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SHARP USERS  
CLUB

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**NOVEMBER 1987**

**Volume 7**

**Number 3**

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#### APOLOGIES

The Editor apologizes for the late arrival of this issue, which was due to circumstances quite beyond our control. The art work was sent to our usual printer on November 2nd, and we were led to expect that the finished Magazine would be available around November 16th. Unfortunately, the printing company went into voluntary liquidation in the middle of November, but it was late on November 26th before we were finally informed that the job could not be completed.

Therefore, on November 27th we found ourselves back to square one; happily, after several frantic telephone calls, we managed to arrange for the Magazine to be printed quickly, and at a similar cost to the original quotation.

We are grateful to SPEEDYPRINT of Newark-on-Trent for coming to our aid in this extremely desperate situation.

To prevent any additional delays, this issue of the Magazine has been sent to U.K. members by 1st class post. Every overseas member will receive his copy by air mail, as usual.

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2nd November 1987

Another 28 members have joined since July, continuing the trend earlier in the year. It shows that the Club is still giving a valuable service, and we hope that you will all find something useful in these pages. Many of the Section articles (marked \*\*\* on the Contents page) contain points of general interest, so do read the whole Magazine, rather than just your own Section!

The Club has lost Geoff Wheeler as Treasurer; Geoff has performed the Treasurer's job with great efficiency ever since he took over from the old Yeovil Treasurer in 1985, and it is very largely due to his efforts that we find ourselves alive and kicking in 1987. We are most grateful to Geoff for all the very hard work he has put in, and hope that he will remain in touch with his old friends, whilst beaver away on his Macintosh.

John Duxbury took over as Treasurer on November 1st 1987; he has been keeping an up-to-date database of members' addresses for some time, so there should be no problems, as long as you send your 1988 subscriptions to him, as instructed on the pull-out subscription form at the centre of this issue. Please do not wait for 1988 to arrive, we do need to know how many members we have before we can even start planning Volume 8. We are holding the subscription unchanged, at £6-00 U.K., £9-00 Overseas, and we hope to produce three issues, of the same quality as at present, in March, July and November 1988.

John Ibberson is taking over as MZ-80B Sub-editor for Volume 8, so if you have any MZ-80B contributions, send them to John Ibberson from now on; he is also taking over as MZ-80B Librarian. In addition, there are one or two other minor changes (addresses, telephone numbers), so please read the Club News and Librarian lists in this issue very carefully before writing or telephoning with information, queries, or Library requests.

Happily, there are one or two new faces in this issue, with some very informative articles. But we would love to see more new contributors, especially in the MZ-80A, MZ-80B and MZ-700 Sections. Please don't be shy, even a small practical tip, or a simple question, can lead to a tremendous amount of spin-off for other members. I cannot make this point too strongly; you would be amazed if you sat where I do, at the developments which often arise from apparently simple suggestions or enquiries.

Vol.7 No.3 represents a milestone in the Club history, of which I think we may be justly proud. The Yeovil organisation, to whom we must always remain grateful for starting the Club and setting such high standards, produced three volumes of the Club Magazine in professional style (Volumes 2, 3 and 4). We in the "new" organisation have now done the same (Volumes 5, 6, and 7). Pull out the centre pages and send your 1988 subscription to John Duxbury straight away, so that we can continue the good work!!

\* Vol.8 No.1 will appear in March 1988, deadline 20/2/88 \*



### New Club Treasurer

Geoff Wheeler has found that other demands on his time make it impossible for him to continue as Club Treasurer. JOHN DUXBURY has therefore taken over as the new Club Treasurer, as from NOVEMBER 1st 1987. This should not create any administrative problems, as John has been keeping his database up-to-date on the basis of information supplied to him by Geoff, and has been printing the labels for the Magazine envelopes for the past year. John will continue to act as the Club Records Holder.

### New MZ-80B Sub-editor and Librarian

Obviously, we could not ask John Duxbury to act as Treasurer and Records Holder, and also find time to be MZ-80B Sub-editor and Librarian. JOHN IBBERTSON has therefore volunteered to become MZ-80B Sub-editor and Librarian, and his address appears below.

