THE
MEMOTECH OWNERS CLUB
MAGAZINE

FEATURES :-

BASIC VIA ASSEMBLER

PASCAL MUSIC

ASSEMBLER DIVIDE

CIRCA ...246

M.O.C.

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E D I T O R I A L   (November 1985)

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Today I read an absolutely classic phrase, it was not directed at the home computer market but at the small business user, it went like this:-

"There is nothing in this world that someone cannot make or sell a little more cheaply, and he who buys on price alone is that mans victim"

I wonder how many such victims there are about, I should imagine well in excess of 100,000. The computer industries destruction due to it's continual price dropping is so sad to see, as I firmly believe that an honest hobbyest is always prepared to pay a fair price for his tools.

Onto some good points, the formation of a Swiss/German user group is very interesting, we have been corresponding now for a few weeks and we have come to an agreement whereby we let them have our program library material and they will start up a library at their end and let us have their programs as they become available.

Also some new software available from Aviaton Software, although we have to reluctently point out that although there seems to be quite a few titles available, we had severe loading problems and the quality really was not up to commercial standards. So much so that reviews of two items that we had, we have scrapped. We do not wish to offend anyone by saying that, but, really the truth as we see it is all we can put forward.

The winner of this months prize draw is :-

Dave Thompson, who will receive a copy of Dr Franky for his Pascal article. ...Ed->Is that the second time Dave?

   ...remember all you have to do to be included in this free draw is have something published in the magazine.

Thanks to everyone who has used our Hotline on Monday evenings between 6 & 7pm, remember we always look forward to hearing from you, the number to phone is Bursledon (042121) 5489. Ask for Rich!

If anyone would like back issues they are available for all past magazines for the small remittance of 80p.

It should be noted that all articles are the copyright of the sender and M.O.C., anyone wishing to have articles published elsewhere should inform us first.

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L BASIC PART V
DELETE ROUTINE

This month there is no errata, so hopefully everyone is happy with all the routines published so far. This month I've written a DELETE data routine to cover option 5 from the Main Menu. When giving this routine some thought I came up with several ideas, most of which revolved around making up several more variables which I did not think was a good policy as I was trying to keep it all simple. Also, another problem I had to overcome was the differences in ways the data is saved, as some have the Data Save/Load and others have only got the ordinary SAVE command. I have managed to get away with only making one extra variable called DUMMY, which will hold the number of the most recent record deleted.

So, this is the method I finally chose. The routine will obviously only allow you the option of deleting, providing the file FILE$ contains some records. So, assuming you have say, 30 records, calling the delete option will display the first 20 records on to the screen, they are numbered in the left-most columns. Due to the screen only being 40 (39) columns wide only the first two fields are displayed, this should be sufficient to decide which records to delete. At the bottom of the screen you are prompted to enter the number of the record to delete, enter as many as you like, one at a time, pressing 0 will, in this case with 30 records, display the remaining 10 records to allow you the option of deleting. Pressing 'x' at any stage will return you to the main menu.

Now what does the deleting do? I have chosen to delete the record completely, replacing field 1 with 5 asterisks to denote a deleted record. Now for the complicated bit, so that I can keep a trace of the records which have been deleted I have made a dummy variable, called DUMMY. This will hold the number of the most recent record deleted. When the next record is deleted DUMMY is placed in Field 2 and then the number of the most recent record deleted is placed in DUMMY. Thus, dummy always holds the most recent record deleted and field 2 of that record points to the next deleted record. I hope you can understand that, as it has a fair importance in that the ADD MORE DATA routine will require to know exactly where spare records are, so that it can fill them before extending the length of FILE$.

If anyone would like a listing of the program so far then please send in a S.A.E large enough for 5 sheets of computer paper.

Updates and improvements are also most welcome.

