


**SHARP USERS
CLUB**



M280K



M280B



M2800



M280R



M2700

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Number 1

S T O P P R E S S

Reference - Personal Computer Services Ltd
(page 5.) The name has changed to "Direct
Business Equipment Ltd". Telephone number
until April 30th - 061 320 4857.

After April 30th Telephone number - 061
367 8234. Ask for Ian Burke or John Burke.
In case of problems ring John Ibberson
(MZ80B sub editor.)

CONTENTS

GENERAL SECTION (See also ***)

Editorial	2
Club News	3
Sharp Computer Book Bargains	4
Items for Sale	5
Letters: "Press any Key"; Racehorse rating	6
: "ASTROCALC"; Gateway Computer Club	7
RAM Checker Program - (C.Hearn)	8
"DISKETTE COPY" now copies anything (M.H/J.E)	12
"BOX" command for SA-5510/S-BASIC (E. Stanley)	13
"DISKEDIT" for the K/A/700 (J.E/M.H)	14
Macro-Assembler for Sharp Computers (P.Tuffs)	16
Notes for Newcomers (A.Ferguson)	17
Choice of Interpreter; Keyboard Modes	17
Formatting numbers	18
MZ-700 "PRINT USING" (G. Childs)	20

MZ-80K SECTION

Editorial (M.Hawes)	21
Bits and Bits and pieces (J.Edwards)	22
: Tape keys tip; "SUPERDISK" (1D & 2D)	22
: SP-7011 bugs; "ZEN.DOS" (DIR/"SQUEEZE")	22
: "ZEN" form feed mods	23
"S-DOM" Documentation (P.Tuffs)	24
MZ-80K Library News (A.Ferguson)	30
MZ-80K Disk Library News (A.Bunting)	32

CP/M SECTION

*** Porting problems with different CP/M's (M.H)	33	***
--	----	-----

MZ-80A SECTION

SP-5060.A1 Execution halt (M.Hawes)	34
SA-1510 bug; Problems and printers (G.Chapman)	34
New typewriter mode INPUT routine (G.Chapman)	35
*** SA-5510 "/TO" bug (C.Hearn)	37 ***
MZ-80A LIBRARY (I.Baldwin)	37

MZ-80B SECTION

Editorial/Library (J.Ibberson)	38
Interfaces and daisywheel printers (J.I)	39
"SCRNS(X)" in MZ-80B Basics (J.E and J.I)	40
Commercial CP/M Software for the "B" (J.I)	42
More on extra I/O commands in SB-6511 (J.I)	43
SB-5520/HUCAL 80B (M.Hawes)	44

MZ-700 SECTION

Modems; RS-232 Interface (T. Cowell)	45
MZ-700 LIBRARY (R.Houghton)	50
Letter - Graphics plotting help wanted	50
MZ-700 Disks/80 Columns (P.T/M.H/J.E)	51

HARDWARE SECTION

*** Successes and Failures (J.Edwards/M.Hawes)	52	***
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Maurice Hawes
64A St. Mary's Street
Bridgnorth
Shropshire WV16 4DR

1st March 1988

Please note my new address, AS ABOVE. As I write, there is no telephone installed, but one should be fitted at about the time this Magazine is published. I am hoping to transfer my previous number (07462 3254), but if you have problems I suggest you ring directory enquiries, or leave a message on one of the following:-

0746 761896 (Acorn Natural Foods, 9.00-5.00; E.C.D. Thurs)
07462 3783 (Mother-in-law, Mrs. Fry, any reasonable time!).

These codes ARE correct; half of Bridgnorth is now on SYSTEM X; 0746 applies to 6-figure numbers, whereas code 07462 applies to 4-figure numbers. There should be no problems with mail, as the move is only a few hundred yards, and Bridgnorth is a small town where everybody knows everybody else; but if you chance to speak to any former Club members, please tell them my new address.

Your Committee has been slightly disappointed by the fact that around 90 of the 1987 members have not re-enrolled for 1988. Having said that, we are pleased to confirm that we have enough members for 1988 to keep the Club running along its previous lines. So there will be two more Magazines this year, in July and November as planned, and other activities will continue as usual.

The current strategy of Sharp Electronics (U.K) Ltd, evident at the "Which Computer" show at the N.E.C. in January 1988, seems to ignore home computers altogether, and concentrates on lap-held PC compatibles with LCD screens and built-in hard/soft disk drives, retailing at around £1000-2000. Given this strategy, and the resulting lack of recently-designed Sharp home computers in the U.K., our decline in membership is not surprising; indeed, what is surprising is that we survive at all, given that we are a one-make Club based on 280 machines designed in 1978-82!

Fortunately, we do have a strong nucleus of enthusiastic and knowledgeable members who regard their Sharp MZ-80K/A/B and MZ-700 machines as trustworthy computers which can still perform many useful tasks, and at the same time may be used to develop hardware and software skills in a reliable and friendly environment. There is a lot of new and very useful software in this issue (Chris Hearn's RAM-checking programme has been put in because a member recently found that the official Sharp RAM-checking chip is not 100% effective). Also, in the very near future, we hope to have 80-column conversion kits available for the MZ-80K and the MZ-700, to complement the one already available for the MZ-80A; and we have developed viable disk systems for the MZ-700 (based on parts from earlier machines). Finally, we have not lost sight of our "holy grail" of a universal Club I/O box.

The Club is fast becoming the major source of support in the U.K., for all existing Sharp home computers. Help to keep it that way by contributing to the Magazine and the Library in 1988!

* Vol.8 No.2 will appear in July 1988, deadline 20/6/88 *

For the benefit of new members, a complete list of up-to-date addresses for all Club officials is reprinted below. The only changes from the list in the last issue concern the address and telephone number(s) of the Chief Editor, Maurice Hawes, explained more fully in the editorial on the opposite page:-

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Telephone 0246 472894

MZ-700 Section

Tim Cowell, 17 Victoria Drive, Houghton Conquest, Beds MK45 3LZ
Telephone 0234 742273 (after 6.00 p.m.)

SOFTWARE MANUALS AND BACK ISSUES

A brief reminder that Software Manuals I and II, and most back issues of the Club Magazine are all available from Maurice Hawes.

S.M.I-II, £1-50 each/£2-00 for both (U.K. post free)
Vols. 2-5, 60p each/£2-00 for 4 (U.K. post free)
Vols. 6-7, £1-00 each/£4-00 for 5 (U.K. post free)

Overseas members please add 25p per issue. Maurice also has some spare copies of SHARPSOFT USER NOTES 3,5,6,7,9-18; and SHARPSOFT MZ-700 USER NOTES 1-7,9. Write or ring him if interested.

BARGAIN SALE OF SHARP COMPUTER BOOKS



In January 1988 the Club acquired the complete Sharp book stock of a former Sharp dealer at very reduced prices. We are thus able to offer the following books at £1-00 each including postage or, as a very special offer, any 3 for £2-50:-

- PEEKING and POKING THE SHARP MZ-80K (G.P.Ridley, 62pp)
- PEEKING and POKING THE SHARP MZ-80A (G.P.Ridley, 66pp)
- PEEKING and POKING THE SHARP MZ-700 (G.P.Ridley, 96pp)
- STARTING MACHINE CODE ON THE SHARP K/A/700 (G.P.Ridley, 152pp)
- THE MZ-80A AND MZ-80K EXPLAINED (T.Marriott, 113pp)
- THE MZ-700 EXPLAINED (T.Marriott, 105pp)
- STARTING WITH THE MZ-700 (T.Marriott, 68pp)
- PRACTICAL GUIDE TO MZ-800 COMPUTER GRAPHICS (M.Brinson, 123pp)

The "PEEKING and POKING" books by G.P.Ridley contain much more than implied by their titles; there are sections on memory layout, Basic interpreter layout, personalising your Basic, peeks and pokes, programme tips, data handling, converting programmes, and useful appendices and diagrams.

The "STARTING MACHINE CODE" book by G.P. Ridley does contain a number of specific references to Sharp computers, but much of the book covers Z80 machine code in general terms. The Appendix contains a very useful table for converting Hex codes to Z80 mnemonics, and also shows, very clearly, the differences between MZ-80K/A/700 ASCII and Display code tables; in fact, the book is probably worth £1-00 for the Appendix alone.

The "MZ-... EXPLAINED" books by Tony Marriott contain masses of useful information. The emphasis is on hardware, with very clear diagrams; but software is not neglected. If you are at all interested in how your computer works, these books are well worth their r.r.p. of £5-95, and are fantastic value at £1-00.

"STARTING WITH THE MZ-700" is, as its name implies, a book for beginners. Nevertheless, it does contain some useful tips, including a novel way of jumping safely out of for/next loops! So even if you consider yourself expert you may find something new, and at £1-00 including postage it will hardly break the bank!

The "MZ-800 GRAPHICS" book is a very detailed and comprehensive text. At our offer price it is a real bargain.

We have fairly large stocks of all the books by Tony Marriott, and of "P/P THE MZ-700". But there are only 3 "MZ-800 GRAPHICS", 11 "P/P THE MZ-80K", and 27 "P/P THE MZ-80A". Orders will therefore be dealt with in strict rotation. Send your cheques, payable to the "SHARP USERS CLUB", to Maurice Hawes AT HIS NEW ADDRESS AS GIVEN IN THE CLUB NEWS PAGES OF THIS ISSUE.



There are quite a lot of interesting bits and pieces for sale this time, mainly due to the good offices of John Ibberson, who keeps in regular contact with Personal Computer Services in Denton. The sad thing is that most of the items are available because P.C.S., like Kuma Computers Ltd, have decided that they can no longer afford to handle Sharp computers on a commercial basis (though they have indicated that they would still be willing to do their best to help members of the S.U.C. in trouble).

P.C.S. have a large number of spare parts for the MZ range of Sharp Computers, including key switches. They also have one or two complete specific items, including 2 x MZ-80A's complete (£100 each), 2 x PC5000's complete (the one with the bubble memory and LCD screen) (£250 each); and a CE510P printer for the PC5000 (£80).

P.C.S. suggest that any member requiring any of the above, or other spare parts, should ring 061 320 5011 and ask for Ian Burke. (The full address appears in Vol.6 No.1 p.8)

John Ibberson has already purchased a collection of Sharp computer Manuals from P.C.S., on behalf of the Club, and we are able to offer them at £2-00 each, including postage. Send your cheque to John (address at head of MZ-80B Section), payable to the Sharp Users Club. The Manuals available are as follows:-

MZ-3500 OWNERS MANUAL (9 COPIES)
 MZ-3500 BASIC LANGUAGE MANUAL (12 COPIES)
 MZ-3500 BASIC LANGUAGE APPENDIX (20 COPIES)
 MZ-80B GPIB (UNIVERSAL I/O) MANUAL (9 COPIES)
 MZ-80B RS232 MANUAL (5 COPIES)
 MZ-80B MONITOR MANUAL (2 COPIES)
 MZ-80B OWNERS MANUAL (3 COPIES)
 P4 PRINTER MANUAL (1 COPY)

John also has an item of his own - a P3 printer with MZ-80K interface card, for which he will accept £40-00 (buyer collects).

J.A. Hatcliffe, 94 Peartree Road, Herne Bay, Kent, CT6 7XN (Tel. 0227 365930) has a standard MZ-80K for sale, in very good condition, with Sharp Basic, Sharp Applications, Sharp Systems Programme (Editor, Debugger and Loader), Sharp Machine Language, Lunar Lander, and Astroshoot software, together with all the relevant Sharp Manuals. He will accept £50-00, and delivery might be possible within the London/Home Counties/South East area.

G.R. Smith, 7A Larch Close, Seaton, Devon EX12 2TS (0297 23020 evenings) has an MZ-80K with I/O Box, P3 printer interface and printer, and some unspecified software. He is looking for around £130-00 for the lot, or might split, but must sell in any case.



From Eric Stanley:-

The following routine, if called by USR(\$AAAA), will print the message "Press a key to continue" on line 23 of the screen, and wait for a keypress. It may be placed anywhere in memory (52 bytes) as long as the address \$XXXX is adjusted to suit:-

```

$AAAA  F5          PUSH AF
        D5          PUSH DE
        E5          PUSH HL
        21 54 00    LD HL,0054H      ;X-Y buffer
        26 01      LD (HL),01H
        23          INC HL
        36 17      LD(HL),17H
        11 XX XX    LD DE, XXXXH
        CD 15 00    CALL 0015H
        CD 5B 02    CALL 025BH      ;wait for key
        CD 1E 07    CALL 071EH      ;clear screen
        AF          XOR A
        E1          POP HL
        D1          POP DE
        F1          POP AF
        C9          RETURN

$XXXX  50 9D 92 A4 A4 20 A1 20    Press a
        A9 92 BD 20 96 B7 20 9F    key to c
        B7 B0 96 A6 B0 A5 92 0D    ontinue, 0DH

```

The above version (taken from SOLO BASIC) is for the S-Basic RAM Monitor on the MZ-700, which has its screen co-ordinates buffer at 0054H. The routine may be adapted to the MZ-700 ROM Monitor, or any other Sharp computer, by changing 0054H, 025BH, and 071EH, to suit the Monitor in question.

From Alan J. Burton:-

I have a full set of programmes for rating racehorses, which I am willing to offer to anybody interested. It needs an MZ-80K with double disk drives. The programme and data disks allow the user to type in the meeting, going, time, distance and runners for all 'chases from 16f-40f, or flat races 5f-7f. The horses are then sorted out from the data bank, and the user then enters weights. After the race, a results programme allows the user to enter the revised ratings for placed horses and then adjusts the data file.

Although the programmes are for for "chasers" and "sprinters", slight amendments would allow them to be used for any horses. I have developed the programmes over seven years and can now match any professional rating system. The programmes were written under SP-6015, but do work under SP-7011; if you would like to try them, send two blank formatted MZ-80K disks and return postage to:-

Alan J. Burton,
3 Orwell View Road, Shotley, Nr Ipswich, Suffolk IP9 1NW.

From Paul Trainer:-

Enclosed a pack I have received from ASTROCALC. You might like to mention it in the user notes as it not only caters for the 700 which I have, but also for the A and K models.

Editor's Note:-

To quote from their blurb, "Astrocalc programs are designed to provide the astrologer with reliable, accurate, easy-to-use programs and are available for most home micros."

