2)>CL+2 THEN  LET N=Q-2
2050 IF A(Q)=A(Q-1) THEN  LET P=P-1: LET PP=PP-1
2060 LET P$=R$(I)
2070 LET R$(I)="          "
2080 GOSUB 110
2090 LET R$(I)="          "
2100 LET R$(I)=P$
2110 CSR 2,21: PRINT R$(1,1,5)
2120 CSR 2,22: PRINT R$(1,6,5)
2130 GOSUB 4100: GOSUB 4020: GOSUB 5990
2140 CSR 0,23
2150 REM ## INPUT STERLING ENTRY ##
2160 INPUT F$,FF$
2170 IF F$="" THEN  GOTO 2160
2180 LET TEMP$=STR$((INT(VAL(RIGHT$(F$,(LEN (F$))-2))$100+0.49))/100)
2190 LET TEMP$=RIGHT$(TEMP$,LEN (TEMP$)-1): LET F$=F$(1)+F$(2)+TEMP$
2200 IF LEN (F$)>10 THEN  CSR 0,22: PRINT "TOO MANY NUMERALS! OMIT THE PENCE?"
2210 IF LEN (F$)>10 THEN  PAUSE 3000: CSR 0,22: PRINT "                              ": GOTO 2130
2220 CSR 0,22: PRINT "                                "
2230 IF ASC(FF$)<>-1 THEN  GOTO 2130
2240 IF F$="" THEN  GOTO 2130
2250 IF F$(1)<>"C" AND F$(1)<>"W" THEN  GOTO 2130
2260 IF F$(2)<>NM$(1) AND F$(2)<>NA$(1) THEN  GOTO 2130
2270 LET X2=LEN (F$)
2280 FOR X=3 TO X2
2290 IF ASC(F$(X))<46 OR ASC(F$(X))>57 OR ASC(F$(X))=47 THEN  GOTO 2130
2300 NEXT X
2310 LET B$(Q)=F$
2320 IF R$(1,6,1)="#" AND F$(1)="C" THEN  GOTO 2420
2330 IF CL=0 AND F$(1)="C" THEN  GOTO 2420
2340 IF F$(1)="C" THEN  GOSUB 3800: GOSUB 3860
2350 IF F$(1)="W" THEN  GOSUB 3610
2360 GOSUB 3950: GOSUB 4020
2370 LET R$(1)="          "
2380 GOTO 1860
2390 REM ### INSTRUCTIONS IN NODDY ####        ### (FROM 1360) ###
2400 PLOD "INTRO"
2410 GOTO 10
2420 REM ## (FROM 2320,2330) ####
2430 LET B$(Q,1)="F"
2440 GOSUB 3800
2450 IF F$(2)=NM$(1) THEN  LET B3=B3+61
2460 IF F$(2)=NA$(1) THEN  LET B3=B3+62
2470 GOSUB 3860
2480 GOSUB 3950: GOSUB 4020
2490 LET R$(1)="          "
2500 GOTO 1860
2510 REM  ## (FROM 1780) ##
2520 PRINT : PRINT
2530 PRINT " Enter the two names of the account  holders: use not more than 4 letters  for each and ensure that the initial  letter of each is ";
2540 PRINT "different.(If they  must be the same, use lower case for  one throughout programme)"
2550 CSR 3,18: INPUT "Enter first name:  ";NM$
2560 LET NM$=LEFT$(NM$,4): IF LEN (NM$)=4 THEN  GOTO 2580
2570 FOR X=LEN (NM$) TO 3: LET NM$=NM$+CHR$(32): NEXT X
2580 CSR 22,19: PRINT NM$
2590 CSR 3,21: INPUT "Enter second name: ";NA$: LET NA$=LEFT$(NA$,4): IF LEN (NA$)=4 THEN  GOTO 2610
2600 FOR X=LEN (NA$) TO 3: LET NA$=NA$+CHR$(32): NEXT X
```



cont_ _ _ _ _

SOFTWARE

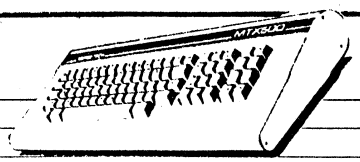
00106	26X26 SPREAD SHEET	UTIL	SYNT	7.95	I ANY
00057	3D TACHYON FIGHTER	ARC	CONT	6.95	I ANY
00062	ADVENTURE QUEST	ADV	LVL9	8.75	I ANY
00033	AGROVATOR	ARC	SYNT	5.95	I 512
00125	AIRCRAFT MAGNETISM	FLGT	AVTN	?	I ANY
00120	AIRCRAFT PAYLOADS	FLGT	AVTN	?	I ANY