Next month ...The Amend data routine.

```
5 REM---------------------------------------------
10 REM   DBASE BY PHIL EYRES V2.0
20 REM---------------------------------------------
30 DIM FILE$(100,6,30)
40 DIM FNAME$(6,20),REC(1)
50 LET REC(1)=0: LET STORE=0: LET DUMMY=0
60 DIM FIELD(1)
70 DIM Z$(30),WORD$(1,30)


4997 REM---------------------------------------------
4998 REM DELETE RECORD
4999 REM---------------------------------------------
5000 VS 5: CLS
5010 IF REC(1)=0 THEN  CSR 12,5: PRINT "!!! FILE EMPTY !!!": PAUSE 500
0: RETURN
5020 LET CNT=0: LET COUNT=0
5030 LET CNT=CNT+1
5040 LET COUNT=COUNT+1
5050 CSR 2,CNT: PRINT CNT;FILE$(COUNT,1);FILE$(COUNT,2)
5060 IF COUNT=REC(1)-1 THEN  GOSUB 5500: RETURN
5070 IF CNT=20 THEN  GOSUB 5500 ELSE  GOTO 5030
5080 IF DEL$="X" THEN  RETURN
5085 CLS
5090 LET CNT=0: GOTO 5030
5500 REM DELETE
5510 REM
5520 CSR 20,21: PRINT "         ";
5530 CSR 3,22: PRINT "X TO RETURN";
5540 CSR 3,23: PRINT "O FOR NEXT PAGE";
5550 CSR 3,21: INPUT "REC. NO TO DELETE";DEL$
5560 IF DEL$="X" THEN  RETURN
5570 LET DEL=VAL(DEL$)
5580 IF DEL<0 OR DEL>CNT THEN  GOTO 5500
5590 IF DEL=0 THEN  RETURN
5600 LET STORE=STORE+1
5605 FOR I=1 TO FIELD(1)
5610 LET FILE$(COUNT-(CNT-DEL),I)="              "
5620 NEXT I
5630 LET FILE$(COUNT-(CNT-DEL),1)="*****"
5640 LET FILE$(COUNT-(CNT-DEL),2)=STR$(DUMMY)
5650 LET DUMMY=COUNT-(CNT-DEL)
5660 GOTO 5500
6000 RETURN

 VERSION 2 ONLY <-AMENDMENTS
2040 CSR 7,15: PRINT REC(1)-1-STORE;" FILES BEING SAVED"
2195 LET REC(1)=REC(1)-STORE
2250 FOR I=1 TO REC(1)+STORE
2265 IF LEFT$(FILE$(I,1),5)="*****" THEN  GOTO 2280

 VERSION'S 1 & 2 <-AMENDMENTS
7390 IF LEFT$(FILE$(I,1),5)<>"*****" THEN  LPRINT FILE$(I,P)
7520 IF LEFT$(FILE$(I,1),5)<>"*****" THEN  PRINT FILE$(I,P)
7680 IF LEFT$(FILE$(I,1),5)<>"*****" THEN  PRINT FILE$(I,NUM)
7730 IF LEFT$(FILE$(I,1),5)<>"*****" THEN  LPRINT FILE$(I,NUM)
7960 IF LEFT$(FILE$(I,1),5)<>"*****" THEN  PRINT FILE$(SEARCH,I)
```

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16 BIT DIVISION
USING ASSEMBLER

As a follow-on from last month's 16 bit Multiply article, here is it's 'brother', a 16 bit divide routine. It is shorter than the multiply routine and if you look closely at it, you will see that it is quite a lot simpler as well. It infact follows the basic rules for division using 'long division'.

```
;
; A routine to divide 2, 16 bit numbers
; Giving an 8 bit answer and 16 bit remainder
; By Robert Eyres
; Routine occupies 20 bytes
;
START     XOR A                   ;Clear A register
          LD HL,(IDEND)
          LD BC,(ISOR)
SUB:      SBC HL,BC
          JP M,FINI               ;Jump if REM is Negative
          INC A                   ;Else add 1 to RESult
          JP SUB                  ;Do it again
FINI:     ADD HL,BC               ;Put remainder
          LD (RES),A              ;in HL register pair
          LD (REM),HL             ;Store answer
          RET
IDEND:    DW £8000
ISOR:     DW £1FFF
RES:      DB 0
REM:      DW 0
```

Firstly, the A register is cleared, it will eventually hold the result of the division. Then the HL register pair are loaded with the divIDEND and the BC with the divISOR. The divisor is then subtracted from the dividend and the result is checked to ensure that it is not negative. Providing it is not negative 1 is added to the A register and a jump is made back to the label SUB and the subtraction is implimented again. When eventually the dividend is smaller than the divisor (ie the division is complete), a jump is made to the label finish where the REMainder is loaded into the HL and then into the data-word with the label REM. The RESult or Quotient (as it's called!) is transfered from the A register into the data-byte pointed to by the label RES.

The dividend should be placed at the label IDEND and the divisor at label ISOR before the routine is started.

This could easily be transported into most programs as a self contained routine. Before entry the two labels would be loaded with the necessary numbers and for safety a check should be made to ensure the dividend is larger than the divisor also the RES and REM labels would be cleared.

*** PHIL EYRES ***

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WHAT IS A UTILITY ?

Since members have been asking for some enlightenment on to what a utility is, and what it does, I'll print this explanation that Dave Thompson sent in with his new MERGE program, ...which is included in the Program Library.

Firstly, MERGE is a utility that is designed to join together two programs written at separate times. This means that programs can be written in sections and joined together later using MERGE. Ideally, standard routines could be written and kept in a library, ready to use whenever required. These routines could be anything, but as an example you could have a sort routine, which would sort an array into order. Then, any time you write a program requiring such a sort you would only have to load it in and not totally re-write it. So, here's Dave's explanation of how MERGE works :-

Although this program was developed to run only on the MTX512, the principle should apply equally to the MTX500. The first part of the program is designed to move the first basic program out of harms way from £4000 to £8000. Then it goes on to write it's own three lines of Basic to print "LOAD PROGRAM TO BE MERGED","COMPUTER IS IN THE LOAD MODE" and the LOAD"" command. Basic TOP variable is adjusted to suit and the program is RUN by the call to £2CAF. This elaborate procedure was found to be necessary due to my failure to emulate the LOAD"" command from m/code or ROM Call.

The second program is now loaded.

The second part of the program then moves any NODDY from the top of the second program and joins it to the top of the first program. (With it so far?)

This first program, now complete with it's own and any added NODDY, is now joined to the top of the second program. System variables for NODDY and BASIC are now adjusted and the whole program may be listed or RUN.(Whew!!)