### Software Manuals I and II (see Vol.5 No.3 pp 35-36)

We have recently heard from Brian Thomas (who was Club Co-ordinator in Yeovil days), that he has no Software Manuals left. We have therefore arranged for more copies to be printed, and these are now available from Maurice Hawes, at the slightly lower prices of £1-50 each or £2-50 for the two, including P&P (please add 50p if overseas). Cheques etc. should be made payable to the Sharp Users Club.

### Club Correspondence

In view of the above changes it will be necessary to alter the Club set-up for correspondence as outlined in the previous issue. Therefore, from the publication of this issue onwards, please address your correspondence as follows:-

- 1) All subscriptions and queries regarding subscriptions, and all letters notifying a change of address, should be kept separate from other correspondence, and should be sent to the Treasurer, John Duxbury.
- 2) All queries regarding the delivery of Magazines, or orders for back issues of the Magazine or Software Manuals, together with remittances, should be sent to the Chief Magazine Editor, Maurice Hawes.
- 3) All correspondence arising from Magazine articles should be sent to the Sub-editor listed at the top of the relevant section of the Magazine, or to the Chief Editor.
- 4) All requests for Library programmes should be sent to the appropriate Librarian.
- 5) All requests for information about the systems used by other Club Members should be sent to the Club Records Holder, John Duxbury.
- 6) All other correspondence should be sent to the Club Secretary, Andrew Ferguson.

## Sharp Users Club - General Section - Club News

In view of the important changes on the previous page, a complete list of up-to-date addresses for all Club officials is reprinted below. Please note that in addition to the above changes, Peter Tuffs has a new telephone number, and Tim Cowell has moved (but his telephone number is still the same):-

### CLUB COMMITTEE

#### Club Treasurer/Club Records Holder

John Duxbury, 52 Kendal Street, Barrow-in-Furness, Cumbria LA14 5HH  
Telephone 0229 37853

#### Club Secretary/Newcomers Section Editor

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#### Chief Magazine Editor/MZ-80K Section Editor

Maurice Hawes, 18 Salop Street, Bridgnorth, Shropshire WV16 4QU  
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#### Chief Librarian/Micromart Organiser

Tom Heeps, 19 The Crescent, Rauceby Hospital, Sleaford, Lincs NG34 8PR  
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### MAGAZINE SUB-EDITORS

#### Z80 Assembly language (all machines)

Peter Tuffs, 48 Mackie Drive, Guisborough, Cleveland TS14 6DJ  
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#### Newcomers Section (Andrew Ferguson, see above)

#### MZ-80K Section (Maurice Hawes, see above)

#### MZ-80A Section

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Telephone 0733 238358

#### MZ-80B Section

John Ibberson, 38 Elliott Drive, Inkersall, Chesterfield S43 3DP  
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. Up-to-date information on the two Software Manuals appears on page 3 of this issue; for details of back issues see Vol. 7/1 p.3.

As a result of recent purchases of second-hand systems, Maurice also has odd spare copies of many old SHARPSOFT USER NOTES and SHARPSOFT MZ-700 USER NOTES. Write or ring him if interested.

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COMPONENTS AND EQUIPMENT FOR SALE/EXCHANGE

Most of us who dabble in hardware modifications are aware of Maplin and Radiospares. Another name to note is Greenweld Electronic Components, 443 Millbrook Road, Southampton SO1 0HX.

The latest edition of the Greenweld catalogue (normally 70p) was given free with the November 1987 issue of "Everday Electronics". It contains masses of components, leads, connectors, and surplus populated boards with expensive chips on them. Especially useful for MZ-80K owners, a 50-pin female connector with 2m. of ribbon cable (Part No.Z663, £3-50), or with twisted-pair cable (Z664, £3-00). Also the corresponding 50-pin male board-mounting connector with angled pins and ejecting lugs (J043, £2-00). The female 50-way connector is available on its own (J022, £1.61), optional cable retaining clip (J033, 12p). Also, some very cheap C15 tapes in bulk (Enterprise demo tapes) at £1 for 4, or £18 for 100. We have used these tapes and find them very satisfactory. All the foregoing prices include VAT but not carriage.