Astrology is not one of my interests, but the information pack looks most impressive and includes explanatory leaflets and a well-produced 24-page catalogue, which lists a very large number of programmes. The significance of some of the programmes is beyond my ken, and not all of them are available for Sharp computers, but for anyone interested, the address is:-

Astrocalc
67 Peascroft Road
Hemel Hempstead
Herts HP3 8ER
Tel. 0442 51009

From Martin Randall, Publicity Officer, Gateway Computer Club
10 Gedge Close, Bury St. Edmunds, Suffolk IP33 2HD
Tel. 0284 704923

We are a multi-user Club and have 150+ members. We have been active for almost 5 years, and meet on the 3rd Sunday of each month at the "Bob Hope Recreation Centre", R.A.F. Mildenhall, between 14-00 and 16-00 Hrs. Some of our larger individual groups have separate extra meetings at different times of the month. On Sunday 17th January, Acorn UK will be coming to demonstrate the "Domesday Machine" and the "Archimedes".

There is a possibility that in the near future we may start a Club library. In view of this, we may join/affiliate to a number of national groups. This would give our Club access to the magazines of the national groups, so that our members could read them prior to considering whether to join as individuals. Could I therefore have details of your organisation.

(signed) Martin Randall

Editor's note: Martin also gives the name and address of the Gateway Computer Club Secretary, which is:-

Phil Herberer
164d Radcliffe Road
Lakenheath
Suffolk
Tel. (Eriswell) 2363

"WHEN YOUR BITS DON'T BYTE!" or "IF YOUR RAM is WAM"

By Chris Hearn

RAM PROBLEMS?... has your Random Access Memory become Won't Access Memory? ...

The assembler program below allows you to check your RAM in complete safety, and to identify which particluar chip is faulty. If all chips are OK it will tell you too!
M280K/A owners, this is for you, but if you've got an M280B or M2700 then perhaps this article will start you on the road.

SAFETY FIRST - Please note that you should only attempt RAM chip replacement if you feel confident about doing it, and you should ALWAYS observe safety precautions. Particularly always make sure that the mains lead is removed from the computer before you poke about inside. And especially on the M280A keep WELL clear of the screen. Dangerous voltages still exist on the screen even when the power is removed!

First a bit of revision: (experts please yawn and skip this bit!) The M280K/A both have three 16Kbyte banks of RAM called RAM(I), RAM(II) and RAM(III). The monitor is in ROM, from 0000hex to 0FFFhex. (all addresses from now on assume Hex notation). RAM(I) runs from 1000 to 4FFF, RAM(II) (you guessed it!) from 5000 to BFFF and RAM(III) from 9000 to CFFF. Above this is the screen, which uses a different type of memory chip (2114 static RAMs).

So back to the Ram Banks. If you remove the power and lift the lid you will see them in three neat rows. The board is labelled RAM(I), RAM(II) and RAM(III) for the three banks, and the columns are labelled with (bits) D0 to D7. (On the 80A they are on the left side, partially under the keyboard. You'll have to remove two screws and lift the keyboard if you actually have to change some).

When you first switch on, the Monitor ROM should give you the normal message and a flashing cursor. All of you who have "POKED" about in the area of 10F0 to 1108 etc will know that the Monitor ROM needs RAM workspace, which is most of the Area from 1000 to 11FF hex. This is part of RAM(I), which is why you will probably get an abnormal display when you switch on if RAM(I) is faulty!. If this is the case you can swap all the chips in RAM(I) with those in RAM(II) or RAM(III). Proceed with care (details below),and observe the safety precautions mentioned above.

With a bit of luck you should now have a good RAM(I)! If you still have problems then you will either have to invest in set of eight chips, or seek a friendly service department (not too many of those about!). Of course the fault might not be in the RAM...? The next task is to locate 'lazy' chips, or the totally duff chip lurking somewhere in RAM(II) or RAM(III).

This assembler program will check most of the memory for you, from 12B8 to CFFF to be exact. If you have a 'lazy' chip, this program exercises it a bit more than most, so may show it up - a 'lazy' chip is one that is a bit reluctant to change state, either high to low or visa-versa, and can cause an intermittent fault).

For those who would like to try the routine, or have a friend with a working machine, here is the routine. It's in assembler, because it sits at 1200 Hex (ie in RAM RAM(I)). You can't really use Basic, because the Basic "stack" uses RAM(III), and Basic itself sits in RAM(I), so unless your fault is only in RAM(II) you won't have a usable system to do it with (as I'm sure you know if you have this problem!).

The program tests each byte by reading the contents, "flipping" all the bits (i.e ones become zeroes and visa-versa), then writing it back. Then read the byte again and see if it's OK. If it is OK then "flip" the bits again (back to original contents), write it and check if it's OK!. Why do it twice? well when a bit fails it can look like a one or a zero. Also this method flips each bit twice in a short space of time, so should pick up 'lazy' bits which are slow to change one way or the other.

If this first part of the program finds a problem at a particluar address, then the remainder prints the address, the result of writing 00, FF, and 00,01,02,04,08,10,20,40,80 to this address, and finally identifies which chip is faulty by displaying the "bit" and the "Bank" where the fault occurs. It will show faults on all chips in the bank, but stops once a fault is found. You should replace the faulty chip and try the program again untilyou get the message "O.K".

Now that you've found the faulty chip, it must be replaced. The chips are "4116 dynamic RAM chips". They come in two types, those that need only "single-rail" +5 Volt supply and those that need "three-rail" supplies. You need the three-rail version. These days most chips are 250nsec or faster, so speed is not a problem. The safest course is to take the faulty chip with you to the shop!

To change it you need a small flat-blade screwdriver. SWITCH OFF and remove the power lead, then locate the faulty chip, then remove it by placing the screwdriver under each end in turn and carefully levering upwards a little. Repeat until it comes free. Then simply bend the legs of the new chip inwards slightly until they match the holder, check that the little "cut-out" is at the same end as all the others and plug it in. If you get it the wrong way round you will certainly kill it, plus maybe some other stuff too, so double check it!

Now switch on and run the RAM checker program again. If it displays "OK" then congratulate yourself and get back to your favourite program!

RAM CHECKER PROGRAM

```

1200      LD HL,12B7H      21B712 ;START - 1
1203      LD D,D0H        16D0   ;RAM TOP
1205 LOOP: INC HL         23      ;NEXT LOCATION
1206      LD A,H          7C
1207      CP D            BA      ;TOP YET?
1208      JR Z,DONE        282A    ;YES!
120A      LD A,(HL)       7E      ;PICK UP THE BYTE
120B      CPL            2F      ;FLIP THE BITS
120C      LD (HL),A       77      ;WRITE IT
120D      SUB (HL)        96      ;SHOULD GIVE ZERO
120E      JR NZ,DUFF      2006    ;THERE'S A PROBLEM
1210      LD A,(HL)       7E      ;PICK IT UP
1211      CPL            2F      ;as before
1212      LD (HL),A       77
1213      SUB (HL)        96
1214      JR Z,LOOP       28EF    ;CARRY ON IF OK
1216 DUFF: LD A,16H       3E16    ;CLEAR SCREEN
1218      CALL 0012H      CD1200 ;DO IT!
121B      CALL 03BAH     CDBA03 ;SHOW BYTE ON SCREEN
121E      CALL 000CH     CD0C00 ;SPACE
1221      XOR A          AF      ;SET ALL ZEROES
1222      LD (HL),A       77      ;WRITE ALL ZEROES
1223      LD A,(HL)       7E      ;AND READ IT BACK
1224      CALL 03C3H     CDC303 ;DISPLAY RESULT
1227      CALL 000CH     CD0C00 ;AND A SPACE
122A      LD A,FFH       3EFF    ;SET ALL BITS=1
122C      LD (HL),A       77      ;WRITE/READ
122D      LD A,(HL)       7E
122E      CALL 03C3H     CDC303 ;DISPLAY RESULT
1231      NOP            00      ;DO NOTHING
1232      JR DUF2        180E

1234      LD DE,OK       113D12
1237      CALL 0015H      CD1500 ;GIVE THE GOOD NEWS
123A      JP 006AH       C36A00 ;BACK TO MONITOR

123D OK: DB 11,4F,2E,4B,0D ;"OK"

1242 DUF2: LD B,09H      0609    ;LOOP COUNTER
1244      CALL 000CH     CD0C00 ;NEW LINE
1247      XOR A          AF      ; ALL BITS=0
1248      SCF            37      ;SET CARRY=1
1249 CONT: PUSH AF        F5      ;SAVE IT
124A      LD (HL),A       77      ;WRITE/READ
124B      LD A,(HL)       7E
124C      CALL 03C3H     CDC303 ;DISPLAY RESULT
124F      CALL 000CH     CD0C00 ;PLUS A SPACE
1252      POP AF         F1      ;RECOVER ORIGINAL
1253      RLA            17      ;SHIFT LEFT
1254      DJNZ CONT      10F3    ;TEST NEXT BIT
1256      XOR A          AF      ;FIND THE CHIP! CLEAR FLAGS FIRST
1257      LD A,80H        3E80    ;SET BIT 7 ONLY
1259      LD B,08H        0608    ;8 BITS PER BYTE
125B CHIP: PUSH AF        F5      ;SAVE TEST PATTERN
125C      LD C,A         4F      ;COPY IT TO C
125D      LD (HL),A       77      ;WRITE TO RAM
125E      LD A,(HL)       7E      ;READ IT BACK
125F      AND C          A1      ;ISOLATE TEST BIT

```


Sharp Users Club - General Section - RAM Checker

```

1260      NOP                00
1261      JR 2,SHOW          2811      ;FOUND THE FAULT!
1263      NOP                00
1264      NOP                00      ;SPARE
1265      LD A,C              79      ;PICK UP ORIGINAL
1266      CPL                2F      ;FLIP THE BITS
1267      LD (HL),A           77      ;WRITE/READ IT
1268      LD A,(HL)           7E
1269      AND C               A1      ;ISOLATE TEST BIT
126A      JR NZ,SHOW         2008      ;FAULTY NOW?
126C NEXT:POP AF            F1      ;PICK UP ORIGINAL
126D      RRCA              0F      ;ROTATE THE BIT
126E      NOP                00
126F      DJNZ CHIP          10EA      ;TEST THE NEXT CHIP
1271      JP 006A            C36A00      ;BACK TO MONITOR

1274 SHOW:CALL 0006         CD0600      ;NEW LINE
1277      LD DE,DATA         11A812      ;"BIT"
127A      CALL 0015H         CD1500      ;GIVE MESSAGE
127D      LD A,B             78      ;B= THE LOOP COUNT 1-8
127E      DEC A              3D      ;BITS ARE 0-7
127F      CALL 03C3H         CDC303      ;DISPLAY BIT NUMBER
1282      CALL 0006H         CD0600      ;NEW LINE AGAIN
1285      LD DE,DAT2         11B012      ;"BANK"
1288      CALL 0015H         CD1500
128B      LD A,H             7C      ;WHICH BANK?
128C      CP 50H             FE50
128E      JR NC,TES2         3007      ;GO IF NOT BANK 1
1290      LD A,01            3E01      ;BANK 1 = 1000-4FFF
1292      JR DISP            180D      ;GO DISPLAY IT

1294      NOP                00
1295      NOP                00
1296      NOP                00      ;SPARES
1297 TES2:CP 90H             FE90      ;BANK 2?
1299      JR NC,TES3         3004      ;GO IF IT'S BANK 3
129B      LD A,02            3E02      ;BANK 2
129D      JR DISP            1802

129F TES3:LD A,03           3E03
12A1 DISP:CALL 03C3H        CDC303      ;DISPLAY FAULTY BANK NUMBER
12A4      JR NEXT           18C6      ;GO TEST NEXT CHIP

12A5      NOP                00
12A6      NOP                00
12A8 DATA:DB 20,42,49,54      ; " BIT:  "
                3A,20,20,0D
12B0 DAT2:DB 20,42,41,4E      ; " BANK:  "
                4B,3A,20,0D
END.
```

PS I'll send a copy of this program to the club library, but if you would like your own copy on tape, then I will gladly send you a copy by return. Please enclose cheque for £2.50 to cover costs of cassette, Post & Packing etc.

My address if you have any comments, or would like the program on tape is: 3, Moorfield Drive, Wilmslow, Cheshire, SK9 6DL

PPS No responsibility can be accepted for any damage you may do to your machine or yourself as a result of following this article!

MODIFYING "DISKETTE COPY" TO COPY ANYTHING

By Maurice Hawes and John Edwards

Every Sharp Master Disk contains a "DISKETTE COPY" routine of some kind; but on all except the latest machines the routine is inhibited in some way when it encounters a master disk. On the MZ-80K the routine will not copy a master disk at all; on the "A", "B", and "700(K&P)" disk systems, the routine will copy a master disk, but the copy is modified to a "sub-master" and cannot be used to make further copies. On "700(SHARP)" and "800" systems, DISKETTE COPY appears to be uninhibited.

In the early years of the Club, members devised ways of modifying DISKETTE COPY on the "K", "A" and "B" to produce exact copies of master disks. This was not done to circumvent the copyright laws, but only to ensure peace of mind over backups. These early modifications could not be permanently installed, as they were designed to create masters, and would not copy other discs correctly; so it was necessary to instal the modifications on a temporary basis, every time a master copy was needed. A breakthrough was made by Tim Cowell (Vol.6 No.2 pp.47-48) with his 1-byte modification to the MZ-700(K&P) version of DISKETTE COPY. Tim's modification, which ensures that any disk will always be copied exactly, may be installed permanently.

The "A" and "B" versions of DISKETTE COPY are very similar to the MZ-700(K&P) version, and we have found that Tim's solution applies equally well to them, the only difference being the location of the byte to be changed. The "K" version of DISKETTE COPY is quite unlike the other versions, but John has found a way of achieving the desired effect with two 1-byte changes of a radically different nature. The details are as follows:-

"700" DISKETTE COPY (K & P)	change \$13B9 from \$20 to \$18
"A" DISKETTE COPY (SA-6510)	change \$1455 from \$20 to \$18
"B" DISKETTE COPY (SB-6510)	change \$13E3 from \$20 to \$18
"K" DISKETTE COPY (SP-6015/7011)	change \$30C0 from \$77 to \$00 and change \$30CB from \$77 to \$00

COPYING WITH SINGLE DISK DRIVES

The MZ-700 K&P Disk Basic Manual makes it quite clear that DISKETTE COPY may be used to copy from DRIVE 1 to DRIVE 1. As a result of a query from member Jac van Schoor in South Africa, we recently discovered that DISKETTE COPY on the MZ-80A and the MZ-800 may also be used in this way, even though it is not mentioned in either of the respective Disk Basic Manuals. Just enter "1" in response to both "DRIVE NO. -" prompts, and follow the instructions about swapping disks VERY CAREFULLY!