Ed-> With this sort of program it is necessary to follow a few rules, ie line numbers must not conflict, variables must only be used once, Noddy variables must not be defined twice etc.

We have several programs in the Program Library which operate in a similar way, namely:-
RELOC which relocates assembler code into high memory.
RENUM this renumbers your Basic programs, spacing out line numbers in units of 10. It also renumbers GOTO's & GOSUB's
Hex/Dec/Bin is a utility which will give you the decimal equivelent of Hex numbers and the Binary equivelent of Decimal numbers. This, like Renum, is relocated into high memory and so transparent to the user, only showing itself when prompted by the user command.

It might be a good idea to obtain them from the library and try them out, in order to see how they work.

HARDWARE AND SOFTWARE
PRICE LIST

This month Memotech have supprised us with a new release, the Memotech PC, no it's not a PC compatible. It is an MTX 512 with 80 column board, RS232, 1Meg SDX, Interface and Software. All this will sell for an amazing £499.00. This is truly remarkable, such high quality products at such low prices. (See SDX review elsewhere in magazine). On a not so good note, I have heard one rumour, and I must stress that it is a rumour, that is, that Memotech have drastically run down their Witney site, with speculation that there is less than a dozen people there now. This of course could be because they have made their Christmas quota of computers and are now only having to undertake distribution, ... I surely hope so!!.

MEMORY EXPANSION BOARDS

32K	£40.00
64K	£50.00
128K	£80.00

SPECULATOR	£40.00
NEWWORD ON ROM	£40.00
PASCAL ON ROM	£40.00

DMX80 PRINTER £200.00
(INCL. CONN. CABLE
 AND P & P)

SDX500K +I/F	£250.00
SDX1MB +I/F	£300.00

SDX500K +I/F
+80 COL,+CP/M
NW & SC   £400.00

SDX1MB
(AS ABOVE)   £450.00

FDX 1 * 500K	£600.00
FDX 2 * 500K	£650.00

SILICON DISCS 500k £165.00
SILICON DISCS 1MB £499.00

Software prices for the best and most popular software:-

Zarkos	£6.00
Qogo2	£6.00
Surface Scanner	£6.00
Chamberoids	£6.00
Fathoms Deep	£6.00
Dungeon Adventure	£6.50
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Canvas	£7.95
Chess	£8.75
Ed/Asm	£7.95
Memosketch	£7.95

Dust cover's Only £3.50

!!! Super Cheapies !!!
(Only from stock)

Goldmine	£3.00
Star Command	£3.00
Maxima	£2.50

Interfacing Kits From MOC

We have two kits available at present, with plans for a further kit in the offing, this will be an A to D converter, should it get off the ground. However, at present this is what we have to offer:-

Internal Connecting lead	£4.50	Cheques to MOC please
LED interface kit	£6.50	
Speech Synthesiser Kit	£18.00	

EMULATING   BASIC
BY
Dave Thompson

I have just discovered the ROM call for emulating BASIC commands
entered in direct mode. I have not been able to test it with
every Basic command due to getting this in the post and on it's
way to the mag. (Ed-> In time for the Speculator prize draw!) It
has always been easy to run m/c programs from Basic via the
ASSEMBLER but not so easy to command BASIC from m/c. I hope the
following example solves this problem :-

```
              LD  HL,LIST         ;OR ANY OTHER COMMAND FROM BELOW
CMD:          LD  DE,(£FA83)      ;DE=BUFFER ADDRESS
LOOP:         LD  A,(HL)          ;A=DATA
              LD  (DE),A          ;SEND DATA TO KBD BUFFER
              INC HL              ;UPDATE REGISTERS
              INC DE
              CP  £FF             ;END?
              JR  NZ,LOOP         ;IF NOT, DO AGAIN
              CALL £0287
              RET
LOAD:         DB  £9E,£22,£22,£FF
LIST:         DB  £9B,£FF
GOTO:         DB  £96,£31,£30,£30,£FF
```

As you can see from this example BASIC commands that you want to
use must be defined using DB (DataByte). The first byte in each
case is the TOKEN for the command and following bytes are it's
SYNTAX in ASCII.(i.e. GOTO in the example is GOTO 100, and
LOAD "".)

Obviously, the list of commands can be made as long as required
and the above can be used as a subroutine, by preloading HL with
the command address and then call CMD.I think you will agree that
the programming possibilities seem endless, I hope everyone gets
many inspirations from this.