Cheap Printers

The Morgan Computer Co. (64-72 New Oxford St., London WC1) are advertising Copal SC1000 printers (PCW, Nov. 1987 p.76), for £99 plus VAT. The SC1000 is standard Centronics/Epson, quite fast (100 cps); and has friction and tractor feed.

Secondhand Computers for Sale/Exchange

- 1) W.L.Reid, 37 Arundel Road, Camberley, Surrey GU15 1DL  
Tel (0276) 28291, has a virtually unused MZ-80K for sale, and is looking for around £50-£60.
- 2) D. Lester, Pine Cottage, The Chase, St. Margarets at Cliff  
Dover CT15 6HB, Tel (0304) 852453, has an MZ-80B for sale, with twin floppy discs, a P6 printer, and masses of software including CP/M, MBasic, Scratchpad, and Cardbox, as well as various Sharp programmes. He is looking for £450.
- 3) B.M. McPherson, 31 Prunier Drive, Peterhead, Aberdeenshire, AB4 6ZF Tel. (0779) 76557, has an MZ-811 for sale, with Expansion Unit MZ-1U06, Twin Floppy Discs MZ-1F02, MZ-80BP5 printer, and colour Monitor MZ-1D19, plus Sharp PCP/M and some PDSIG software, together with all necessary cables, interfaces and literature. Brian is looking for £450.
- 4) E. Stanley, 35 Cavendish Avenue, New Malden, Surrey KT3 6QH  
has an Amstrad 464 with tape recorder, green screen Monitor, Rediffusion Teletuner, and Microtext Teletext adaptor, all for sale at around £175, or would consider accepting MZ-700 QUICKDISC unit/interface in part exchange.
- 5) Peter Tuffs, (address in Club News pages) is looking for a printer card and printer for his MZ-80K I/O box.
- 6) Two more MZ-80B's for sale, for details see MZ-80B Editorial.

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## TRANSFERRING PROGRAMMES BETWEEN SHARP MACHINES

By Maurice Hayes and John Edwards

### 1. TAPE PROGRAMMES

There are a number of converters for transferring tape programmes between the MZ-80K and the MZ-80A or the MZ-80B. Some work in both directions, but some only work in one direction (e.g. the "KLOAD" command in BAS MOD). As far as the MZ-700 is concerned, the tape version of S-BASIC will load and automatically convert MZ-80K tape programmes to MZ-700 format. In general, therefore, it is usually possible to find some way of converting tape programmes from one format to another, although there may be problems which require subsequent editing if extra toolkit commands have been used in the source programme, as these may not be allowed for in the converter.

### 2. DISC PROGRAMMES

The MZ-80K disc format is different from the common disc format used on the MZ-80A, the MZ-80B, and the MZ-700 (K&P System). Therefore it is impossible to use MZ-80K discs on the other machines, and programme transfer must be done via intermediate tape files. Unfortunately, most of the existing tape converters do not handle disc commands, so this method is both tedious and unsatisfactory.

Given their common disc formats, programme transfer between the MZ-80A, the MZ-80B, and the MZ-700 (K&P System) is possible without involving tape files. Furthermore, since the Basic keyword tokens in SA-6S10 are a subset of the tokens in SB-6S10 (see Vol.6 No.1 pp.17-19), no token conversion is necessary between those two Basics. Therefore, as long as upper-case filenames are used, Basic programme discs are interchangeable between the MZ-80A and the MZ-80B, though there will be problems if MZ-80B-specific commands have been used. As far as the MZ-700 is concerned, the K&P version of MZ-700 disc basic will read MZ-80A and MZ-80B discs (again, the latter must have upper-case filenames); it even recognises any MZ-80A and MZ-80B Basic files, and types them as "800" instead of "BTX"; and it contains a built-in converter which operates automatically as soon as a "800" file is loaded. Essentially, therefore, there are no serious problems with the transfer of disc Basic programmes between the MZ-80A and the MZ-80B, or from the MZ-80A/B to the MZ-700 K&P System. However, MZ-700 disc programmes cannot be read by the MZ-80A/B and, as always, there will be problems if non-standard commands have been added.