This single-drive copying facility is not provided with DISKETTE COPY for the MZ-80K; if you have only one drive on your MZ-80K, you should use one of John Edwards' single-drive copying programmes, as mentioned on p.22 of this Magazine.

By Eric Stanley and Maurice Hawes

The essential code for "BOX", applicable to SP-5060, was given by Eric in Vol.7 No.3 (pp.24-25). Since then, we have both been working on the command for other interpreters, and have succeeded in getting "BOX" working in SA-5510 and S-BASIC.

"BOX" IN SA-5510

This was relatively easy. All we had to do was change any addresses within SP-5060, to suit SA-5510. The resulting code is very similar to the SP-5060 "BOX" listing on page 25 of Vol.7 No.3, but with the following changes:-

1) In the initialising section at CEEA-CEFFH, the address CF00H must be put at 1BFA-FBH, and the new keyword BOX must be put at 1634-36H. Also, in the last instruction of this section, change the warm start address from 1274H to 1250H.

2) In the main BOX code at CF00-CF61H, change 19A9H to 1E88H (twice), change 1398H to 14A2H (4 times), change 169AH to 17A0H (once), and change 19B5H to 1B38H (once).

"BOX" IN S-BASIC

This was more difficult, mainly because it was necessary to switch the video DRAM in and out at the appropriate points in the code. The assembly listing is therefore longer than the other versions, and is further complicated by the fact that S-BASIC uses its own MONITOR-IN-RAM. Furthermore, if you wish to make a copy of S-BASIC with BOX permanently incorporated, the changes have to be made with the entire code sitting at an address 1200H higher than that at which it finally runs.

Eventually, after much correspondence, Eric managed to modify his own already personalised version of S-BASIC, with "BOX" permanently incorporated as one of many new features. Eric has written some instructions for this version of S-BASIC; if you would like to try it, write to him at 35 Cavendish Avenue, New Malden, Surrey, KT3 6QH, enclosing a blank tape, return postage, and an extra 30p for photocopying.

Maurice adopted a different approach and, with the help of Eric's results, finished up with a modifier programme which can be loaded and executed from the MONITOR-IN-ROM, after an unmodified copy of S-BASIC has been loaded in at 1200H but not executed (see Vol.6 No.2 pp.42-43 if in doubt about how to do this). This procedure creates a version of S-BASIC, sitting at 1200H and containing BOX in place of LET, which may then be saved, using the MONITOR-IN-ROM "S" command, from 1200H to 7D9FH and executing at 7D79H (i.e. S12007D9F7D79). When loaded normally, this version of S-BASIC will switch itself down to its proper location at 0000H, with the BOX command code at 2D00-2D6EH i.e. just above the start of the spare space in S-BASIC. If you would like a copy of the modifier programme, send Maurice a blank tape and return postage

AT HIS NEW ADDRESS AS GIVEN IN THE CLUB NEWS PAGES OF THIS ISSUE.

DISKEDIT for the MZ-80K, MZ-80A and MZ-700

By John Edwards and Maurice Hawes

If you do not have a utility which can directly modify specific disc sectors, editing a disk file can be rather tedious, as it involves loading the whole file into memory, invoking a co-resident monitor programme to actually edit the file, and then re-saving the complete file on disk. Moreover, the re-save involves specifying the file parameters all over again from scratch, and a different filename must be used unless the disc has been changed. Worst of all, this form of editing cannot be applied to the main disk Basic system file on a Sharp master disk, because the edited copy will not be saved on the correct tracks.

All these problems may be avoided if you have a direct editing programme which allows you to read, display, edit, and rewrite a chosen disk sector. There are other, more sophisticated, uses for direct disk editing once you have learned how to do it; for example, to recover a disc which has been accidentally corrupted, or to modify a disc directory in some way, or to create a master disc which boots up with your favourite object file.

Direct disk-editing programmes vary in complexity, but they all allow you to edit a selected disk sector directly, and provide hard-copy of the sector being processed. They may also display the character equivalents of the byte values so that messages may be recognised. MZ-80K owners have the DISKEDIT programme under Q-DOS, written by R.Beckhaus in 1982; MZ-80A owners have Jac van Schoor's SECTOR R/W programme, and MZ-700 owners have Tim Cowell's DISK NIBBLER. Not surprisingly, these three programmes work in somewhat different ways and we therefore decided to have a go at producing a common programme which would run in the same general way on all three machines.

We decided to base our programme on the MZ-80K DISKEDIT utility, mainly because of the easy way in which it can be used to browse backwards and forwards through adjacent sectors, and because it provides the option of ASCII or DISPLAY character equivalents. We began by modifying the MZ-80K version to provide more prompts and messages, alternative Sharp and ASCII printer drivers, and a printer dump of the one-sector 128-byte screen display in 80 columns instead of 40 columns (to save paper). Having finalised the MZ-80K version, we then rewrote the disk-handling routines to suit the MZ-80A, and modified the display to show each 256-byte disk sector in two consecutive halves. Finally, we produced an MZ-700 version, which was similar to the MZ-80A version but had an extra printer option for the MZ-700 plotter/printer.

The three resultant programmes are called DISKEDIT.K2, DISKEDIT.A2, AND DISKEDIT.702 respectively (the .K1, .A1 and .701 versions existed for a short while, but are now obsolete). The standard set of commands is explained on the next page. Note that, in order to use the programmes to full advantage, the earlier notes on directory information provided by Geoff Jones (MZ-80K, Vol.5 No.3 p.37), Jac van Schoor (MZ-80A, Vol.7 No.3 p.43) and Tim Cowell (MZ-700, Vol.6 No.2 p.47) are still invaluable.

DISKEDIT COMMANDS

When first loaded, DISKEDIT prompts for the Drive (1-4), Track(0-69) and Sector(1-16) to be examined. In fact, the whole of the specified track will be loaded into memory, but only 128 bytes will be displayed immediately (representing all the specified sector on an MZ-80K, but only the first half of the specified sector on the other machines). Then, at the bottom of the screen, you will be offered the following options:-

- E - EDIT sector on display. The cursor will move to the top line, which may then be edited by overwriting, with full cursor control. NOTE however that any line which has been changed MUST BE CONFIRMED with CR, to alter the relevant bytes in memory. To exit from EDIT, enter any non-hex character (we use "Q" for QUIT but any letter H-Z will do), then CR.
- W - WRITE sector to disc. This command will replace the current sector on the disc, with the current sector from memory.
- # - Copy screen display to printer in 80 columns. The first call to the "#" command asks for the type of printer being used, which is thereafter assumed to remain the same. On an MZ-80K, the printout represents the current sector. On the other two machines, the printout represents the current half-sector, with the title above (1st half) or below (2nd half).
- ! - Return to Monitor.
- A - Show ASCII character equivalents
- D - Show DISPLAY character equivalents
- F - move FORWARD one sector (or half sector)
- B - move BACKWARD one sector (or half sector)

The following undisplayed options are also available:-

- HOME - move to first sector of current track
- SHIFT/F - move to first sector of next track
- SHIFT/B - move to first sector of preceding track

SHIFT/BREAK - return to DRIVE, TRACK and SECTOR prompt sequence.

A WARNING is displayed if you try to leave the current track without saving sectors which you have edited. You are then given the option of staying in the track and saving edited sectors, by moving to them in turn and using the "W" command, or leaving the track, as you wish.

If you would like a copy of DISKEDIT for your own machine, send a blank tape and return postage to John Edwards at the address below, remembering to specify clearly which machine you are interested in:-

John Edwards
Oaken Figgeries, Holyhead Road, Codsall
Wolverhampton, West Midlands WV8 2HX

A MACRO-ASSEMBLER FOR SHARP COMPUTERS

By Peter Tuffs

The S.U.C. Magazine for October 1984 (Vol.4 No.3 pp.24-31) described my Z80 macro-processor programme. This was a prototype for my full-blown Macro-Assembler, Editor, and Monitor programme, written in 1985. Essentially this new tape-based programme was designed to allow the development and testing of Z80 Assembly language programmes with minimum effort. In many respects it has facilities superior to other standard Assemblers; passes 1 and 2 may be done in isolation, programmes do not need to be complete because errors do not terminate assembly, and there is full screen editing and provision for printer support.

Recently, after obtaining disk drives for my MZ-80K, I produced a disk version; this provides a directory listing, loading and saving source and object files on disk, and disk sector handling.

I have written a very comprehensive Instruction Manual of 21 pages, and both tape and disk versions for the MZ-80K and the MZ-700 are now available to members of the S.U.C. who provide their own blank media, for the cost of photocopying plus carriage. Maurice Hawes already handles ZEN.DOS, 8800 and DIS.COM under such arrangements, and I am happy that he should do the same for my Editor/Macro-assembler. For details, see Maurice's note below.

Highlights of the programme are a full function editor with on-screen update and control of such features as assembly, execution, string search, trace, and file handling. Also full hexadecimal update of memory or registers from the screen.

The Assembler provides for all the usual Z80 mnemonics, plus LOAD, DB, DS, DW, END, ORG, and EQU. Comments may be freely used, and when not required may be stripped out. The Macro-Assembler recognises MAC, ENDM, IF, FI, EXIT, DEF, ANOP and JUMP. Sample Macros are given, with examples of each type of macro-instruction and sample outputs. Macro expansion may be traced if required.

The tape version ("M 7.4.2") will run on the MZ-80K or the MZ-700. The disk version ("ED-ASS") has been tested on the MZ-80K, and the MZ-700 fitted with a "K" disc card and drives.

**** Editor's Note ****

In this case the photocopying will cost a little more than usual, due to the number of pages. Therefore, in order to make sure that the Club does not lose money, Peter and I have agreed that a charge of £3-00, to cover photocopying and return postage, would be reasonable. If you would like a copy of "M 7.4.2" or "ED-ASS" with its Manual, send a BLANK TAPE OR DISK AND A CHEQUE FOR £3-00, payable to the Sharp Users Club, to Maurice Hawes,

AT HIS NEW ADDRESS AS GIVEN IN THE CLUB NEWS PAGES OF THIS ISSUE.

Note also that the "ED-ASS" disk comes with the QDOS operating system and two additional new files; CLUB MON 5.24 (which has a sector read routine), and TYPE V1.9 (which is a utility for typing out ASCII files, such as ASM source files). *****

Edited by Andrew Ferguson
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The fundamental premise of this section is that there are at least a few members who have just acquired a second-hand Sharp and are in the process of finding out what they can do with it. Tom Heeps, who runs our Micromart (available to non-members too) tells me that the going price for an MZ-80K is about £50, so there should be someone out there who has just bought one, and is trying to make sense of that strange "BASIC" manual that comes with it. With a bit of guidance the manual provides a reasonable lead into learning Basic; at least it has the advantage of being written specifically for Sharp Basic. I'll now try to provide the guidance.

Choice of interpreter

The first thing is *not* to use the original SP-5025! The fact that it offers no way to pause the LISTING, and no repeat on the cursor keys, makes it an infuriating interpreter to use. Its far better to use SP-5025.K2, which was well documented in Vol.7/1; its available from me, or from Tom Heeps, as per normal Library practice. 5025.K2 only has one minor bug, as mentioned in Vol.7/2 p.17.

Good as the 5025.K2 interpreter is there are some advantages in using the latest versions of SP-5060, namely 5060 VME and 5060 VME EPSON. To use SP-5060 you really need the instructions that go with it; they were published in the April 82 edition of the magazine: the instructions are on two sides of a single page; if you send off to Maurice Hawes for SP-5060 VME, or to me for SP-5060 EPSON, (again as per normal Library practice) you can ask us for the 5060 instruction page (for no charge).

The SP-5060 interpreter is essentially that described in the original instructions, with all bugs removed, and a PRINT@ X,Y facility added. The full story of the updating is covered in Vol.5/1 p.19 and Vol.7/2 p.21-24; however mostly this is technical background information, and it is not necessary to know it to use the interpreter. It is important for Newcomers to realise that 5060 is in most respects similar to 5025.

The Sharp BASIC special keyboard mode

The strange Janglais translation and copious misspellings of the BASIC manual are bad enough, but perhaps the worst shortcoming of the manual is its total failure to explain the fact that a special keyboard mode is switched on and off by typing <"> quotes), and also that the same keyboard mode is switched on by use of the insert key. I'll try to explain. When <"> are first used they change the keyboard mode so that the cursor controls no longer operate as cursor controls, but PRINT cursor control codes instead. The keyboard remains in this mode until either <"> are typed again, or CR is pressed. Using the insert key also changes the keyboard mode, but in this case the number of times that the

insert key is used determines the number of times that the cursor controls will be used to PRINT control codes before the keyboard automatically reverts to normal mode (i.e. the cursor control keys become effective again).

Formatting numbers and putting them into STRING VARIABLES.

Numbers often need to be printed out either to screen or printer with a set accuracy, say corrected to two decimal places. Moreover when dealing with a series of figures, which have a varying number of digits before the decimal point, then in order to achieve a tidy print out it is desirable to pad out, with spaces, the smaller numbers, so that the figures line up neatly. In Xtal 3 Basic there is a command <FMT J1,J2> which allows this to be done with ease. This is described in the Xtal manual as follows: "Formats numeric output, for PRINT statements or STR\$ functions. The expressions <J1> and <J2> set up the number of figures to be printed in front of and behind the decimal point respectively. If the actual number of figures in front of the decimal point is less than that specified, leading spaces are used, while overflow will cause a default output in scientific notation. Trailing zeroes are always printed (except in the 'normal mode', see below), so that the output may be shown right-justified." The "Normal mode" referred to is FMT0,0; with this set, if the number is an integer then the decimal point is suppressed and there will be no trailing zeros. The point to note for our purposes is that when the requirement for trailing digits is set as zero, then we need to suppress the decimal point. To give a different example of the FMT system, with FMT4,3 set, "3.1416" would print as < 3.142>; note that the decimal place has been rounded up correctly.

There are a number of Basics which have a 'PRINT USING' command, to assist print out to screen or printer. However this does not ease the problem of storing numbers in STRINGS in a tidy way such that the STRINGS can be easily sliced up again; as the Xtal quotation makes clear the FMT command *does* satisfy this requirement. Now let's look at how all these things could be achieved in SP-5025 and 5060 with a subroutine. Well we won't go the whole hog; defaulting to scientific notation if insufficient leading spaces have been set is a refinement that we can manage without!