LIST   OF   TOKENS

REM	£80 - 128	DIM	£91 - 145	NODE	£A2 - 162	ROM	£B3 - 179
CLS	£81 - 129	ADJSPR	£92 - 146	NEW	£A3 - 163	RUN	£B4 - 180
ASSEM	£82 - 130	EDIT	£93 - 147	PAPER	£A4 - 164	SAVE	£B5 - 181
AUTO	£83 - 131	NEXT	£94 - 148	NODDY	£A5 - 165	SOUND	£B6 - 182
BAUD	£84 - 132	FOR	£95 - 149	ON	£A6 - 166	EDITOR	£B7 - 183
VS	£85 - 133	GOTO	£96 - 150	OUT	£A7 - 167	DSI	£B8 - 184
CONT	£86 - 134	GOSUB	£97 - 151	PLOD	£A8 - 168	PLOT	£B9 - 185
USER	£87 - 135	INPUT	£98 - 152	PANEL	£A9 - 169	STOP	£BA - 186
CRVS	£88 - 136	IF	£99 - 153	GENPAT	£AA - 170	ANGLE	£BB - 187
CLEAR	£89 - 137	MVSPR	£9A - 154	PAUSE	£AB - 171	SBUF	£BC - 188
CLOCK	£8A - 138	LIST	£9B - 155	PHI	£AC - 172	VERFIY	£BD - 189
ATTR	£8B - 139	LET	£9C - 156	POKE	£AD - 173	DRAW	£BE - 190
COL	£8C - 140	LLIST	£9D - 157	RAND	£AE - 174	ARC	£BF - 191
INK	£8D - 141	LOAD	£9E - 158	RETURN	£AF - 175	CIRCLE	£C0 - 192
CSR	£8E - 142	LPRINT	£9F - 159	READ	£B0 - 176	LINE	£C1 - 193
DATA	£8F - 143	SPRITE	£A0 - 160	VIEW	£B1 - 177	CODE	£C2 - 194
PRINT	£90 - 144	CTLSPR	£A1 - 161	RESTORE	£B2 - 178		

Firstly, some addresses, which you may find useful:-
LEVEL 9's new customer mail-order/enquiry address
Level 9 Computing
P O Box 39
Weston Super Mare
Avon
BS24 9UR
...and three Memotech dealer addresses.

Thoughts and Crosses	Mighty Micro	TIMATIC SYSTEMS
37 Market Street	268 Wilmslow Rd	Newgate Lane
HECKMONDWIKE	Fallowfield	Fareham
West Yorkshire	MANCHESTER	HANTS
	M14 6WL	PO14 1AN

Questions and Answers
1.Geoff Gardiner of Knutsford Cheshire:-
It's nice to see the silicon discs coming down in price –
that should make it unnecessary to think about changing to
16 bit. I wonder if the new megabyte floppy drive can be
used as a direct replacement for the half meg's?.
->Ed. If you look in your FDX manual under 'CONFIG' you
will see a list of all the types of drive that CP/M will
support, they range from SS SD 40T 5 1/4" floppies,
through to DS DD 80T's, CP/M also supports 8" drives and
silicons. So connect any size drive, change the Config and
Startup procedures and your system will recognise the
drive. So simply, "Yes", you can change to 1 meg drives
with no 'agro' what-so-ever!

2.Kevin Green of Norwich
Perhaps I could suggest a possible article for the
magazine. As a complete beginner to computing I find
utility software very confusing, I have no idea what it is
used for. An article listing software available and it's
uses would be very useful to the beginner and possibly to
the more advanced user as well.
Ed->What a good idea, I've started working on it, If
there's time I'll include a starter page in this mag, just
to get some motivation going, perhaps members would like
to put forward there suggestion on this theme.

Hints & Tips
1.Andrew Capon has sent in this update to the Pascal CSR
procedure printed last month:-
PROCEDURE CSR(X,Y:INTEGER)
BEGIN
  WRITE (CHR(3),CHR(X),CHR(Y));
END;
This will only work with the MTX operating system. i.e.
Hisoft Pascal ROM.

2.A second 'helping' from Andrew Capon:-
Recently I bought 'POT HOLE PETE' and like Tony Street
(Ed-> See a previous Your Letters page) couldn't get it to
work on my MTX 512 with the Pascal ROM fitted, so I hacked

into it and found the problem. It's all to do with the
Sound chip and Memotech never telling anyone everything.

When strobing the Sound chip using IN(3) at least 32 clock
cycles must have elapsed before additional data may be
strobed, in Pot Hole Pete it is done as follows:-
888A IN A(£03)
888C CP £03
888E JR NZ,£888A
8890 RET
This works perfectly on most machines, but what Memotech
did not tell everyone was that input port 3 is also used
to tell if an extra Rom is fitted or not!

The most significant nibble of the result of IN(3) varies
on the extra ROM's fitted, so as a result of £73 is
obtained when the Pascal Rom is fitted the computer goes
into an endless loop.

The routine in Pot Hole Pete should read as follows:-
888A IN A,(£03)
888C AND £0F
888E CP £03
8890 JR NZ,£888A
8892 RET

The AND £0F masks out the high nibble. Actually this code
isn(t really necessary so to get the program working just
put the value 0 in addresses £888E and £888F.

Apologies
1.Last month in the program Library we reviewed a new
program Called "ANOVA", wrongly I said that it was sent in
by Liam Redmond, it was infact sent in by L. Reynolds, so
thanks Mr Reynolds and sorry for the confusion. <-Phil.

Moans and Groans
Paul Schofield - Switzerland. Airing his problems with a
250K disc drive!
...one can tolerate minor faults and in time no doubt one
could learn to live with:-
 - the dreadful keyboard bounce with disc connected
 - frequent reboots
 - and the regular excursions into the Panel.
What is totally unacceptable, however, is:-
 - regular program wipe-outs, when either the disc causes
the system to hang completely or sometimes for no apparent
reason whatsoever
 - less than 50% success rate at saving programs
 - and worst of all, while the disc software seems
incapable of reliably updating it's own directories, it
consistantly changes bytes within the user program area.
Ed-> Has anyone else has servere problems like this with
there disc drives?? ...We'd like to know!!