00122	AIRLAW 2	FLGT	AVTN	?	I ANY
00123	AIRSPEED INDICATOR	FLGT	AVTN	?	I ANY
00071	ALICE IN WONDER.	ADV	CONT	6.02	I ANY
00121	ALTIMETER	FLGT	AVTN	?	I ANY
00008	ASTROMILON	ARC	CONT	6.02	I ANY
00047	ASTROPAC	ARC	CONT	6.02	I ANY
00058	BACKGAMMON	BRD	CONT	7.95	I ANY
00041	BASIC BUSINESS	BS	CONT	5.95	I ANY
00043	BLOBBO	ARC	CONT	6.02	I ANY
00073	BOUNCING BILL	ARC	SYNT	4.95	I ANY
00074	BRIDGE	CARD	CONT	6.95	I 512
00077	CANVAS	UTIL	CONT	7.95	I ANY
00085	CAVES OF ORB	ADV	SYNT	5.95	I 512
00094	CHAMBEROIDS	ARC	MEGA	5.95	I ANY
00059	CHESS	BRD	CONT	8.75	I ANY
00053	COBRA	ARC	CONT	6.02	I ANY
00025	COLOSSAL ADVENTURE	ADV	LVL9	8.75	I ANY
00098	COMBAT	ARC	PANS	2.95	I 512
00028	COMPOSER	UTIL	XAV	13.00	I ANY
00046	CONT RAIDERS	ARC	CONT	6.02	I ANY
00099	CRIBBAGE	CARD	SCRP	2.95	E ANY
00110	CRYSTAL	ARC	MEGA	5.95	I ANY
00050	DEN.GOES BANANAS	ARC	SCRP	2.95	I ANY
00011	DENNIS & CHICKEN	ARC	SCRP	2.95	I ANY
00103	DENNIS AND CIRCUS	ARC	SCRP	2.95	I ANY
00068	DOODLEBUG	ARC	SYNT	4.95	I ANY
00108	DOWNSTREAM DANGER	ARC	MEGA	5.95	I ANY
00096	DR. FRANKIE	ARC	SYNT	5.95	I 512
00056	DRAUGHTS	BRD	CONT	6.95	I ANY
00111	DRIVE THE CEE 5	ARC	MEGA	5.95	I ANY
00063	DUNGEON ADVENTURE	ADV	LVL9	8.75	I ANY
00067	EDASM	UTIL	SYNT	7.95	I 512
00066	EMERALD ISLE	ADV	LVL9	5.95	I ANY
00038	ESCAPE FROM ZARKOS	ARC	MEGA	5.95	I ANY
00081	EXTENDED BASIC	6.95	SENT	6.95	I ANY
00082	FATHOMS DEEP	ARC	MEGA	5.95	I ANY
00090	FIG FORTH	LANG	SYNT	15.75	I 512
00055	FIREHOUSE FREDDIE	ARC	CONT	6.02	I ANY
00021	FIRST LETTERS 1	EDUC	CONT	8.75	I ANY
00092	FKEY DEFINER	UTIL	MEMB	6.95	I ANY
00037	FLUMMOX	ARC	SYNT	5.95	I 512
00052	GAUNTLET	ARC	CONT	6.02	U ANY
00102	GHOSTLY CASTLE	ADV	PANS	2.95	I ANY
00031	GOLDMINE	ARC	CONT	6.02	I ANY
00069	GRAPHICS	UTIL	CONT	5.95	I ANY
00087	H & L DUMP	UTIL	MEM	4.95	I ANY
00072	HAWKWARS	ARC	SYNT	4.95	I ANY
00065	HELI-MATHS	EDUC	CONT	5.95	I ANY
00034	HUNCHY	ARC	SYNT	4.95	I ANY
00083	ICEBERG	ARC	SYNT	4.95	I ANY
00105	JET SET WILLY	ARC	SPRJ	6.95	E ANY
00015	JOHNNY REB	WAR	LOTH	6.02	I ANY
00097	JUMPING JACK FLASH	ARC	SYNT	5.95	I 512
00115	KARATE KING	ARC	MEGA	5.95	I ANY
00016	KEY TO TIME	ADV	LUMP	6.02	I ANY
00042	KILOPEDE	ARC	CONT	6.02	I ANY
00019	KNUCKLES	ARC	CONT	7.95	I ANY
00078	LES FLICS	ARC	PSS	6.95	E ANY
00032	LITTLE DEVILS	ARC	SYNT	4.95	I ANY
00024	LORDS OF TIME	ADV	LVL9	8.75	I ANY
00035	M COMMAND & ARCAD.	ARC	SYNT	4.95	I ANY
00070	MAN FROM GRANNY	ADV	SYNT	4.95	I 512
00104	MANIC MINER	ARC	SPRJ	6.95	E ANY
00119	MAPS AND CHARTS	FLGT	AVTN	?	I ANY
00126	MAPS AND CHARTS 1	FLGT	AVTN	?	I ANY
00022	MATHS 1	EDUC	CONT	8.75	I ANY
00013	MAXIMA	ARC	CONT	6.02	E ANY
00086	MEMOCHEQUE	UTIL	SYNT	6.95	I ANY
00075	MEMOSKETCH	UTIL	SYNT	7.95	I ANY