The main program will need to specify the number of Leading and Trailing digits by setting VARIABLES. To try to keep the more common VARIABLES available for general use, slightly unusual VARIABLES have been used; thus L7 sets the Leading digits, and T7 the Trailing digits. Note that if, for example, '-121' is the number that you want formatted then L7 would require to be 4 in order to allow for the minus sign. The number to be formatted is put into a temporary store N7 and then passed to the subroutine, which returns the number as a STRING, N7\$, suitably formatted. The use of the subroutine is demonstrated by LINES 10-70. The demonstration program stores the same weight in both imperial and metric figures in the same STRING; it is hard to see that this would make sense in practice, as one can be calculated from the other; nevertheless it adequately demonstrates the need to sometimes round out to a required accuracy.

At this point I must make an admission. This subroutine started out as one of my own. I treated the digits before and after the decimal point separately. The subroutine below is a much neater alternative provided by Geoff Childs. He reduced my 9 LINES to 4. There are a few interesting points in the subroutine which can best be covered LINE by LINE.

500 What this line is doing can best be seen by an example. Suppose that $T7=3$, in other words we want 3 digits after the decimal point, and suppose $N7=23.1237$. As 10 to the power 3 equals 1000, a value within the brackets of $23123.7 + .5$ would result: thus the integer would be 23124. So we now have all the numbers we want, correctly rounded off, and all that remains is to insert the decimal point. Note that 10 raised to the power 0 equals 1; so this formula also covers $T7=0$.

510 If $L7 + T7$ is greater than the number we have just established then its clear that leading spaces are needed.

520 If $T7$ is set to 0 the number must require to be stored as an integer so no decimal point is required.

VARIABLES used are:-

L7 Required number of leading digits.

N7 Temporary store for number to be formatted.

N7\$ The STRING version of the number after formatting.

T7 Required number of trailing digits.

The demonstration program also uses $N, WT\$(), W1, W2, W3$, but the purpose of these is fairly self-evident.

Below is a LISTING and on the next page a screen dump from RUNNING the demonstration program, with some sample figures being ENTERED. The first weight to be chosen in the example is 219 Lbs, 15 ounces, which shows quite clearly why 220 Lbs is a maximum; namely because as only 2 leading digits have been allowed for storing the weight in kgs there is no digit space for higher weights. A 'proper' program would of course have a validation check that prevented unacceptable INPUTS.

```

10 REM * Demonstration use of 5025/5060 formatting subroutine.
15 PRINT "ENTER weight, first the lbs (max 220) then the ounces."
20 CLR: DIM WT$(2)
25 INPUT "Lbs " ; W1
30 L7=3: T7=0: N7=W1: GOSUB 496: WT$(N)=WT$(N)+N7$
35 INPUT "Ounces " ; W2
40 L7=2: N7=W2: GOSUB 496: WT$(N)=WT$(N)+N7$: REM Note T7 is already set.
45 W3=(W1+W2/16)*.454: L7=2: T7=3: N7=W3: GOSUB 496: WT$(N)=WT$(N)+N7$
50 PRINT "Weight=" ; LEFT$(WT$(N),3) ; " Lbs, " ; MID$(WT$(N),4,2) ; " ounces, " ;
55 PRINT RIGHT$(WT$(N),6) ; " kgs."
60 N=N+1: IF N<3 THEN 25
65 PRINT "The information is currently held as:- "
70 FOR N=0 TO 2: PRINT WT$(N): NEXT: END
495 REM *****
496 REM * 5025/5060 subroutine for formatting numbers into STRINGS.
497 REM Send from main program - L7 to define leading digits (i.e. in front
498 REM of decimal point); T7 to define trailing digits; N7 to hold number to
499 REM be formatted. Subroutine returns N7$ as the formatted STRING.
500 N7$=STR$(INT(N7*10+T7+.5))
510 IF LEN(N7$)<L7+T7 THEN N7$=" " * N7$: GOTO 510
520 IF T7=0 THEN N7$=LEFT$(N7$,L7): RETURN
530 N7$=LEFT$(N7$,L7)+"." + RIGHT$(N7$,T7): RETURN

```

ENTER weight, first the lbs (max 220)
then the ounces.

```
Lbs 219
Ounces 15
Weight=219 Lbs, 15 ounces, 99.852 kgs.
Lbs 12
Ounces 3
Weight= 12 Lbs,  3 ounces,  5.533 kgs.
Lbs 130
Ounces 4
Weight=130 Lbs,  4 ounces, 59.134 kgs.
The information is currently held as:-
2191599.852
 12 3 5.533
130 459.134
```

As already mentioned Xtal has no need for the subroutine as it contains the PMT command. However it may be instructive to see what the same demonstration program looks like WRITTEN in Xtal 3:-

```
15 CLS: PRINT"ENTER weight, first the lbs (max 220)  then the ounces.":
PRINT: CLEAR: DIM WT$(2): IOM5,0
25 INPUT"Lbs ";W1: FMT3,0: WT$(N)=WT$(N)+STR$(W1): INPUT"Ounces ";W2:
FMT2,0: WT$(N)=WT$(N)+STR$(W2)
35 W3=(W1+W2/16)*.454: FMT2,3: WT$(N)=WT$(N)+STR$(W3)
50 PRINT"Weight="LEFT$(WT$(N),3)" Lbs, "MID$(WT$(N),4,2)" ounces, "
RIGHT$(WT$(N),6)" kgs."
60 N=N+1: IF N<3 THEN 25: ELSE IOM5,1
65 PRINT"The information is currently held as:- "
70 FOR N=0 TO 2: PRINT WT$(N): NEXT: END
```

It is of course more concise than the 5025/60 version. A further point arises in that Xtal 3 normally prints a leading space when printing out the number held in a VARIABLE. This leading space sometimes has advantages as it allows space for a minus sign; thus some Basics incorporate it as a standard feature. Xtal 3 is flexible; though there is normally a leading space this can be switched off with the command IOM5,0, and restored with IOM5,1. With IOM 5,1 set, as well as the leading space being printed, a leading space will be stored if the number is converted into its STRING equivalent. Thus for this particular demonstration program, in which there are no minus signs, it is better to do without the leading space. This is done by setting IOM5,0 in LINE 15; the normal IOM5,1 is restored in LINE 60.

PRINT USING for the MZ-700

There was another routine supplied by Geoff, namely 'PRINT USING' for the 700. It contains some noteworthy ideas, such as an easy conversion for Display codes, in the range 0-41, to their ASCII equivalent. However as it concerns the 700 I cannot make any very useful comments on it; moreover I have insufficient room left on this page for the LISTING, which needs about 14 lines including some notes, and I'm trying to keep this contribution to four pages, so if any 700 owners would like further details of PRINT USING then please write to me. **

Edited by Maurice Hawes
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MZ80K News

As the Editor of the Magazine as a whole, and purveyor of back issues and other sundry items such as ZEN.DOS and DIS.COM, I naturally receive quite a lot of correspondence. Much of it indicates that members are reasonably happy with the way the Club operates, but I recently received a very pleasant but firm complaint from an MZ-80K owner, that he felt that MZ-80K non-disk users were being "a little neglected".

Looking through the most recent issues, it is certainly true to say that the number of pages devoted to the MZ-80K is a smaller proportion of the whole than it was in, say, 1983; and that those pages have recently carried a high proportion of disk material. This general trend is probably inevitable, given the number of models which were marketed after the MZ-80K, and tendency for really enthusiastic Sharp addicts to obtain disk drives whenever they can do so at a reasonable price.

Nevertheless, we do try very hard to maintain some sort of balance between tape and disk in the different sections of the Magazine, and the MZ-80K tape Library is still the largest of all our libraries by a long way. Also, looking through the Magazines for 1986 and 1987, I see that the MZ-80K section has contained articles for the tape user on "SHARP PENCIL", "XTAL 3.1K", "SA-5510", "Z80 MACHINE", "SP-5025.K2", "80-COLUMN DISPLAY", "SP-5060 EPSON", "NEW EPROMS" and "BOX".

There have also been many appropriate articles in the "General" section; to name but a few, "PROBE", "BAS MOD", "C.P.E. HI-RES", "BA00", and "RTTY". In addition, the "Notes for Newcomers" section usually contains a great deal of material which is applicable to the MZ-80K tape user. All in all, I think we can claim that MZ-80K tape users are not really being neglected.

I must admit that, in the last three issues, MZ-80K disk users have done rather well; but this is purely a reflection of the material sent in. We are very fortunate that, in Peter Tuffs and John Edwards, we have two dedicated and super-enthusiastic MZ-80K addicts. Without them, the MZ-80K section (and the Magazine as a whole) would be much the poorer. Fortunately, their interests do not exclude tape, and I am sure that any analysis of their articles over a reasonable period would show this to be the case.

In the end, it all boils down to the fact that we can only publish the material we receive. The Magazine is kept alive by regular contributions from a relatively small proportion of members, and the remedy for that is in your own hands. If you have a specific problem, or have discovered something which you think may be of interest to other members, or have written a programme which you find useful, let us know about it in writing!

BITS AND BITS AND PIECES

By John Edwards

During the past 4 months the following odds and ends have come to light; none worth a full page, but Maurice thought they ought to go in somewhere:-

MZ-80K TAPE DRIVE CONTACT CLEANING

Like others before him, Maurice was having trouble with the tape buttons on his MZ-80K; sometimes they worked first time, but sometimes they didn't, which is very annoying. The answer is to clean the spring-loaded contacts which are located beneath the recorder; lift the lid and look just behind the recorder pulleys, in the middle of triangle enclosed by the belt; operate the PLAY button and you will see the contacts move. The best way to clean them is to put a few drops of contact cleaning fluid on a piece of white card, insert it between the contacts, operate the PLAY button, and move the card to and fro. Repeat until the card remains perfectly clean.

SUPERDISK 1D AND SUPERDISK 2D

I have modified my MZ-80K single-disk copying programme (see Vol.7 No.2 p.25) so that it will now copy onto an UNFORMATTED disk. I have also written a similar programme for those with dual drives. The new programmes are called "SUPERDISK 1D" and "SUPERDISK 2D", and may be obtained from me direct, or from Alan Bunting. Usual blank tape and return postage, please.

SP-7011 BUGS

There is a bug in the DIR routine of this interpreter. The code at 4A25H is D2H, and should be changed to D1H.

The second "bug" appears only in the original English version of SP-7011; the boot command "FDA" was not removed altogether, as we first thought, but was changed to "FDK", and this command, from the Monitor, causes this interpreter to boot up into the defined-keys routine. In the latest English version of SP-7011 the command "FDA" has been reinstated, to retain compatibility with the French version.

ZEN.DOS DIRECTORY TRACKS

In Vol.7 No.3, on p.29, Peter Tuffs implied (by default) that ZEN.DOS has 3 directory tracks (1,2 & 3). In fact there are only 2 directory tracks (1 & 2), and track 3 is used for programmes.

ZEN.DOS "SQUEEZE"

I find ZEN.DOS irritating when it puts my latest listing in a directory gap left by deletion. I have therefore written a ZEN.DOS programme called "SQUEEZE", which compacts the directory so that the next entry will automatically be put at the end. Blank tape or disk, plus postage, please, if you want a copy.

ZEN_FORM_FEED_MODS

I use an Epson MX-80 Mk.III printer with the special Sharp graphics chip. At switch-on this initialises with 1/8" spacing, 80 lines p/p, 1" skip-over; but on receiving 0FH this changes to 1/6", 60 lines p/p (Basic sends 0FH at the start of a listing).

For long ZEN listings I suppress all form feeds (1762H = 00H) and set the page length to 78 lines (185BH = 4EH), so that, with the initial MX-80 settings at switch-on, I get lists of 80 lines per page (including page numbers) at 1/8" spacing, and automatic skip-over in place of form feeds.

However, for general use I have rewritten the standard ZEN (or ZEN.DOS) printer routine to suppress the form feed on page 0 but leave other form feeds intact. This requires the printer to be preset to 1/6" line spacing and no skip-over. The routine just fits in the area for ZEN EXT (1757H-178FH), and is given below.

```

1757  F5      PUSH AF          ;** Sharp printers need 0FH at
1758  AF      XOR A            ;176BH, but 0CH can remain at
1759  CD7717  CALL 1777H       ;175EH (must match 1739H/197AH).
175C  F1      POP AF
175D  FE0C   CP 0CH           ;look for form feed **
175F  2008   JR NZ,1769H      ;send character if not form feed
1761  3AD712  LD A,(12D7H)     ;check page number
1764  B7      OR A
1765  2802   JR Z,1769H       ;if page 0 then send null
1767  3E0F   LD A, 0CH        ;otherwise send form feed **
1769  D3FF   OUT (0FFH),A
176B  3E80   LD A,80H
176D  D3FE   OUT (0FEH),A
176E  07      RLCA           ;LD A,01H in one byte!
1770  CD7717  CALL 1777H
1773  AF      XOR A
1774  D3FE   OUT (0FEH),A
1776  C9      RET

1777  C5      PUSH BC
1778  4F      LD C,A
1779  DBFE   IN A,(0FEH)
177B  E60D   AND 0DH
177D  B9      CP C
177E  280E   JR Z,178EH
1780  CD440A  CALL 0A44H
1783  20F4   JR NZ,1779H
1785  C1      POP BC
1788  32C712  LD (12C7H),A
178B  C32B13  JP 132BH

178E  C1      POP BC
178F  C9      RET

```

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S-DOM Documentation.

by Peter Tuffs

This documentation refers to S-DOM (Disk-Operating Monitor) Version 1.1 1982, Knight's TV & Computers Programmed by S. Sogou. It is distributed on SUC Disk Library Volume 107 and a copy of the disk is available from Alan Bunting the Club disk librarian. The S-DOM system accomplishes many of the tasks which a systems programmer would require to do in setting up a complete system disk. For the seasoned assembly language programmer it is almost indispensable.

S-DOM is a utility disk operating system. The features allow the user to create masters, patch disk sectors and load in files from tape to disk.

The dos recognises the following as valid devices :-

\$CMT	Cassette Tape
\$LPT	Line Printer
\$FDn	Floppy Disk Drive n

The repertoire of commands is :-

RENAME	a disk file is given another file name.
MASTER	Write a file to the boot tracks of a disk to make this program boot-up automatically.
UNLOCK	Set lock/unlock flag to off, ie allow DELETE.
DELETE	Deletes file if not LOCKed.
DUMP	Takes a designated sector, dumps it to the screen and allows it to be updated and written back.
DATA	Outputs file header information from cassette or disk files.
LOAD	Loads a file into memory from cassette.
LOADS	Loads a designated sector into memory.
SAVE	Saves memory to a named file on cassette or disk.
SAVES	Saves 128 bytes of memory to a disk sector.
XFER	Moves files between disks and cassette.
LOCK	Set lock/unlock flag on, ie DELETE cannot take place without UNLOCK.
COPY	Copies master and slave disks.