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AGROVATOR	61828	A.DOBSON		MAXIMA	501250	*R.SIDDALL
ASTROMILON	30830	*T.NEAL		MINER DICK	22520	*R.SIDDALL
ASTROPAC	69390	A.DOBSON		MISS ALPHA	43840	*R.SIDDALL
BLOBBO	71233	T.PICKSTONE		M OMEGA	4400	*T.NEAL
B.BILL	219610	A.DOBSON LEVEL 1		NEMO	11080	P.CRIGHTON
B.BILL	158334	A.DOBSON LEVEL 9		OBLOIDS	60040	M.GELDER
CHAMBERDIDS	19 MINS	P.ERIKSSON		PHAID	1965	A.DOBSON
COBRA	5634	A.DOBSON		P PETE	39630	A.DOBSON
CONT RAID	10810	M.GILL		QOGO 2	255000	*R.SIDDALL
D.DESTROYER	3380	*T.NEAL		SNAPPO	79300	P.ERIKSSON
EMERALD ISLE	725	*R.SIDDALL		SNOWBALL	1000	P.COUGHLAN
E. ZARKOS	90 OBJ	*R.SIDDALL		S OF PETE	10542	P.ERIKSSON
F. DEEP	1420	*A.LYNCH		STAR COMM	90410	P.CRIGHTON
FELIX	20600	P.COUGHLAN		SUPERBIKE	10KM	*T.NEAL
FLUMMOX	5681	*T.NEAL		S M/FIELD	829	M.GELDER
GOLDMINE	6025	P.CRIGHTON		S SCANNER	7340	A.DOBSON
HAWKWARS	15850	P.CRIGHTON		T FIGHTER	2980	*T.NEAL
HUNCHY	5681	*T.NEAL		TAPEWORM	168515	A.DOBSON LEVEL 1
ICEBURG	17431	A.DOBSON		TAPEWORM	150500	A.DOBSON LEVEL 9
KILOPEDE	33440	P.CRIGHTON		T ZONE	7610	P.ERIKSSON
KNUCKLES	488650	P.CRIGHTON		TOADO	107549	N.GOODING
L OF TIME	950	*R.SIDDALL		TURBO	23030	M.GELDER

* Denotes New High Score

RS 232 A STANDARD INTERFACE ?
BY
GEOFF GARDINER

I am in the process of going "on-line" to the databases, but before applying to Prestel there was the necessary preliminaries of interfacing the modem and looking into the programs. The first stage brought to light what looks to me to be a blatant breach of the RS232 protocols by DR (Digital Research), so I have prepared some noted which I hope may be of use.

RS232 and the FDX

FDX owners who have tried to connect a modem or printer to the serial ports will have been mostly greeted with silence. The cause lies with the DART initialisation procedure. The communications board brochure states that when the DART is initialised by a BAUD command (e.g. BAUD B,1200) write register 5 of the DART will be loaded with 68h. The effect of this is to send the RTS and DTR handshaking lines negative, and any connected apparatus that follows the RS232 conventions properly (many don't) will be inactivated. Why this value, 68h, has been used is a mystery, but it may be that DR's programmer was confused, as many have been, by the inverted logic of the old teletype conventions. Logic 0 (i.e. "Low") is positive voltage for communications, and logic 1 ("High") is negative. (See "The RS232 Solution" by Joe Campbell, pages 62 & 63.)

I wrote a little program to put the correct value, EAh, into write register 5 after BAUD.COM had been run, but then found that CONTACT.COM does the same thing, and one cannot correct that program once it is running. It was clear that the programs had to be altered, and after a long search I found the places that have to be patched. The procedure is as follows:-

Insert a system disc (not your origanal!!) which must not be write-protected, amd must contain BAUD.COM, CONTACT.COM and DDT.COM.
Type DDT BAUD.COM <CR> <-Carriage Return
    S01F5 <CR>
    EA <CR>
    . <CR>
    CTRL-C (pause while the computer reacts to this command)
    SAVE 2 BAUD.COM
If you wish to keep the old program a new name will be required for the amended program. So the save instruction might say "SAVE 2 BAUDEA.COM". 'Stat' tells us that BAUD.COM is 2K so you would expect to put 8 after SAVE, but 'Stat' does not seem to have heard of programs (files) under 2k. BAUD appears to be about 190 hex, so 2 blocks should be sufficient.

Changing CONTACT.COM is similar. The full routine is:-Type DDT CONTACT.COM <CR> S0798 <CR> EA <CR> .<CR> CTRL-C (pause!) SAVE 40 CONTACT.COM.

PASCAL MUSIC
By
Paul Schofield

If you only wish to make sound effects for games there is a lazy way out. Just POKE some values into the sound control buffers until you find a note that you like and let the interrupt routines do the work for you. This is most easily done in Basic. The same pokes are then put into Pascal subroutines, one per sound effect. The only other sound routine you need then is SOUNDOFF(chan) to set zero volume for the appropriate channel.

Music of course is a little more difficult. The enclosed program plays the scale of CMAJOR repeatedly until you press a key. Most of the routines overleaf are self explanatory, but there is a small timing problem with PLAY. There must be at least 32 clock cycles between the two INP(3) calls used to strobe data into the SDP. The DIV between the two outputs effectively ensures this.