00089	MINER DICK	ARC	XAV	6.95	I ANY
00044	MISSION ALPHATRON	ARC	CONT	6.02	I ANY
00030	MISSION OMEGA	ARC	SYNT	4.95	I ANY
00054	MURDER AT MANOR	ADV	LUMP	6.02	I ANY
00010	MUSIC PAD	UTIL	CONT	6.02	I ANY
00003	NEMO	ARC	CONT	6.00	I ANY
00112	OBLITERATION ZONE	ARC	MEGA	5.95	I ANY
00045	OBLOIDS	ARC	CONT	6.02	I ANY
00129	PAINTBOX	UTIL	SYNT	5.95	I ANY
00001	PAYROLL	UTIL	CONT	21.25	I 512
00005	PHAID	ARC	CONT	6.02	I ANY
00061	PHYSICS 1	EDUC	CONT	8.75	I ANY
00124	PILOT NAVIGATION	FLGT	AVTN	?	I ANY
00012	PONT & BLACKJACK	CARD	CONT	6.02	I ANY
00009	POT HOLE PETE	ARC	CONT	6.02	I ANY
00040	PURCHASE LEDGER	BN	CONT	12.75	I 512
00048	QOGO	ARC	CONT	6.02	I ANY
00076	QOGO 2	ARC	MEGA	5.95	I ANY
00095	QUANTUM	ARC	SYNT	5.95	I ANY
00109	QUAZZIA	ARC	MEGA	5.95	I ANY
00107	RED MOON	ADV	LVL9	?	U ANY
00127	RELATIVE VELOCITY	FLGT	AVTN	?	I ANY
00064	RETURN TO EDEN	ADV	LVL9	8.75	I ANY
00020	REVERSI	BRD	CONT	7.95	I ANY
00114	ROLLA BEARING	ARC	MEGA	5.95	I 512
00100	RUTHLESS BASTARD	ARC	LSFT	2.50	I 512
00002	SALES LEDGER	UTIL	SYNT	15.75	I 512
00029	SALTY SAM	ARC	SYNT	4.95	I ANY
00113	SEPULCRI SCELERATI	ARC	MEGA	5.95	I 512
00101	SLOOPY'S CHRISTMAS	ARC	PANS	2.95	I ANY
00116	SMG	ARC	MEGA	5.95	I ANY
00049	SNAPPO	ARC	CONT	6.02	I ANY
00023	SNOWBALL	ADV	LVL9	8.75	I ANY
00036	SON OF PETE	ARC	MEGA	5.95	I ANY
00026	SPELLI-COPTER	EDV	CONT	5.95	I ANY
00080	SPOOLER	UTIL	MEM	4.95	I ANY
00017	STAR COMMAND	ARC	CONT	6.95	I ANY
00014	SUPA CODER	UTIL	SYNT	7.95	I ANY
00084	SUPER BIKE	ARC	SYNT	4.95	I ANY
00004	SUPER MINEFIELD	ARC	CONT	6.02	I ANY
00093	SURFACE SCANNER	ARC	MEGA	5.95	I ANY
00039	TAPE TO DISC	UTIL	MEM	6.95	I ANY
00007	TAPEWORM	ARC	CONT	6.02	I ANY
00088	TARGET ZONE	ARC	SYNT	6.95	I ANY
00118	THE DESIGNER	UTIL	HALT	8.95	I ANY
00128	THE WALL	ARC	SYNT	4.95	I 512
00051	THE ZOO GAME	ADV	CONT	6.02	I 512
00006	TOADO	ARC	CONT	6.02	I ANY
00018	TURBO	ARC	CONT	6.95	I ANY
00117	USER BASIC	UTIL	SYNT	8.95	I ANY
00079	USER EXTEND	UTIL	MEM	7.95	I ANY
00027	UTILITIES 1	UTIL	CONT	4.95	I ANY
00091	VERNON & VAMPIRES	ARC	SYNT	5.95	I ANY
00060	WORD & PICTURE	EDUC	CONT	8.75	I ANY

PLEASE ONLY ORDER THOSE MARKED " I "

KEY:- STOCK NUMBER TITLE TYPE HOUSE MEMBER PRICE STOCK MACHINE

E=EXPECTED SOON I = IN STOCK U = UNAVAILABLE AT PRESENT

HARDWARE



PRICES EFFECTIVE FROM 1ST DECEMBER 1985

MTX 512 ..... #119.00 MEMBERSHIP EXTRA
MTX 500 ..... # 69.95 MEMBERSHIP EXTRA

32K MEMORY EXPANSION .....#36.74
64K MEMORY EXPANSION ..... #45.43
128K MEMORY EXPANSION ..... #69.52
**** PLEASE STATE FOR WHICH MODEL ******

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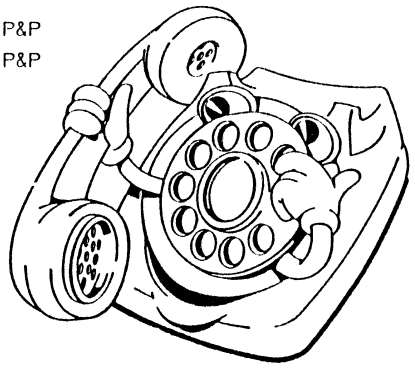

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