DIR	Outputs the disk directory, showing file type and file name.
BYE	Jumps to address 82H (Monitor warmstart).
MAP	Lists out the disk File Allocation Table (FAT).
M	Dumps out memory in hexadecimal and in ASCII.

Certain of the commands if followed by "/P" will action their output on the line printer. These commands then utilise the full 80 columns of the printer not the 40 as on screen.

"/P" commands are :-

DUMP/P	DATA/P	DIR/P	MAP/P
M/P			

A number of commands may be typed on the same line, eg :-

DIR MAP

Will cause the directory to output followed by the FAT

The dos recognises the following file types :-

01	OBJ	Object file (machine code)
02	BTX	Basic Text (Basic program)
03	BSD	Basic Sequential Data file
04	BRD	Basic Random Data file

all others are not identified and treated as "01".

Command Formats.

(1) RENAME

Format is RENAME "file 1","file 2"
or RENAME \$FDn "file 1","file 2"

File 1 name is replaced by File 2 name.

The state of the lock/unlock flag is not altered. Locked files may be renamed.

Eg RENAME \$FD1 "SP-5025","BASIC"

(2) MASTER

Format is MASTER \$FDn "file 1", \$FDn
or MASTER addr, \$FDn
or MASTER , \$FDn
or MASTER \$CMT, \$FDn

The file designated is loaded onto the boot tracks and the loader program is given the correct load and execution

addresses for this program to boot in. In the second format a tape file is written to the boot tracks of \$FDn and its load address is addr.

Eg MASTER \$FD1 "EMMA DISK V1.3", \$FD2

(3) UNLOCK

Format is UNLOCK \$FDn "file 1"
or UNLOCK "file 1"

The file designated is unlocked and may now be DELETED.

Eg UNLOCK \$FD2 "WORDPRO 1.8"

(4) DELETE

Format is DELETE \$FDn "file 1"
or DELETE "file 1"

The file if UNLOCKed is deleted from the disk. If it is locked the message "WRITE PROTECT" is output.

Eg DELETE \$FD1 "SP-5025 BASIC"

(5) DUMP

Format is DUMP \$FDn t,s
or DUMP t,s
or DUMP/P \$FDn t,s
or DUMP/P t,s

The sector of 128 bytes designated by track t, and sector s is dumped to the screen or printer in hexadecimal and ASCII. The screen dump may be overtyped to update the sector. A most useful disk patching facility.

Eg DUMP \$FD2 04,01

(6) DATA

Format is DATA \$FDn "file 1"
or DATA "file 1"
or DATA
or DATA \$CMT
or DATA \$CMT "file 1"
or DATA/P \$FDn "file 1"
or DATA/P "file 1"
or DATA/P
or DATA/P \$CMT
or DATA/P \$CMT "file 1"

The file 1 header details are output to the screen or printer. Files may be on cassette tape or disk. If no device

is specified and no file 1 then the dos assumes cassette, else disk is assumed.

Eg DATA/P \$FD2 "LX"

(7) LOAD

```
Format is  LOAD $FDn "file 1"
or          LOAD "file 1"
or          LOAD $FDn "file 1" addr
or          LOAD "file 1" addr
or          LOAD
or          LOAD $CMT
or          LOAD $CMT "file 1"
or          LOAD addr
or          LOAD $CMT addr
or          LOAD $CMT "file 1" addr
```

The file 1 file is loaded into memory at its start address as specified in its header or at addr. LOAD without operands loads from cassette. Execution does not take place. To execute enter BYE and then GOTOS from Monitor.

Eg LOAD \$FD2 "TEST" 2000

(8) LOADS

```
Format is  LOADS $FDn addr,t,s
or          LOADS addr,t,s
```

The 128 byte sector specified by track t and sector s is loaded into memory from addr onwards.

Eg LOADS \$FD2 2000,04,01

(9) SAVE

```
Format is  SAVE $CMT "file 1" add1,add2,add3,add4
or          SAVE $FDn "file 1" add1,add2,add3,add4
```

The file 1 is saved to tape or disk from memory starting at address add1 and ending at add2. add3 specifies the load address for execution, and add4 the execution address. If add2, add3 and or add4 are not present the add1 is used. If add4 is not present it is assumed to be the same as add3.

Eg SAVE \$FD2 "DATA TABLE" 2000,2FFF,6000,0000

(10) SAVES

```
Format is  SAVES $FDn addr,t,s
or          SAVES addr,t,s
```

The 128 bytes of memory starting at addr are written to disk at track t, sector s.

Eg SAVES \$FD1 1200,30,01

(11) XFER

Format is XFER \$CMT,\$FDn
 or XFER \$CMT "file 1", \$FDn "file 2"
 or XFER \$FDn "file 1", \$CMT
 or XFER \$FDn "file 1", \$CMT "file 2"
 or XFER \$FDm "file 1", f\$FDm "file 2"

The file 1 is transferred to file 2, combinations of \$CMT and \$FDn are allowed.

Eg XFER \$FD2 "COMPOBJ4.COM", \$CMT

(12) LOCK

Format is LOCK \$FDn "file 1"
 or LOCK "file 1"

File 1 is locked against DELETion.

Eg LOCK "WORDPRO 15"

(13) COPY

Format is COPY \$FDn, \$FDm
 or COPY , \$FDn

The whole contents of the disk in drive \$FDn are copied to the disk in \$FDm. If the second format is used then the contents of a first disk in drive \$FDn are copied to a second disk in the same drive with commands to change disks as required, 10 slabs are required.

Eg COPY \$FD1, \$FD2

(14) DIR

Format is DIR
 or DIR \$FDn
 or DIR/P
 or DIR/P \$FDn

The directory for \$FDn is displayed on the screen or printer.

Eg DIR/P \$FD2

(15) BYE

Format is BYE

Control passes back to the monitor warmstart at address 0082H.

Eg BYE

(16) MAP

Format is MAP
or MAP \$FDn
or MAP/P
or MAP/P \$FDn

The command causes the file allocation table of drive \$FDn to be output on the screen or printer. A one indicates a sector is allocated, a zero that it is free. The screen version allows the FAT to be updated and written back to disk.

Eg MAP \$FD1

(17) M

Format is M
or M addr
or M/P
or M/P addr

Memory is dumped in hexadecimal and ASCII to the screen and printer. The screen output allows update. The output starts at memory address addr. When no address is specified the last address plus 128 is used, or if the first time a value of zero.

Eg M 1200

S-DOM Module Map.

The various routines start at the following addresses :-

Command	Address in hexadecimal		
RENAME	B50F	MASTER	BE8E
UNLOCK	BF8F	DELETE	BF83
DUMP	B6A6	DATA	B718
LOAD	B826	SAVE	B9A7
XFER	B03A	LOCK	BF8E
COPY	C0AD	DIR	B3C3
BYE	0082	MAP	BC45
M	B5A4		

Edited by Andrew Ferguson

on behalf of



Library News

Chief Librarian Tom Heeps.

For the benefit of new members the first issue of each year needs a recap of our Library. Reprinting the complete Library list would use too much space; the last list, dated 13th Oct. 1986, appeared in Vol.6/1 pp.21-27. There are some points to note about it (as well as the amendments) but before going on to comment on it I'll repeat the procedure for obtaining Club Tapes: just send a description of your requirements, together with a blank tape and return postage, to the relevant Librarian.

The Library list

There is a section in the list headed "Programs on 'Special Request'". Any of these programs can be requested by applying either to myself or Tom Heeps as per the usual procedure for Library Tapes. SP-5025.K2 is also now on this list (see Newcomers section for this, and also SP-5060VME and SP-5060VME EPSON). Also available to members, but outside the Library are Robert Tanswell's Disassembler 'BA00' and 'BBB0 MASTER', but for these see Vol.7/2 p.12.

As announced in Vol.6/2 p.30, the old Tape 37 has been withdrawn and is replaced by the following:

Tape 47: Z80 MACHINE.K2/S; Z80 MACHINE.K2/M; Z80-A200.K2/S;
Z80-A200.K2/M; CLUB MON.K3/S; CLUB MON.K3/M

Further information about these appeared in Vol.6/2 p.34 and Vol.7/1 p.15.

A new Tape 76 has been issued containing the programs to produce MZ-80A Data tapes from MZ-80K Data tapes and Disc Files. These programs are discussed by Alan Bunting in Vol.6/2 p.17; they require documentation, so consult Vol.6/2 p.30 before sending off to him for them. The programs on the tape are as follows:-

Tape 76:6015 BAS->80A; 6015 TESTPRDG; 5025 BAS->80A; 5025 TESTPRDG

It is of course Alan Bunting who is in charge of the MZ-80K disc library. The disc library list appears in Vol.6/2 p.30.

Librarians

Our faithful Librarians remain unchanged. Note that though the list includes the 'A' Librarians (Ian Baldwin and Don Cram), the MZ-80A library is now entirely separate.

Software Information Bulletins

A number of our members contributed a considerable effort in bringing these Bulletins to fruition. Recently there has not been much call for them, so Tom and I have decided that you can dispense with the £4 deposit that we used to require: merely send the 3 second class stamps for return postage and we will send you whichever Bulletin you ask for.

List of 'K' & 'A' Librarians

<u>Librarian</u>	<u>Tape No.</u>
11 Mr T.P.Heeps ¹ (Tom - 052 98316 - 7-10 pm 7 days a week) 19 The Crescent, Raueby Hospital, Sleaford, Lincs. NG34 8PR	
21 Mr J.Rees (John) The Cottage, Woodside Avenue, New Longton, Preston, Lancs. PR4 4YD	1-5:57:58 11-15
31 Mrs B.Hodgson (Barbara) 50 Waterdale, Sutton Park, Hull, Humberside. HU7 6DH	
41 Mr I. Baldwin. (Ian - 0785 55461) 27 Sherwood Avenue, Stafford, ST17 9BX	All 'A' tapes
51 Mr F.Mardell (Frank) 77 St.Andrews Rd, Henley on Thames, Oxon. RG9 1PH	16-20
61 Mr C.S.Wright B.Sc (Christopher) 19 Redwood Glen, Chappletown, Sheffield. S30 4EA	21-23:25
71 Mr D.Crae (Don - 0934 636204 - afternoon & evenings) Step Aside, 19 St Nicholas Road, Uphill, Weston-S-Mare, BS23 4XE	26-35, 1A, 2A
81 Mr L.Panrucker (Leslie -0778 425480) 41 Westwood Drive, Bourne, Lincs. PE10 9QH	1-10:36-40
91 Mr G.R.Long (Geoff. - 0908 679 666 - before midnight!) 14 Braunston, Woughton Park, Milton Keynes, MK6 3AU	41-45
101 Mr I. Edwards (Ian) 11 High Meadow, Washingborough, Lincoln. LN4 1SE	46-50:61-63:65
111 Mr A.Newgrosh (Anthony - 061 428 7710) 5 Delaware Road, Gatley, Cheshire. SK6 4PH	51-55
121 Mr L. Avery (Leslie- Torquay (0803) 37146) Garden Close, Greenway Road, St. Marychurch, Torquay. TQ1 4NJ	56
131 Mr J. Edwards (John - Codsall (090 74) 5273) Oaken Piggeries, Holyhead Road, Codsall, Wolverhampton, W. Mid. WV8 2HX	66
141 Mr J.Treayne (John - 0633 893371) Mylor, 12 Forge Lane, Bassaleg, Newport, Gwent.NP1 9NF	67-68
151 Mr A.Ferguson ² (Andrew - 0491 574850) 11 Harcourt Close, Henley-on-Thames, Oxon. RG9 1UZ	24:64:69:75
161 Mr A. Bunting (Alan - 0786 75516. Tape 76 req.20p+p.&p.) 28 Pelstream Avenue, Stirling, FK7 0BE	76 & all discs.

*

SENIOR LIBRARIAN

Tom Heeps.
19 The Crescent,
Raueby Hospital,
Sleaford,
Lincs. NG34 8PR



* List revised *
* 20th Feb. 1988 *

In event of complaint please contact Tom Heeps. All programs sent to the Club Library must include adequate documentation. Tom Heeps also runs a Sharp 'Microwart'; he is willing to help anyone with Sharp equipment to exchange irrespective of whether they are members of our Club.

=

ASSISTANT TO SENIOR LIBRARIAN

Responsible for most of the documentation covering the Library, as it appears in this magazine, and shares with Tom responsibility for the 'Special Request' programs, and for sending out Software Information Bulletins 1 and 2.

MZ-80K DISK LIBRARIAN

Alan Bunting

28 Pelstream Avenue

Stirling FK7 0BE

Tel. 0786-75516 (After 9 p.m. please)



Things have been very quiet since the last issue. My pleas for library material and de-bugging help have gone largely unanswered and, were it not for some programs from Alan Cockett and considerable efforts by John Edwards, I'm afraid that there would have been precious little on offer this time around.

The most interesting and exciting news is that John Edwards has produced 'Superdisk'. This program will copy any format MZ-80K disk, including FD05 and WDPRO, using single (Superdisk 1) or double (Superdisk 2) drives, and both versions are now in the Library as Volume 111. An added and time-saving bonus is that it is not necessary to format new disks before copying. Beware, though, you MUST use SP-6815 to run these programs - they will not work with variants such as SP-7811 etc.

Thirteen programs have been added to Volume 18 which almost qualifies it as a new volume so I have listed its entire contents, but that, I'm afraid is it. I still have a few programs awaiting de-bugging, translation from German or needing revised layouts etc. but little else. In hand is a disk version of 'Kaeon's Dungeon' complete with Game Save to disk routine but it is minus instructions. Can anyone provide a set, particularly what keys H, F, B and C are used for so that it can go into the Library?

As far as the next issue is concerned, I cannot see much on the horizon, so may I make a suggestion for someone to take up? There are a good many program listings in back issues of our own Magazine, and of Sharpsoft User Notes, which do not appear on Library disks. It occurs to me that someone may have typed these in, or has copies? If so, could you let us have them please?

Additions to the library:

Volume 18 - (Complete) - Serendipity; Black Box; Encounter;
Pin-Ball; Roadrunner; Target Pong; Basketball; Squash;
Alderbaron; Zombie Island; Piracy; Starmission;
Rebel Attack; Swordsmen; Dragon Dungeon; Camelot;
Laser Defence; Cosmiad Mk.2

Volume 111 Superdisk 1; Superdisk 2 (Copy anything, 1/2 Drives)
No formatting required. Use ONLY with SP-6815

Requests for Library material should be for whole volumes, accompanied by disks, return postage etc. Formatted disks preferred but not essential.