The note is passed to play in the format OCTAVE number, NOTE number in octave. I have found this generally the most convenient method of handling notes in programs. If you are playing a tune as a background to a game, however, it is best to set up a table containing the actual values to be output so as to avoid the decoding in the PLAY routine.

NOTE
Pascal provides what is potentially a very easy method of handling musical notation. I have not tried this with the MTX as any unnoticed input error can have serious consequences in HISOFT Pascal. It is in VAX Pascal as well, but at least you have the option of writing an exception handler as a safety net. You define a user type NOTE as follows:-
TYPE

NOTE = (CN1,CH1,DN1,....CN5);

This definition means a variable can assume one of the 49 values corresponding to 4 octaves + C in the fifth octave. There are two problems with this:-
(i) Each element must be a valid identifier. This means we must use N=natural H=sharp L=flat in the second character.
(ii) We have to define the semitone between G and A to be either GHx or ALx. If we use the latter format the input GH2 will cause a program crash.

The advantage is that an array of note outputs can be set up and referenced by:-

    REG := TAB1[1,ORD(NVAR)];
and
    REG := TAB1[2,ORD(NVAR)];

Where TAB1 holds the appropriate output values for channel and NVAR is a variable of type NOTE.
                    PROGRAM OVERLEAF

10

```
PROGRAM CMAJOR;

TYPE

OCTAVE=SET OF 1..12;

VAR

FRTAB   : ARRAY [1..12] OF REAL;
CHTAB   : ARRAY [0..2] OF INTEGER;
NOTE    : 1..12;
INSCALE : OCTAVE;

PROCEDURE INITCH;
VAR CH : ONTEGER;
BEGIN
   FOR CH:=0 TO 2 DO CHTAB[CH]:=2*CH;
END;

PROCEDURE INITFREQ;
BEGIN
   FRTAB[1]:=130.8;
   FRTAB[2]:=138.6;
   FRTAB[3]:=146.8;
   FRTAB[4]:=155.6;
   FRTAB[5]:=164.8;
   FRTAB[6]:=174.6;
   FRTAB[7]:=185;
   FRTAB[8]:=196;
   FRTAB[9]:=207.7;
   FRTAB[10]:=220;
   FRTAB[11]:=233.1;
   FRTAB[12]:=246.9;
END;

PROCEDURE VOLUME(CHAN:0..2;ATT:0..15);
VAR
REG : 0..255;
DUM : CHAR;
BEGIN
   REG:=(CHTAB[CHAN]+1)*16+128+ATT;
   OUT(6,CHR(REG));
   DUM:=INP(3)
END;

PROCEDURE PLAY(CHAN:0..2;NOTENO:1..12;OCTAVE:1..4);
VAR
FREQ    : REAL;
REG     : 0..255;
DUM     : CHAR;
FREQ1,I : INTEGER;

BEGIN
  FREQ:=FRTAB[NOTENO];
  I:=1;
  WHILE I<OCTAVE DO
    BEGIN
     FREQ:=FREQ*2;
     I:=I+1
    END;
  FREQ:=125000/FREQ;
  FREQ1:=ROUND(FREQ) MOD 16;
  REG:=CHTAB[CHAN]*16+128+FREQ1;
  OUT(6,CHR(REG));
  DUM:=INP(3);
  REG:=ROUND(FREQ) DIV 16;
  OUT(6,CHR(REG));
  DUM:=INP(3)
END;

PROCEDURE DRAW;
VAR
X : INTEGER;
Y : REAL;
BEGIN
  FOR X:=0 TO 180 DO
  BEGIN
     Y:=SIN(X*3.142/90);
     PLOT(X+10,96+ROUND(50*Y));
    END;
END;

BEGIN
INITCH;
INITFREQ;
INSCALE:=[1,3,5,6,8,10,12];
VS(4);PAPER(1);
PAGE;
VOLUME(0,2);
REPEAT
  FOR NOTE:=1 TO 12 DO
    BEGIN
     IF NOTE IN INSCALE
       THEN BEGIN
       PAGE;
       PLAY(0,NOTE,1);
       INK(NOTE+1);
       DRAW;
       END;
    END;
  PAGE;PLAY(0,1,2);INK(14);DRAW;
UNTIL INCH<>CHR(0);
VOLUME(0,15)
END.
```

500K SDX & CP/M REVIEW

By

Rob Eyres

The SDX system presents itself as a neat, well thoughtout design. It comes in three parts, the disc drive unit, the disc controller and an 80 column card 'cum' RS232 interface.

The half height disc drive is connected to the disc controller via a long ribbon cable which has a termination along it's length to allow connection of a second 'dummy' disc drive. The drive has it's own power supply (so it needs another wall socket!) and also powers the disc controller board via a cable supplied. This board is housed in a smart black aluminium case which matches the style of the keyboard case, connection is by the expansion port on the left hand side of the machine.

Provided that you have nothing else fitted inside your machine such as memory expansion, RS232, Pascal Rom or Neword Rom, then the 80 column board will fit inside. This is because the 80 column board is a double width board and thus takes up both slots!. This means that your machine must be a standard 512 (because CP/M requires 64K of memory). However do not despair, all you 500 and RS128 people, MOC always has the answer (Ed—> Well, nearly!). Memory expansion cards will fit inside the disc controller case with only a small amount of modification required, although some use of a soldering iron is necessary. Drop MOC a line if you would like to know more about this.