### 3. SUMMARY OF CURRENT POSITION

In the case of tape machines, Basic file conversion is possible in most cases, and even the different tape format used on the MZ-80B is handled by some converters. In the case of disc machines, it is particularly difficult to convert to and from MZ-80K disc files, but MZ-80A and MZ-80B disc files are compatible, and the MZ-700 K&P disc Basic can read MZ-80A/B disc files. However, any process which involves token conversion will encounter problems with non-standard commands.

## 4. A NEW SOLUTION

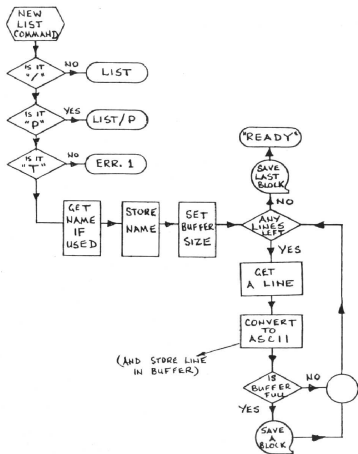
John Edwards has developed an alternative solution, in which transfer takes place using ASCII programme files on tape. There are then no problems with token conversion and disc formats, and the only problem is the different MZ-80B tape format. Initially, John decided to concentrate on MZ-80K and MZ-80A disc Basics, on the basis that any solution would immediately solve the MZ-80K disc problems, and if programmes could be got onto MZ-80A discs (Sharp or CP/M) they could be read by the corresponding MZ-80B disc system and then transferred to MZ-80B tape.

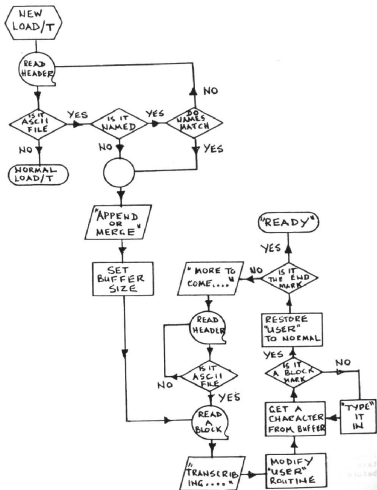
In his new method, John has extended two existing commands, LIST and LOAD/T. In this way, no new keywords are needed and no existing keywords are lost. Meant for occasional use, the new code is placed within the spare area in the relevant interpreter, and therefore it should only be used with an unextended master copy.

LIST/T<"NAME"> (filename optional) creates an ASCII file of the programme listing on tape, with a file type 4 and the usual 16-character filename limit. The routine works out the free space available, sets its buffer limits accordingly (with some margins for safety), and then lists to that buffer and saves it to tape. If the buffer is big enough the save will be done in one block, but if the programme is large (and therefore the buffer is small) the save will be done in multiple blocks.

LOAD/T<"NAME"> (filename optional) is modified to accept type 4 files as well its normal files, and will examine the filetype of the first matching file and load it in the appropriate manner. When a matching file type 4 is encountered, an option is offered to load the file as an "[A]ppend" or as a "[M]erge". The file is then loaded into the buffer and transcribed, line by line, into the Basic text area, as if it had been typed in from the keyboard. If APPEND is chosen, the lines from the ASCII tape file are added onto the end of any existing programme, regardless of line numbers. If MERGE is chosen, the lines from the ASCII tape file will overwrite any identical line numbers in any existing programme. If both of the programmes are very large, there may not be enough free space to perform a [M]erge or [A]ppend. In this case only straightforward conversion is possible; LOAD/T should be preceded by "NEW", and the [A]ppend option should be used, as this allows for the multiple LINE 0 statements sometimes found in commercial programmes.