XXXX For complete Library list send 4 x 18 p stamps. XXXX

PORTING PROBLEMS WITH DIFFERENT VERSIONS OF CP/M

By Maurice Hawes

DIS.COM (see Vol.7 No.3 p.34) runs under Sharp CP/M 2.2 on the MZ-80A/B. I recently decided to "port" it on to an EPSON QX-10, for which two versions of CP/M are available (2.2 and 3.1). My MZ-80A does not have RS232, so I did the "porting" by typing in 6000 or so bytes by hand under Epson CP/M 2.2. Given my typing ability, I was not entirely surprised that DIS.COM did not run correctly first time; but after checking that my typing was in fact "byte perfect", I was perplexed. Rather hopefully, I tried the programme under 3.1. To my amazement, it ran almost perfectly!

The problems under Epson 2.2 were chiefly with the screen display, and it soon became obvious that these were caused by differences between the CONOUT codes. I discovered that neither of the two versions of 2.2 was standard in this context, whereas Epson 3.1 is, I believe, standard. To illustrate this point, the relevant parts of the CONOUT control code sets are listed below:-

CODE	EPSON 3.1	SHARP 2.2	EPSON 2.2
05H	CLEOL	-	CLEOL
07H	BELL	BELL	BELL
08H	BS	BS	BS
09H	TAB	TAB	TAB
0AH	LF	LF	LF
0BH	CURSOR UP	CURSOR UP	HOME
0CH	CURSOR RIGHT	CURSOR RIGHT	CLS
0DH	CR	CR	CR
0EH	-	INSERT CHR	-
0FH	-	INSERT LINE	-
10H	-	DEL CHR	-
11H	-	DEL LINE	-
12H	-	CLEOL	-
13H	-	CLEOS	-
14H	-	CR/LF	-
15H	-	BOS	-
1AH	CLS	CLS	CLEOS
1BH	ESC	ESC	ESC
1CH	HOME	-	CURSOR RIGHT
1DH	-	-	CURSOR LEFT
1EH	HOME	HOME	CURSOR UP
1FH	CR/LF	-	CURSOR DOWN

It is clear from the above that the Sharp 2.2 set contains the standard set, but with CLEOL moved, and several additions; whereas the Epson 2.2 set is standard only for CLEOL, BS, TAB, LF AND CR. In this instance the main problems arose from codes 0BH and 0CH. Under Sharp 2.2 and Epson 3.1 these move the cursor up and down; but under Epson 2.2 they do HOME and CLS. No wonder I had screen problems! Another minor difficulty was the absence of Sharp's DEL CHR in the Epson versions; I solved this by using CLEOL.

I hope these notes may help you to port CP/M programmes between Sharp and other machines. There was one other very obscure problem with Epson 2.2 which I should perhaps mention; the standard BIOS call to 0005H under this version of CP/M corrupts IX and IY. This may not be typical, but shows that you can never assume that CP/M is the same on all machines!!!

Edited by
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MZ80R News

SP-5868.A1 EXECUTION HALT - Maurice Hawes

Following his work with Andrew Ferguson on input routines, Greg Chapman realised that there was a potential problem in my conversion of SP-5868 for the MZ-88A. Execution of a program run under SP-5868.A1 can be halted by pressing either SHIFT key. Execution resumes by pressing any other key. This works because a keyboard check is included in the main execution loop in the interpreter. Using the SHIFT key to obtain lower case input through the INPUT statement does not halt execution because the interpreter is not running through the main loop at that point. However, Greg pointed out to me that if an input routine is used of the type he and Andrew had been working on, using the GET statement, the interpreter remains in the main loop and execution will halt if an attempt to obtain lower case input is made. Although I have not fully tested this, I believe I now have a solution. To change the HALT EXECUTION key to the CTRL key execute the following POKE (original value in brackets):

POKE 6637,128 (255)

SA-1518 SCREEN HANDLING BUG - Greg Chapman

Another in our occasional series of MZ-88A bugs! This one was discovered while using SA-5518, but further investigations suggest that it is caused by the SA-1518 MONITOR routines and not the interpreter itself, so will affect virtually any program.

You will discover that if you use the INST key (SHIFT+DEL) when the cursor is in the extreme right hand column of the screen AND that position is a space AND the cursor is not at the end of the first line of input which has spanned two lines, then the entire following 255 bytes are shifted right. You will find that once points on the screen (spanning two lines) have been established by INPUT, then those points continue to be recognised until the screen is cleared. When the cursor is at a point which meets the three conditions, holding down the INST key produces an effect which resembles rubbish being swept under a carpet, shifting the entire six and a half screen lines under the following characters on the screen. Unless you know better, there is no simple cure!

ON PROBLEMS AND PRINTERS - Greg Chapman

Since the last issue I have had a lengthy correspondence with one member who had a particularly obscure problem. The solution to his problem eventually emerged in three parts, two of which were caused by the printer.

It had not occurred to me that the samples of the "program error" which I was being sent were being produced on a printer which did not have its DIP switches in other than factory set condition. I realised that some members would require "line feed

on carriage return* switches altered, and that some would prefer slashed zeros, but not that other switches would have been altered without it being mentioned.

The second printer problem turned out to be caused by the fact I was producing output on an Epson RX-80, whereas my correspondent was using an FX-80. I had always assumed that the models were identical in the way that they responded to escape codes for expanded, condensed and other print sizes. However, they are not! It is true that the RX-80 manual refers to the need to send a right margin code, in order to get 137 characters per line in condensed mode. However, in spite of the manual, the RX-80 does NOT in fact require the right margin code to be sent, and it produces the full 137 characters per line on start-up, rather than the 132 characters per line suggested in the manual. I was to learn that the FX-80 DOES require that right margin code. Now this you might have thought was problem enough, but my correspondent did not even tell me which model printer he was using and had to be asked.

Once the solution emerged as it did, we both began to look somewhat foolish. For a number of reasons, I had convinced myself that my correspondent was altering the program in ways other than I was suggesting. He, knowing that this was not the case, and feeling I was barking up the wrong tree, failed to send me samples of the program's output in the form I was requesting. I was convinced that I understood the problem. He was convinced that the problem was in my understanding of the problem. He was right, of course, and when, eventually, he did send the program output in the form requested, the solution became obvious and I was forced to accept my error.

The moral of the story is, when seeking a solution to a problem, always give the fullest details of hardware, including interfaces, and software. Give precise details of exactly how you are responding to program prompts and what appears on the screen or printer. If possible, include a copy of the program or data on tape. I should then be able to duplicate the problem and so be able to find the solution.

TYPEWRITER MODE INPUT WITH CAPS LOCK - Greg Chapman

Yes, yet another input routine, intended to replace use of the INPUT statement. This version will normally give "typewriter mode" input, i.e. all alphabetic characters appear in their lower-case form unless SHIFT is held down. A further feature is a CAPS LOCK toggle, provided on the GRPH Key. The toggle will flip keyboard operation between typewriter mode, and the keyboard's normal configuration of upper-case letters, with SHIFT for lower-case. As with all the input routines which have been published in the magazine over the last couple of years, it is intended to be used to prevent unacceptable input being made, by disabling certain keys. The main reason for publishing the version below, for which the BASIC code is very similar to one of the routines published in Vol.7 No.2, is to introduce the machine code routine, which is a more efficient version of that published in Vol.5 No.1.

(See next page)

The machine code should be loaded as part of the initialisation of the program in which it is used. The following four lines of BASIC will do this.

```
1000 LIMIT53213:FORI=53213TO53246:READJ:POKEI,J:NEXT
1010 DATA 205,179,9,24,0,254,0,40,18,254,27,56,8,254,128,56,10
1020 DATA 254,155,56,4,203,255,24,2,203,191,205,206,11,50
1030 DATA 255,207,201
```

The main part of the routine works by building up a string, ST\$. Should numeric input be required, it will be necessary to convert ST\$ to a numeric variable by using VAL(ST\$). The routine uses the following variables internally:

```
SL Length of ST$
RU Loop counter (Repeat/Until)
CH ASCII value of last keypress
CH$ Character represented by CH.
```

Before calling the routine it is necessary to set the values of three further variables:

```
MN Minimum acceptable ASCII value for input
MX Maximum acceptable value for input
ML Maximum length of input.
```

The code for the routine follows:

```
100 SL=0:ST$=""
110 FOR RU=1TO2 STEP0
120 USR(53213):CH=PEEK(53247):CH$=CHR$(CH)
130 IF CH=102 GOSUB200:GOTO190
140 IF CH=99 GOSUB240:GOTO190
150 IF CH=97 GOTO190
160 IF CH=96 GOSUB220:NEXT
170 IF(SL=ML)+(CH<MN)+(CH>MX)GOTO190
180 PRINT CH$;:ST$=ST$+CH$:SL=SL+1
190 NEXT:RETURN
200 IF SL>0 THEN RU=3:PRINT
210 RETURN
220 IF SL>0THENPRINT CH$;:SL=SL-1:ST$=LEFT$(ST$,SL)
230 RETURN
240 IF PEEK(53217)=22 THEN POKE53217,0:POKE53287,0:RETURN
250 POKE53217,22:POKE53287,198:RETURN
```

The references to POKE53287 in lines 240 and 250 are optional. Their function is to place and clear an inverse "C" in the top right hand corner of the screen, used as a visual indicator of whether the CAPS LOCK is engaged. The use of the POKE requires the screen not to have been scrolled since it was last cleared. It will be also necessary to call the following sub-routine every time the screen is cleared.

```
300 IF PEEK(53217)=22 THEN POKE53287,198:RETURN
```

XXXXXXXXXXXXXXXXXXXX

SA-5510 */T0* BUG? - Chris Hearn

If you try to save or load variables, with names beginning with the letter "0", using SA-5510's PRINT/T or INPUT/T statements you will have run into problems. To understand why this happens, you first have to know how a program is stored in memory. When you hit the carriage return key having typed in a program line, it is not transferred directly into the main part of memory from the input buffer. First the interpreter scans the line looking for any reserved words. Any that it finds are converted into tokens, a two byte code for that reserved word. In the case of a number of commands for which there is an optional suffix, such as */P* or */T* the suffix is NOT tokenised. Basic sees the statement PRINT/T 0B%(1) as PRINT / TO B%(1). You can check this for yourself if you write a one line program

```
10 PRINT/TOB(2)
```

and then load a disassembler to look at memory from 505C, you will see the following bytes:

0A	00	00	00	2F	9E	42	28
(LINE NO)		PRINT	/	TO	B		etc...

The simple answer is don't use variables starting with "0", which might get confused with "0" anyway!

XXXXXXXXXXXXXXXXXXXX

MZ-80A LIBRARIAN

Ian Baldwin

27 Sherwood Avenue, STAFFORD ST17 9BX

Unfortunately, there's not too much to report in this issue, but that is not because nothing is happening. I have just completed a major project at home, and should now have a little more time to devote to the library. Greg Chapman is also hoping to offer some assistance. By the next issue it is hoped to publish a revised library list and some more brief reviews. However, there is one area where we could do with some help.

HELP WANTED!

One of the things that long standing members will have realised about the first true MZ-80A library list published in Vol.7 No.2, is that a number of programs, which MZ-80K members have valued highly, did not appear in the list, inspite of details of conversions having appeared in a number of places. Some of the most important of these are Jean Labarthe's utilities, ASM 2001 or MAGNETO CO, for example. The reason they did not appear was quite simply that the copies which I received on taking over the Club Library, although labelled as MZ-80A versions, did not run. My skills were not up to the conversion work and so far no one else has come forward with working copies. If you have got MZ-80A working copies of any of the programs which appear on the latest MZ-80K library list, but not in the list in Vol.7 No.2 then I would like to hear from you. XX

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MZ80B News

For my first attempt at editing this section of the magazine, it would have been nice to have had some material from the membership TO EDIT, but that was not to be, so for this edition you will have to make do, mainly, with my own prosings.

Can we please start 1988 by collectively making ONE resolution, and it is this:-

That we each resolve to submit for publication at least ONE article ...the content and length of which is up to each individual; all I ask is that it be on a topic of interest to 'B' section members.

For example:-

1. Does anyone make use of the GRAPHIC capabilities of the 'B' in their own everyday use? ...if so share your discoveries with the rest of us.
2. Has anyone disassembled the disk controller routines? ...if so why not explain IN ENGLISH how they work, and even more important, how they can be used by a non-expert in machine code.
3. Has anyone managed to read disk formats other than Sharp?...if you have then we would all like to be told how to do so too!
4. Does anyone understand how to design printer drivers for Sharp and other printers?...then please explain the mechanism to everyone else.
5. Has anyone succeeded in connecting one computer with another, WITHOUT the intervention of MODEM and telephone lines?

There are surely many other topics about which little or nothing is or has been published, and which would make a useful article. (I'm NOT asking for ALL the answers, please think of such an article as a 'discussion document'...what one member finds foxing, may well be easily answerable by another.

REMEMBER, with the decline in numbers of SHARP accredited dealers in this country, the club and its members are probably the ONLY source of information about our superb machine...lets not keep such data to yourselves, let everyone share it!

The CLUB LIBRARY

I now have copies in my possession of all the 'B' library programs, and having had a try at most of the submissions, I can state that there are amongst them routines to meet all tastes, from games to machine-drawing, I have to say, however, that the one thing sadly lacking in many instances is detail about HOW TO

RUN THE ROUTINES EFFECTIVELY and most important, WHICH VERSION of Sharp BASIC they utilise. The library could certainly do with an injection of new material, should you have a routine of which you are particularly proud, or you find particularly useful, however complex or simple it may be, then please let the library have a copy (and remember to include a few lines in 80 column mode describing the version of BASIC and how to operate it).

For those of you who run CP/M, I can personally recommend the ZENASM, DISCMOD, and DIS.COM utilities available from Maurice Hawes at the very modest charge of TWO POUNDS (plus your own formatted disk, of course)...these are certainly the best CP/M utilities I've tried so far.

Turnround on library requests I expect to be 'return within two days of receipt of your request'....If you are running a disk system, it would be far easier for me to copy a complete disk (containing the material which you require) than to extract an individual program, but if one program ONLY is required, then that I will be happy to supply....Just send me a blank DISK or TAPE, a return address label and postage. An up to date listing of the programs in the library will appear in the next edition of this Magazine.