The main advantage of the SDX system is being able to run CP/M. The system comes complete with three discs, the CP/M system disc, Neword and Supercalc. As CP/M has been around for years, there are literally thousands of programs available, thus breaking you free from Memotech reins. A very good source of CP/M software is the CP/M User Group, who have 100's of disc full of Programs/ Utilities/ Games, etc.

The system has been well documented, in a large A4 manual, which is more reminiscent of business machine packaging. This manual includes setting up procedures, operating system description and extensive notes on Neword and Supercalc. I think it a good point to note that reading the manual is really obligitory for anyone new to disc's, and that this reading could well take a couple of evenings, so don't expect your new SDX to perform miracles as soon as you switch on.

The main disadvantage of upgrading to an SDX is losing the use of the expansion bus, because it is used by the controller, but this problem is not insurmountable.

The only fault found so far is the 80 column board getting a bit warm during extended use, this results in flickering characters on the screen which is very irritating. As yet we've not solved this one.

One last important point, you will need a monitor and a T.V., so be warned!!.

P R O G R A M   L I B R A R Y
£1 Per Cassette, 2 Programs per Cassette

As you can see, we are quickly outgrowing one page, this creates problems in an already cramped magazine, I'll have to give that one some thought for next month. Also due to the support for the library, I've decided to make up an information sheet, which will contain past reviews of all the prorams available, this should make software selection easier, especially for new members. Anyone wanting a copy, just send in a S.A.E.(All extra donations put towards enhancing the club). One last point of interest, I have decided to make available our library to a newly formed Swiss user group 'Memomucs', in return they will start up a swiss program library, providing us with their software releases as they become available. This is an interesting development, and really we can only play it by 'ear' to see how it goes.   Phil

1.Basic & Assembler Programs

All programs available on cassette, 2 programs per cassette, £1 per cassette. Or on disc, £2.50 per disc, please enclose a disc, stating capacity.(Some programs are only available on cassette!!).

1.Hex-Dec-Bin Convertions. (Binary Bit In Assembler)
2.CGEN   Sprite Generator.
3.3D Drawing Board. Rotate a skeleton of a cup & saucer in 3D.
4.Whist.   The Card Game
5.Memory Save.   This Utility will Save a block of memory to tape and retrieve it.
6.MTX Drawing B'rd. ;Two basic drawing boards, MTX DB has
7.LOGO Drawing B'rd.;more extensive commands
8.Simplex Tablaeux. Applications Program
9.Breakeven.   Applications Program
10.Statistics   Applications Program
11.An Unsolved Prbm Applications Program
12.Radio Routines Applications Program
13.Light Cycles.   Arcade Game
14.Hex/Dec/Bin   Conversions using USER commands!
15.Renumber II   Renumbers Including GOTO's etc
                  (14 & 15) are Utilities and as such reside high in memory transparent to the user.
16.RELOC   ; Relocs Assembler Properly!!
17.Character; Editor Yepp!! Another Sprite Gen!!
18.Quasimodo; Excellent Arcade Game
19.Planner ; YASG (Yet Another Sprite Generator)
20.Hanoi   ; Classic Puzzle (Brilliant simple use of
21.Nobie   ; Simple Text Game   Graphics)
22.Hi-Lo   ; Just like Bruce's Play Your Cards Right
23.Composer ; Our First Sound Generator!!
24.Anova   ; Applications Program
25.CASHFLOW ; Applications Program
26.RenumIII ; Utility   !!!26,27 & 28 cassette only!!!
27.Merge   ; ¤¤¤ New ¤¤¤ Utility
28.Money Manager ;¤¤¤ New ¤¤¤ Applications program
29.Word   ; ¤¤¤ New ¤¤¤ Word Processor
30.Reversi ; ¤¤¤ New ¤¤¤ Strategy Board Game
31.Full Time; ¤¤¤ New ¤¤¤ Football Manager Game
32.PANEL3 ; ¤¤¤ New ¤¤¤ Panel extensions

Please send in any programs that you have for inclusion in the library, where-ever documentation is necessary try to include it in the program. Ta!

2.Programs/Procedures in Pascal
(Available as listings or on disc. Please provide sufficient postage to cover club costs!!)
1. DBASE for Disc Turbo Pascal
1(a). Comprehensive Create File Procedure
1(b). Simple Display File Procedure

3.Articles From Previous Magazines
(Available as listings, please provide sufficient postage to cover club costs. TA!)
1.PANEL2 Utility. An updated version of PANEL1, which includes a second feature.
2.Undocumented Neword dot commands.(Vol1 Iss.7)
3.Hisoft Pascal Review (vol1 Iss.8)
4.Neword Rom Review (Vol1 Iss.5)
5.RST10 Codes Explained (Vol1 Iss.3)
6.VDP Explained Using assembler (vol1 Iss4,5,6)
7.System Variables (Not Previously Published!!)