John has already written and tested his LIST/T and LOAD/T commands for the standard disc Basics on the MZ-80K and the MZ-80A (SP-6015 and SA-6510), and they work like a dream. Any member who wishes to transfer programmes between SP-6015 and SA-6510 can now do so. The two commands are added to the appropriate Basic by a programme called "LIST/T SX-XXXX". Thus, at the moment, there are two versions available, "LIST/T SP-6015" and "LIST/T SA-6510". As some direct feedback may be useful in these early stages, John will act as his own Librarian for these programmes, for the time being (his address appears in the MZ-80K Library pages of this issue). Eventually it is hoped to have a "LIST/T" programme for every standard Sharp interpreter. For those interested, flow diagrams of the two commands appear on the next two pages.

FLOW DIAGRAM FOR NEW "LIST"

FLOW DIAGRAM FOR NEW \*LOAD/T\*





## Sharp Users Club - General Section - RTTY Programme

The program is written in Z80 assembly language. There is a need for precision timing and if Basic is used then slight program changes unconnected with the RTTY subroutine tend to disturb the timing sufficiently to make reception of the transmitted signals impossible.

The tone frequencies are set by :-

```
SPACE:    LD    DE,310H
           LD    (11A1H),DE

MARK:     LD    DE,2B4H
           LD    (11A1H),DE
```

Addresses 11A1H and 11A2H contain the note frequency. The note octave at 11A0H should be set to 2 by :-

```
LD    A,2
LD    (11A0H),A
```

The sound is switched on by :-

```
CALL  44H
```

This is the subroutine to start sound in the MZ80K monitor. Stop the sound by :-

```
CALL  47H
```

The subroutine RTTY takes the byte in the accumulator and outputs the appropriate audio. There should be an initialisation of the audio by :-

```
CALL  MARK
LD    A,2
LD    (11A0H),A
```

If you consider the combinations provided by five bits, you will quickly conclude that only 32 characters can be represented by five bits. How then may the 26 letters, 10 digits plus a few assorted special characters be represented ?

The answer is to designate a particular pattern of bits to represent a 'code' and whenever the code is sent the data following has a different meaning. In the Baudot code there are two codes, these are 'Figure Shift' and 'Letter Shift' respectively 11011 and 11111. Consider the pattern above (11000), in letter shift it represents an "A" and in figure shift it represents a "--". The Baudot encoding table is shown over leaf.

# Sharp Users Club - General Section - RTTY Programme

Figure shift	Letter shift	Bit pattern	Entry number
-	A	11000	1
?	B	10011	2
:	C	01110	3
ans back	D	10010	4
3	E	10000	5
%	F	10110	6
@	G	01011	7
z	H	00101	8
8	I	01100	9
bell	J	11010	10
(	K	11110	11
)	L	01001	12
.	M	00111	13
,	N	00110	14
9	O	00011	15
0	P	01101	16
1	Q	11101	17
4	R	01010	18
!	S	10100	19
5	T	00001	20
7	U	11100	21
=	V	01111	22
2	W	11001	23
/	X	10111	24
6	Y	10101	25
+	Z	10001	26
carriage	return	00010	27
line	feed	01000	28
word	space	00100	29
letter	shift	11111	30
figure	shift	11011	31
all	blank	00000	32

It should be noted that the last six codes are common to both shifts thus there are 58 character codes in the Baudot five bit scheme. These are "A-Z", "0-9", "+-=()!%&?.,/:" plus two special codes 'Bell' and 'Answer back'.

Using the table the message "AB25" will be sent as :-

```
11111 11000 10011 11011 11001 00001
lets   A    B  figs   2    5
```

The process of sending the correct AFSK tones can be seen to contain an element of conversion and data checking. The conversion can consist of a lookup table in ASCII and another in Baudot, but this can be clumsy. Instead machine code has been used to both check the character and index the table. The table is arranged in letter order. A second table is used to redirect entries in figure shift.

In the lookup table a wordspace is represented by hexadecimal 1B, ie 00011011 ( {000} 11011) and "A" by 1C or 00011100 ( {000} 11100).