DAISYWHEEL PRINTERS

With the appearance on the market of one or two inexpensive DAISYWHEEL PRINTERS, I found myself casting envious eyes upon such advertisements, however, as usually happens, they all appear to require CENTRONICS INTERFACES. I thought that it might be a good idea to 'test the water' and determine whether or not a centronics interface is still available for the 'B'. I first turned to MILLS-HARRIS, (new address:- P.O. Box 165, CHELTENHAM GL53 9BR), who promptly replied that such interfaces for the 'A' & 'B' are no longer stock items, but that they would be prepared to produce them for 75 pounds per board + VAT but with a minimum order of 15 boards. I next tried PETERSON ELECTRONICS of FORFAR, who replied by return post (and get an 'A+' for customer relations for so doing!) that they still produce Centronics Printer interface and RS232 interface boards for the 'A' at a cost of 80 pounds and 134 pounds per board respectively + VAT (& that 'A' boards fit the 'B', but that any driver software provided would need alteration by the purchaser to suit)...so we have not been entirely forgotten.

Next, John Edwards sent me a copy of an article in Electronics Today International, march 1986, describing a circuit for converting RS232 signals into a Centronics interface, whilst in our own Club Magazine Vol.5 No.3, I found an article by 'Charles' describing how to convert the output from the Sharp universal I/O card to Centronics. So, if a Daisywheel printer would be your own delight, then whether you are a 'whizz' with a soldering iron or not, you COULD still indulge yourself!

IMPLEMENTING "SCRN\$(X)" as a FUNCTION in BASIC

by John Edwards and John Ibberson.

In an earlier edition of our Magazine, the article on a screen handler threw out a challenge to members to produce a machine code version of Xtal's SCRN\$() function for the Sharp Basics. It is thanks to John Edwards that we now have an entirely satisfactory resolution of this requirement; thus his name appears above as co-author: in fact he produced code for the M200K, and it has fallen to me to adapt this work for the 'B', which I have done with further help from both John, and Maurice Hawes. From the start, the different architecture of the 'B' kept getting in the way of success, partly, as it transpired, as a result of the bank switching of the screen RAM, and partly as a result of my own desire to place the routine as high in RAM as possible. As I eventually discovered, you can't access code in an AREA of RAM which you've just SWITCHED OUT!...the result was that all too familiar crash to monitor! (If, as it is said, one learns from mistakes, then I should certainly have gained some knowledge from this project.) The provision of AUTO-SELECT for the current screen size (i.e. 40 or 80 columns) was considered to be essential, and is provided in the versions presented below.

Do try SCRN\$() for yourselves, a lot of work has been poured into this extra function which can be a very useful addition to BASIC. A full explanation and demonstration of how to use SCRN\$() appears in SUC Vol.7 No.3 pages 45-46, and below I describe one very practical application:-

It is required to store, in a random access file, several variables aggregated into set positions in one string to maximise storage space in the file. (In a random access file, each declared variable is padded out to 32 characters, so the more of those 32 bytes used to store values, then the more efficient the use of space.) Lets take the simple case of a SURNAME, a DATE and a REFERENCE NUMBER. In standard SB-6510 the variables would be collected via INPUT statements, then allocated to the string to be written to file something like this:-

```
5 NM$="IBBERSON":DT=880210:NO=9
10 RR$=NM$:A=LEN(RR$):A$=SPACE$(23-A):REM PAD IT OUT TO 23 CHARS
20 RR$=RR$+A$:DT$=STR$(DT)
30 RR$=RR$+DT$
40 A=LEN(RR$):A$=SPACE$(30-A):RR$=RR$+A$:REM PAD TO 30 CHARS
50 NO$=STR$(NO):IF NO<10 THEN NO$=NO$+" "
60 RR$=RR$+NO$
70 A=LEN(RR$):IF A<>32 THEN PRINT "STRING IS WRONG LENGTH"
80 PRINT RR$:REM to random access file.
```

With a modified disk Basic USING SCRN\$(X)...simply print the variables on ONE SCREEN LINE & collect the line thus:-

```
105 NM$="IBBERSON":DT=880210:NO=9
110 PRINT CHR$(6):PRINT NM$:TAB(23):DT:TAB(30):NO:REM see **
120 RR$=SCRN$(0):RR$=LEFT$(RR$,32):REM SHORTEN IT TO 32 CHARS
130 PRINT RR$:REM to random access file
```

** In Sharp Basics, TAB(X) tabs THROUGH column X, not TO column X; so LINE 110 puts DT in columns 24-25 and NO in columns 31-32 !!

SCRN\$ allows a considerable saving of effort in achieving the correct placing of characters in the string to be used, particularly when you consider that no checking for length was necessary at each stage, and no provision needed for numbers greater than 9 taking up two character spaces .

The routines below add the function SCRN\$(X) to TAPE BASIC SB-5510 and DISK BASIC SB-6510, allow the user to allocate ONE COMPLETE SCREEN LINE of TEXT to a chosen string variable, and auto-adjust for the current screen size selected, i.e. either 40 or 80 columns. The syntax is:- X\$=SCRN\$(X) where X\$ can be any string variable, and X is an INTEGER from 0 to 24. (The uppermost screen line is line 0). 'SCRN\$(X)=' is checked for and IS NOT ALLOWED.

PROGRAMME FOR BASIC SB-5510

Load BASIC 5510 from tape...LOAD and RUN the following program:-

```
10 POKE 9670,118:POKE 9671,207
15 FOR J= 53110 TO 53228:READ A:POKE J,A:NEXT J
20 DATA 229, 33, 83, 67, 175, 237, 82, 40, 4, 225, 195, 74, 38,
225, 229, 62, 67, 43, 190, 32
30 DATA 252, 205, 137, 23, 254, 36, 40, 237, 254, 82, 194, 179,
19, 35, 205, 238, 23, 78, 225, 35
40 DATA 205, 214, 30, 205, 238, 23, 41, 229, 205, 138, 23, 254,
61, 202, 179, 19, 62, 24, 187, 218,
50 DATA 185, 19, 99, 106, 205, 86, 12, 1, 80, 0, 219, 232, 254,
51, 40, 3, 1, 40, 0, 17,
60 DATA 199, 17, 213, 197, 213, 243, 198, 128, 211, 232, 237, 176,
214, 128, 211, 232, 251, 225, 193, 65,
70 DATA 126, 214, 31, 48, 3, 62, 32, 119, 35, 16, 245, 54, 13,
209, 6, 1, 225, 126, 201
80 NEW
```

PROGRAMME FOR BASIC SB-6510

Load DISK BASIC SB6510...then LOAD and RUN the following program:-

```
5 POKE 10101,86:POKE 10102,207
10 FOR J=53110 TO 53228:READ A:POKE J,A:NEXT J
20 DATA 229, 33, 83, 67, 175, 237, 82, 40, 4, 225, 195, 249, 39,
225, 229, 62, 67, 43, 190, 32
30 DATA 252, 205, 167, 24, 254, 36, 40, 237, 254, 82, 194, 249,
19, 35, 205, 12, 25, 78, 225, 35
40 DATA 205, 17, 32, 205, 12, 25, 41, 229, 205, 168, 24, 254, 61,
202, 249, 19, 62, 24, 187, 218
50 DATA 255, 19, 99, 106, 205, 86, 12, 1, 80, 0, 219, 232, 254,
51, 40, 3, 1, 40, 0, 17,
60 DATA 199, 17, 213, 197, 213, 243, 198, 128, 211, 232, 237, 176,
214, 128, 211, 232, 251, 225, 193, 65,
70 DATA 126, 214, 31, 48, 3, 62, 32, 119, 35, 16, 245, 54, 13,
209, 6, 1, 225, 126, 201
80 NEW
```

Should you wish to make this function a permanent feature of DISK basic, then store it on your BOOT disk, and alter the 'AUTO-RUN' file to 'RUN' the above DISK VERSION under whatever title you may care to give it before 'NEW'ing.

COMMERCIAL CP/M SOFTWARE for the MZ80-B
by John Ibberson

One evening, member Brian Jones phoned asking if I knew of a commercial database which would run on his 'B'..alas I had to say 'no', but as a result of this phone call, I made enquiries of Messrs XITAN Ltd and Messrs GREYMATTER, and the results are quite encouraging!..fear not, if we can afford it, we are not forgotten. XITAN replied that they dealt only through dealers, but sent me the following list of programs which can be supplied in SHARP MZ80-B format to run under CP/M 2.2:-

WORDSTAR PROFESSIONAL 4	169.00 (all in Pounds + VAT)
CALCSTAR	99.00
SUPERSORT	145.00
DATASAR	175.00
MICROSTAT	329.00
ECO-C	150.00
XBASIC	185.00
dBASE 2	395.00
PRO-PASCAL	320.00
PRO FORTRAN-66	320.00
SUPERCALC 2	195.00
C BASIC COMPILER	395.00
ASSEMBLER + TOOLS	185.00
PASCAL MT+	295.00
XASM cross assemblers.	from 225.00

Xitan state that they would be pleased to inform anyone interested in these programs, of the address of the nearest stockist.

Messrs. GREYMATTER were even more helpful in that they sent me a 26-page catalogue of prices and programs for CP/M 80, CP/M 86 and MSDOS (they can provide material in SHARP MZ80-B format for CP/M80 (i.e.version 2.2)), and they will supply direct. The list is too long to set out in any detail, but the following will give you a flavour of its contents.

ALGOL	C-BASIC
VARIOUS Z80 ASSEMBLERS	Z-BASIC
M-BASIC	MEGA-BASIC
BBC-BASIC (THATS A SURPRISE!)	NEVADA COBOL
NEVADA BASIC	NEVADA PILOT
NEVADA FORTRAN	COBOL
VARIOUS C-COMPILERS	LISP
FORTRAN	DATASAR
LINKERS	SUPERCALC
dBASE 2	PASCAL (PRO, TURBO AND NEVADA)
WORDSTAR 4	

Should anyone want details and prices (which range from 30.00 pounds to 700.00 pounds), please either phone Grey Matter (0364 534499) or myself. I have always wanted to 'try out' FORTRAN, so when I found amongst this list 'NEVADA FORTRAN' at 35 pounds, I thought I'd try it. Promptly after placing the order, a CP/M disk appeared on my doormat along with a 200 page manual for this compiler. Having set up the 'install' file as direct in the manual, everything works well! (all the 'NEVADA' languages listed are similarly low priced.)

THE EXTRA COMMANDS IN SHARP DISK BASIC SB-6511

By John Ibberson

After my article about using SB-6511 with the RS232 board, in the last edition of this Magazine, it was pointed out to me that having given the EXTRA reserved words, I had omitted to state their syntax...sorry...I'll try again!

APPEND (FILENAME)...appends named file to program in memory.

The next command is the most complex

RSMODE (CHANNEL),(R+No of bits to receive),(T+No of bits to send),(M+Stop Bits+Parity)(69,70,71 = 1 bit odd,none,or even) or (73,74,75 = 1.5 bits odd,none,even) or (77,78,79 = 2 bits odd,none,even)), (Receive inactive/active (RX+0 or 1))

e.g. RSMODE A,R8,T8,M79,RX1

RSO (channel),(string data) e.g. to output via channel A, RSO A,T\$
RSI (channel),(string data) e.g. to input via channel B, RSI B,T\$

Subsequently, a copy of the Manual for the Universal I/O board came into my possession, explaining the remaining commands:-

ICL...interface clear.
REN...remote enable.
LCL...local (manual mode).
LCL (device No)...goto local device.
LLO...local lock out.
DCL...device clear.
DCL (device No)...clear selected device.
TRG (device No)...trigger remote device.
PCT (device No)...pass controll to device No.
WRT (device No), variable...write variable to device No.
RED (device No),variable...read variable from device No.
WRT/ (variable)...transmit variable data after device has been previously declared.
RED/ (variable)...reads variable after device has been previously declared.
CMDW (string variable)...transmits data.
CMDR (string variable)...reads data.
ON SRQ (line No)...jumps to line number after an instrument connected makes a service request.
SPDL (device No.),A...Serial Polling.
PPC (device No.),(data line No.)...parallel poll configure.
PPOL A...Parallel Poll.
PPU...Parallel Poll Unconfigure.
GPIBM (device No.)...sets 'the B' as system controller and allocates device No n to it.
EDIW (delimiter No.)...sets delimiter No for data transmit.
EDIR (delimiter No.)...sets delimiter for data receive.

Not possessing a Universal I/O card, I have no experience of using the commands listed above, and can only set out my interpretation of the instructions in the Manual..however, I hope that they will prove useful. *****

TWO MORE PROGRAMMES FOR THE MZ-80B (??)

By Maurice Hawes

1. MZ-80B TAPE BASIC SB-5520/SB-5530

SB-5520 was first mentioned in Vol.7 No.2, and I have now been able to examine it in some detail. The first surprise was that I could not use Tanswell's MZ-80B disassembler to help my research; all attempts to load it in memory above SB-5520 caused a fatal crash. Eventually, I discovered that the RAM Monitor section of SB-5520 (called SB-1520) is an extensively rewritten and larger version of SB-1510, in which all the principal SB-1510 routines are retained but many have been moved, and the Monitor flags and buffers are relocated (e.g. the tape header buffer is moved from \$10C0 to \$1140). As a result, any m/c programme written to suit SB-1510 is virtually certain to crash under SB-1520.

The interpreter section of SB-5520 appears to be essentially the same as SB-5510, though most of the code is relocated, to make room for the new Monitor (e.g. the keyword table has been moved from \$15B0 to \$1630, and S.O.F. from \$511C to \$515C). There are no new keywords, and I could find no other significant changes.

I finally listed SB-1520 by copying it to CP/M as an .OBJ file, and then disassembling it under DIS.COM. It seems that the main purpose of SB-1520 is to allow the REV, GRPH and SHIFT LOCK keys to toggle ON without SHIFT; this is certainly much more convenient than the normal arrangement but, unfortunately, the rewrite has completely messed up the REV and GRPH keyboards. I managed to sort out the code to keep the toggle on REV, GRPH and SHIFT LOCK but restore the REV and GRPH keyboards to normal, and saved the result as SB-1530/5530. If anyone would like a copy I can provide one (usual blank tape etc.); but on the whole I feel that both SB-5520 and SB-5530 are best forgotten, as it seems pointless to move many of the principal Monitor routines, and the flags and buffers, from their normal locations, to achieve such a trivial result.

2. A SPREADSHEET FOR THE MZ-80B ?

The Club recently acquired a tape which loads with the title "HUCAL 80B". From the layout of the initial display, it seems to be a professional-style 80-column spreadsheet, but without documentation we have not been able to find out how to drive it. John Ibberson and I are working on it, and have so far discovered that the "/" key switches the cursor out of the cell area into some form of command mode at the top L.H. corner of the screen, and that the commands may include ELSE, INPUT, SWAP, THEN, STOP, MEAN, SUM, MAX, MIN, COUNT, JUMP, CSAVE, CLOAD and INPUT; plus the usual range of mathematical functions (INT, SQR, ABS, SIN, etc).