4.CP/M Progams/Utilities
(!!! Available only on disc !!!, please send in a formatted disc stating capacity and enough postage to cover).
1.A simple mail label system for up to 3 across labels, written in EBasic. Disc includes Ebasic compiler and run-time program. Consists of a suite of half a dozen programs. (Ensure that you send in at least 250K of blank disc!!)
2.PLOT33 A new graphics plotting package. Create and print your own graphics. Set up for DMX type printers but will support most others. Must be seen to be believed. Please ensure you have at least two weeks free when ordering this one, you'll need it!!. (Ensure that you send in at least 300K of blank disc for this one).
3.SEDIT A program written in FDXB basic. Not fully working but comes with 3 very impressive 'piccies' ready to display.

5.Program Reviews
Merge:- Another brilliant utility from Dave Thompson, I really don't know how he manages it. This one's a bit of a gem and is explained fully on page 5.

More Reviews Overleaf

Reversi:- Written in Basic by 'yours truly', it seems to play a good game, at least for my level, being Basic it takes a couple of mins to make a move. It should be possible to speed this up a bit, I'll have a go as soon as I get time. Worth playing with!!!

Money Manager:- This offering from Mike Pike is a very well written cashflow program, the menu alone has 20 options, covering everything from setting up data, saving/loading data, forcasting cash flow and making a hard copy. This one is for those of us who have two or three credit cards, several bank accounts and a mortgage that appears to be supporting Maggies latest brain-wave. Along with Cashflow, the club now has two really usable money management programs.

Word:-By Brian Clarke. This is only for a MTX 512 due to the memory 'gobbling' of word processing. A first for the club, this word processor, although obviously only simple proved very easy to use, it would appear ideal for making that odd letter. Print-out at the moment is only 40 column

but that's not too much of a draw-back. There's room for up to 10 pages of text (quite sufficient for the average quicky letter!). I liked the use of Paper and Ink colours, it made it's use very easy on the eye's. Oh!, one final thing, data can be saved separately.

PANEL3:- This utility has come into being due to the effort of several club members. It now contains all three previously published PANEL articles in one program, which is now fully relocatable as it utilises the RELOC utility found elsewhere in the library. An excellent example achieving exactly what we set out to do when we first started.

Full Time:- This is an interesting interactive program sent in by Stephen Pond. You are the manager of a football team, where you choose the team for each match, you are kept well informed of your players performances to enable you to change the team, league tables are made up and it is your objective to keep a successful team. All in all, a good, interesting program, well worth a look at if you like this sort of game.

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CHRISTMAS SALE - AT LOWEST PRICES!

* Any one of the following titles @ £2.75
* Buy three and get one free!
* Buy all 12 titles for just £22-00 incl. p&p.

1.Reversi	2.Toado	3.draughts
4.Backgammon	5.Music Pad	6.Spellicopter
7.Helimaths	8.Man From Granny	9.Graphics
10.Little Devils	11.Qogo	12.Mission Alphatron

Contact and cheque to Mr David Lam of 105 Geary Road, Dollis Hill, London. NW10 1HS.

Ed-> Please note, correspond only to David about this advert, the club can pass on no information.

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MTX500 For Sale

Mr G.V.Landon has his MTX for sale at £90, this price includes a selection of software and a Ferguson cassette recorder.
Contact him at :- 26 Ivory Close, Holbury, Soton, SO4 1AH.

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COMMUNICATIONS

Increasingly, even to the home computer user, communications is becoming a topic of interest, the good old modem has never sold so well. But personally, I have never had the need, nor the money for such an item. For me, something more home made, cheaper (or free to use!) would be much more applicable. For instance I have considered the use of a CB unit and a D to A convertor to send data, this would be a great little project for communicating over short distances, and would comparatively cost little if you picked up second hand components.

One other form of data receiving that I had not given much thought to, came from a member (sorry, I mislaid your name!) in the form of a cutting from the Guardian (29/8/85). It's topic was satellite reception and it went something like this:-

Apparently, the latest craze in America is to 'hack' into satellite transmissions using home made antenna dishes and a receiver. This is especially fruitful because of the private T.V. networks that are only usually available to fee paying customers. Everything is 'hacked from feature films to 'raw' bulletins.

Of course, in this country the pickings are much leaner, however, there are satellites up there 'beaming away' at us all the time and what makes it all the better, most of them you can 'hack' legally. All you need, apart from the knowledge, is a few add-ons which are readily available. Weather satellites are a good example, these can be picked up with a receiver and dipole aerial, once-tracked, the incoming signal can be recorded to tape and played back through an A to D to convert the signal into the digital paulses the computer needs. To do this all yourself would be a little ambitious, so Clifton College Bristol run a satellite project and for the price of a disc and p&p they will send enough info to get you started.

Another interesting satellite project that the French are undertaking is to send up a satellite which will sell on a no-questions-asked basis, detailed pictures of any part of the earths surface. The implications of such happenings are self evident, satellite enthusiasts with home built decoders could watch close-up pictures of Earth from their living room. They could for instance receive pictures of NATO manoeuvres or shots of Greenham or Molesworth.

This seems to bring to mind the saying that science has no masters, the same technology which creates surveillance makes it almost impossible to keep secrets.

To receive weather satellite pictures you should obtain a letter of permission from the Radio Regulatory Department of the Home office.
Further information:- Clifton College Satellite Project, Clifton College, Bristol. BS8 3JH.