Bits are removed from the right using 0 to represent mark and 1 to represent space until five bits have been output. The logic for this is given by the following code :-

```

BITS5: LD      B,5           [ five bits to output
LOOP5: RR      A             [ rotate out next bit
      LD      (TS),A         [ save partial result temporarily
      JR      NC,TWO         [ check if 0 if so put out mark
THREE: CALL    SPACE        [ else put out a space bit
      JR      OUTPUT         [ output bit
TWO:   CALL    MARK          [ output a mark bit
OUTPUT: CALL    DELAY        [ wait 20 msecs
      LD      A,(TS)         [ restore partial result
      DJNZ   LOOP5          [ loop round until 5 bits output

```

This is the essence of an RTTY program. The subroutine "DELAY" merely causes a pause of nearly 20 milliseconds.

The timing may be found by calculation, and works out to be :-

```

DELAY: PUSH    AF
      PUSH    BC
      LD      B,19
L1:    LD      A,140
L2:    DEC     A
      JR      NZ,L2
      DJNZ   L1
      POP     BC
      POP     AF
      RET

```

The only other complication is operation of the shifts. Initialisation should put the program into letter shift. The current shift may be indicated by a flag called "SHIFT" which will be 0 when in letters and 1 when in figures.

Any decoding of the original ASCII will need to identify whether the appropriate shift is in operation and if not send it before the character. The letter and figure shifts are entries 27 and 29 respectively in the Baudot table called RTTAB.

Therefore letter shift consists of setting the index to 27, looking up the table and sending the value found THEN sending the appropriate letter. The index is formed as follows :-

```

PRNTS: CP      13      ( ASCII 'cr'
JR      NZ,PRNTSA ( then if not do normal
LD      A,5FH      ( substitute 'cr'
CALL    PRNTSA      ( output it
LD      A,5EH      ( substitute 'lf'
CALL    PRNTSA      ( output it
RET      (

PRNTSA: SUB     20H      ( check if ASCII 00-1FH if so
JR      C,INV      ( then invalid no Baudot equivalent
LD      (CHAR),A    ( save partial result
OR      A          (
JR      Z,PRINT     ( space so output
CP      40H          (
JR      NC,INV      ( greater than 60H so invalid
CP      21H          (
JR      C,FIGS      ( less than 41H("A") therefore figures
LETS:  SUB     20H      ( letters so form index
LD      (CHAR),A    ( save
LD      A,(SHIFT)   (
OR      A          ( check if already in letters if so
JR      Z,PLD       ( jump to output CHAR
XOR     A          (
LD      (SHIFT),A   ( set shift flag to letters
LD      A,27        ( set to index of letter shift
CALL    PRINT       ( and output
PLD:   LD      A,(CHAR) ( output the
CALL    PRINT       ( character stored
RET

FIGS:  CALL    FIGCH ( use CHTAB to swap index and save
LD      A,(SHIFT)   ( check if already in figures
OR      A          ( if so then
JR      NZ,PLD      ( jump to output character
LD      A,1         ( set shift flag
LD      (SHIFT),A   ( to figures
LD      A,29        ( set to index of figure shift
CALL    PRINT       ( and output
JR      PLD         ( output character from CHAR
    
```

The routine to change the table index for figures looks like this :-

```
FIGCH:  PUSH    HL          (
        PUSH    DE          (
        LD      HL,CHTAB    ( start of swap table
        LD      D,0         ( set DE to character
        LD      E,A         ( index
        ADD     HL,DE        ( set HL to new address of new index
        LD      A,(HL)      ( pick it up
        LD      (CHAR),A    ( and save it in CHAR
        POP     DE          (
        POP     HL          (
        RET                    (
```

The final part of the program is the "PRINT" subroutine. This routine looks up the correct code in the Baudot table, adds the start and stop bits and transmits the character in the accumulator.

```
PRINT:  PUSH    AF
        PUSH    BC
        PUSH    DE
        PUSH    HL
        LD      (ST),A      ( save acc for a while
        CALL    SPACE       ( set to space tone
        CALL    DELAY       ( wait 20 millisecs
        LD      A,(ST)      ( restore acc
        LD      HL,RTTAB    ( lookup
        LD      D,0         ( the
        LD      E,A         ( correct
        ADD     HL,DE        ( Baudot
        LD      A,(HL)      ( code
        CALL    BITS5       ( put its 5 bits out
        CALL    MARK        ( revert to mark tone
        CALL    DELAYX      ( 30 millisec delay
        POP     HL
        POP     DE
        POP     BC
        POP     AF
        RET
```