If any member has documentation for HUCAL, or knows how to drive it, will he please contact John Ibberson or Maurice Hawes (for thier addresses and telephone numbers see p.3 of this Magazine).

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MZ700 News

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Modems

Following the request in the last magazine for someone to write Modem Software for the MZ700, I thought I would have a go. First I needed to connect a modem to my MZ700, I borrowed an appropriate modem from work and set about building a serial interface to connect it to. I then wrote some simple software which just sent characters to the modem from the keyboard and received characters from the modem and displayed them on the screen. The next step is to make the software a little smarter and easier to use, but wait until the next edition for that, this will give you plenty of time to acquire a modem and interface.

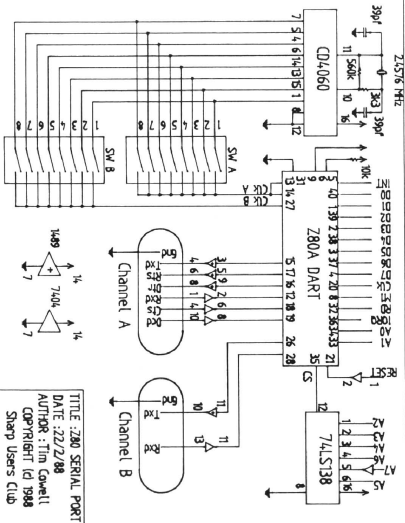
The interface was made compatible with the T03-DUAL RS232 serial link for the MZ700, as sold by Peterson Electronics. This means that anyone unable to build the interface for themselves can buy a ready made & working equivalent from Peterson Electronics. Their address is :-

Peterson Electronics Ltd.,
Academy Street,
Forfar,
Angus DD8 2HA

Tel. FORFAR 62591

Circuit

The circuit diagram for the serial interface is on the following page, it uses very few components, 5 chips, 3 resistors, 2 capacitors, a crystal, some switches and connectors. It offers two serial interfaces with switchable baud rates from 75 baud through to 9600 baud. I have designed the interface to provide one channel with full handshaking support for modems etc, and one channel with just transmit and receive data for non-intelligent devices like printers. This allows you to use a serial printer at the same time as the modem. If you require more handshake lines on the second serial port it is simply a matter of adding the drivers for them.



A standard RS232 interface provides drivers capable of switching at +/- 12v, however this is very complicated to do on an MZ700 because it only has a 5v power supply. I have therefore given the interface 5 volt drivers, these work with most modern serial devices and should not therefore be a problem. I have used mine successfully to connect to an IBM PC, a serial printer and a modem.

Parts

All the components required for the interface are available from MAPLIN electronics, their catalogues are readily available from leading newsagents and their prices are quite fair. I assembled mine on a piece of vero-board 148 by 74 mm, using the wire wrapping system with prototyping pen, wire spools and wiring combs. It is also advisable to use IC sockets for all the IC's because this makes repairs and testing very much easier. The voltage on all pins of the circuit can be checked before the ICs are plugged in, possibly preventing a very expensive mistake. The crystal is standard microprocessor crystal at 2.4576 Mhz.

Shopping List

- 1 * 280A DART & IC socket
- 1 * CD4060 & IC socket
- 1 * 74LS138 & IC socket
- 1 * 7404 & IC socket
- 1 * MC1489 & IC socket
- 2 * 39 pf capacitors
- 1 * 560k resistor
- 1 * 10k resistor
- 1 * 3k3 resistor
- 1 * 2.4576 Mhz Crystal
- 2 * 8 way dip switches
- 1 * vero-board
- 2 * 9 way 'D' type connectors (male)
- 1 * 50 way IDC card edge connector
- 1 * 50 way pcb transition header
- 1 * approx 1 ft by 50 way ribbon cable.

Connections

Connection to the MZ700 is made by a 50 way IDC Edge connector plugged into the Expansion port, a short length of 50 way ribbon cable into a 50 way pcb transition header soldered onto the interface. The pin numbers of the 50 way connector are given on page 141 of your MZ700 manual under the table P-11. Power for the interface can either be taken from the 4 pin internal plotter connector or one of the 5 pin joystick connectors.

The standard connector for serial interfaces is the 25 way 'D' type, however this is a bit on the large size and a better connector to use is the 9 way 'D' type. Many IBM compatible computers use this 9 way connector so this seems a reasonable decision, the pins used are :-

25 way pin No.	9 way pin No.	Name	Direction
8	1	= DCD Data carrier detect	- input from modem
3	2	= Rxd Received data	- input from modem
2	3	= Txd Transmitted data	- output to modem
20	4	= DTR Data terminal ready	- output to modem
7	5	= Gnd Common signal ground	
* 6	6	= DSR Data Set ready	- input from modem
4	7	= Rts Request To Send	- output to modem
5	8	= Cts Clear To Send	- input from modem
* 22	9	= Ring Indicator	- input from modem

Connections marked * are not implemented.

Technicalities

Baud rates are generated by the CD4060 which is an oscillator/counter, this provides 8 outputs which are various divisions of its 2.4576 Mhz input clock. By switching one of these outputs to the Z80A DART we can select the Baud rate. Switch A selects the channel A rate, switch B selects the channel B rate. It is important that only one switch 1-8 is closed at any one time. The switch settings are :-

Sw	1	2	3	4	5	6	7	8
Baud	75	150	300	600	1200	2400	4800	9600

The most common setting will be 1200 baud (switch 5 on), this is the baud rate of most low cost modems and printers.

These baud rates assume the Z80A DART is programmed for a clock rate of 16 times, which the sample software will use.

The IO addressing of the DART is as follows :-

Port Address	DART Register
BC	Channel A data
BD	Channel B data
BE	Channel A control
BF	Channel B control.

References

The Z80A DART is software compatible with the Z80A SIO, of which there are many references, most Z80 books give examples of using a Z80 SIO. A particularly good one is Z80 Applications by James W. Coffron.

Programming

Assuming you have made your interface or bought one from Peterson Electronics you will want to test it. This can be done quite simply in BASIC, although BASIC is not really going to be suitable for the final modem software because it just isn't fast enough ! To begin with we will try the interface communicating with itself, to do this connect pins 2 and 3 of the channel A connector together. Now type in the following BASIC program :-

```

1 AC=$BE:AD=$BC
2 GOSUB 1000
3 CLS
4 INP#AC,D:IF D>2*INT(D/2) INP#AD,D:PRINT CHR$(D);
5 GET A$:IF ASC(A$)<>0 OUT #AD,ASC(A$)
6 GOTO 4
7 END

1000 OUT #AC,$18      : REM RESET CHANNEL
1010 OUT #AC,$4       : REM SELECT REGISTER 4
1020 OUT #AC,$84      : REM 16 CLOCK, 1 STOP BIT, NO PARITY
1030 OUT #AC,$3       : REM SELECT REGISTER 3
1040 OUT #AC,$C1      : REM RECEIVE 8 BITS PER CHARACTER
1050 OUT #AC,$5       : REM SELECT REGISTER 5
1060 OUT #AC,$68      : REM TRANSMIT 8 BITS PER CHARACTER
1070 OUT #AC,$1       : REM SELECT REGISTER 1
1080 OUT #AC,$0       : REM NO INTERRUPTS
1090 RETURN

```

Line 1 defines the control register as address BE, and the data register as address BC. Line 2 calls the initialisation subroutine which programs the Z80A DART. Line 4 tests the DART to see if a character has been received by it, if so it reads the character into D and displays the corresponding character. Line 5 tests the keyboard, if a key was pressed it is sent to the DART which will transmit it. There should be a test before doing this to make sure the DART is ready, but we are relying on the fact that there is no handshaking and the DART can send faster than we can type.

To test channel B connect channel B connector pins 2 and 3, then change line 1 to 1 AC=\$BF:AD=\$BD

contd....

When you type characters at the keyboard they should be sent through the DART and displayed on the screen. If you have a serial device, ie a printer, you can try connecting to this, whatever you type will be sent to the device. You must however check that you are using the correct baud rate etc :-

MZ-700 Library

The MZ-700 library is still running quite nicely in the hands of Roy Houghton. Programs in the library are available FREE to club members and the following procedure should be followed to receive your copies :-

Send a blank tape and S.A.E to

Roy Houghton,
12 Bank Top Road,
Brecks,
Rotherham,
S65 3DY.

Tel 0709 543184 (Reasonable Hours)

State the name, and if possible the index of the program. Queries can be answered by telephone on the above number.

A full list of the programs available appeared in the last edition of the magazine.

Contributions to the library are eagerly sought, we only ask that they be free of any copyright restrictions. When contributing a program simply include an S.A.E and a list of programs you would like returned, your cassette can then be returned to you.

Whilst every effort is made to ensure that programs available from the library are either public domain or supplied with permission of the author, it is very difficult for us to fully check all programs. If you have reason to believe we are offering software which is unlawfully copied please contact Roy Houghton and it will be made unavailable.

Letters

Graphics Plotting

I have received a letter from William Howlett who asks for help with plotting a 3D picture of the Globe on his MZ700. He has a program written in S-BASIC with an example of the output, but the latitude lines do not fit correctly. I have been unable to assist with this, so if anyone out there is reasonably articulate with mathematics would they please contact me.

By Peter Tuffs, Maurice Hawes, and John Edwards

As reported in Vol.7 No.3, it now seems virtually impossible to purchase a new disk drive system for the MZ-700 (or the MZ-800) in the U.K. It may be possible to order specially from Germany or Holland, but this is far from easy and may be rather expensive.

Until The Club is able to sort out the problems with its own I/O box, it is worth noting that the MZ-80K I/O box can be used to run disk systems on the MZ-700. A special connecting cable is needed between the 50-way I/O connector on the MZ-700, and the 50-way socket on the I/O box lead; the electrical design for this is fairly straightforward and was first given by John Bedson in Sharpsoft MZ-700 User Notes Vol.2 pp.24-25. In brief, all except 4 of the 50 edge connections on the MZ-700 are connected straight through to the corresponding sockets on the I/O box. The other four (No.'s 17, 22, 30 and 50) MUST be left disconnected, as they are grounded in the MZ-80K system. The mechanical design of this lead is a bit of a problem, and we are currently experimenting to find the best method; by the time this Magazine is published we hope to be able to produce one for about £10-00.

Once you have the MZ-80K I/O box connected to the MZ-700, there are several possibilities. Peter uses an MZ-80K disk card, which fits straight into the box, with no modifications, and has found that he can run almost all MZ-80K disk software, which is a great advantage because there is an awful lot of it ! The disadvantages of this system are that disks are single-density (only 143k each), and that the software does not utilise the colour potential of the MZ-700. Peter uses Sharp disk drives, but we think that many other double-sided 40-track drives could be used without major problems.

An alternative is to use an MZ-80A disk card fitted with an MZ-700 F.D. eprom, in the MZ-80K I/O box. This is slightly more complicated, because the card has to be modified electrically, and a PCB adaptor is required to carry the extra circuits and allow the card to plug securely into the box. John Edwards has made a prototype PCB adaptor, and Maurice has been using it successfully for some months. The eprom, the modifications, and the PCB adaptor cost about £20 altogether. The advantages of this system are that disks are double-density (286k each), and that the MZ-700 colour commands are available. The disadvantage is that there is relatively little software available.

However, we have developed a composite MZ-700 F.D. eprom (for the MZ-80A disk card) which can be switched to load either K&P disk Basic, or Sharp 2Z-009E disk Basic. The K&P system uses the S-Basic RAM Monitor, and has a built-in converter for MZ-80A/B Basic programmes; the 2Z-009E system is more powerful, but uses an MZ-800 style RAM Monitor and cannot run MZ-80A/B Basic programmes. With our composite F.D. eprom, you can run either system at the flick of a switch.

John is currently working on ideas for an 80-column display on the MZ-700, and we hope to have something on this in the next issue. Meanwhile, if you would like to know more about MZ-700 disk system possibilities, contact Peter, Maurice, or John; their addresses appear on other pages of this Magazine.

SOME SUCCESSES AND SOME FAILURES

By John Edwards and Maurice Hawes



We are pleased to say that all of the problems mentioned in the last issue have gone away; needless to say, other problems have arisen in their place, but at least we have made progress.

First of all, we blew another copy of our composite K&P/SHARP F.D. EPROM for the MZ-700, using a brand new chip, and we now have a reliable MZ-700 disk system which can be switched between the K&P operating system, and the Sharp Z2-009E operating system, (see MZ-700 pages of this issue for further details). It seems that our problems were caused by re-using a tatty old Eprom.

Next, we blush for shame to admit that our problem with the P5/6 printer character Eproms was due to the fact that we were trying to use 2716's, and they should have been 2732's! Our confusion arose because the character Eprom in the P3 printer is a 2716, and we thought the P5/6 Eproms were the same type. We have now successfully copied a 2732 Eprom for a P6, and can do the same for anyone else who needs one, at £6-00 each; we have a full set of Sharp masters (MZ-BKPSR, MZ-BAPSR, MZ-EBPSR).

The final problem from last time concerned the Kuma MZ-80A 80-column modification. Member Doug Grout came up with a set of Kuma instruction sheets, and after they had been checked as correct by Dr. Brian Gladman, we sent out our first kit to Frank Barrow, as a trial. We are pleased to report that he was able to instal the kit without any major problems, and we now feel that we can offer the kit to other members, at £10-00.

This brings us to the new problems. First of all, suppliers are now telling us that ordinary 2716 eproms are no longer being manufactured. CMOS versions are still available, but we are not sure whether they are suitable, and in any case they are very expensive (about £8-00 each). We are looking into the possibility of modifying 2732 Eproms to suit, but there will inevitably be some delay in supplying copies of Jac van Schoor's rewritten character eproms for the MZ-80K/P3, and they may turn out to be more expensive than we thought. If anyone knows a cheap source of 2716 Eproms we would be very pleased to hear from them.

Finally, we have been looking more closely at the Club I/O Box project. We have a few boards which were inherited from Yeovil, but these are marked "MK II", and do not correspond exactly with the circuit diagrams given in Vol.3 No.1 p.30, and unfortunately we do not have a component overlay. We have two members working on the problem (Richard Phelps and Jac van Schoor), but if anyone out there has made up an I/O box from a Club PCB, and got it working successfully, we would be extremely pleased to hear the details.

Enquiries or suggestions regarding the above to Maurice Hawes

AT HIS NEW ADDRESS AS GIVEN IN THE CLUB NEWS PAGES OF THIS ISSUE.

(Prices for K/P3 Eproms will be quoted at the time of despatch)



Sharp Users Club