The extended delay is "DELAYX" below :-

```
DELAYX:  PUSH    AF
        PUSH    BC
        LD      B,19
R1:      LD      A,70
R2:      DEC     A
        JR      NZ,R2
        DJNZ   R1
        CALL    DELAY
        POP     BC
        POP     AF
        RET
```

# Sharp Users Club - General Section - RTTY Programme

There now remain a few loose ends to tie up these are the tables and storage areas :-

## Baudot table

```
RTTAB: DB      1EH,1CH,06H,11H,16H,1EH,12H,05H [ ABCDEFG
DB      0EH,19H,14H,10H,0DH,03H,13H,07H [ HIJKLMNO
DB      09H,0BH,15H,1AH,0FH,18H,01H,0CH [ PQRSTUVWXYZ
DB      02H,0AH,0EH,00H,00H,04H,1DH,17H [ XYZ
```

## Figure shift "index" table

```
CHTAB: DB      0,19,19,0,8,6,0,19,11,12,7,26,14
DB      1,13,24,16,17,23,5,18,20,25,21,9
DB      15,3,2,0,22,0,2
```

## Data areas

```
SHIFT: DB      0
CHAR:   DB      0
IS:     DB      0
ST:     DB      0
```

A sample control routine may load the address of the start of the string to transmit into BC and then call the RTTY routine for each character in the string ending when the 'cr' is found.

Eg.

```
SEND:  LD      BC,STRING [ head of string
SENDL: LD      A,(BC) [ pick up next byte
CALL   PRNBS [ output
INC    BC [ next byte
CP     13 [ 'cr' if so
RET    Z [ back
JR     SENDL [ loop
```

It should be noted to avoid confusion that "RTTAB" and "CHTAB" are arranged to suit ASCII decoding and are not copies of the Baudot table.

For example ASCII 5EH and 5FH respectively are assigned by these tables to put out line feed and carriage return respectively.

Substitutions for other ASCII characters have been made, "?" substitutes for ";".

The transmission speed may be increased to 91 baud by changing L1: in DELAY to L1: LD A,70 and changing R1: in DELAYX to R1: LD A,35.

The MZ80K can be made to 'talk' to another computer either by radio transmission or wire. In any case a terminal unit will be required, a suitable unit is the ST5C (PCB supplied by British Amateur Radio Teleprinter Group (BARTG)) which converts the audio tones to either TTL or RS232 logic levels, in the latter case they can be fed directly into an RS232 interface of a micro computer or mainframe.

The following program is loaded at 8000H and it consists of a routine to pick up ASCII data from "FILE" onwards until a OFFH is found, print it to the screen and generate the appropriate tones. The routine uses the subroutines detailed in the text.

Several M280K monitor routines have been used, these are not discussed here but have been fully described elsewhere.

Sample program.

	8000 3E02	LD A,2	) set the octave
	8002 32A011	LD (11A0H),A	) for the tones
	8005 CDmmmm	CALL MARK	) start the carrier
	8008 2160EA	LD HL,60000	) . wait
	800B 2B	DK: DEC HL	) . a while
	800C 7C	LD A,H	) . then send
	800D B5	OR L	) . LETS 'cr' 'cr'
	800E 20FB	JR NZ,DK	) . to allow receiver
	8010 3E1B	LD A,27	) . to be ready
	8012 CDpppp	CALL PRINT	) . and in the correct
	8015 3E0D	LD A,13	) . shift
	8017 CDssss	CALL PRNTH	) .
	801A 3E0D	LD A,13	) .
	801C CDssss	CALL PRNTH	) .
	801F 11ffff	SEND: LD DE,FILE	) start address of file
	8022 1A	SENDL: LD A,(DE)	) next byte of file
	8023 FEFF	CP OFFH	) .
SS	8025 CAeeee	JP Z,FINISH	) . jump to end routine
	8028 F5	PUSH AF	)
	8029 CD1200	CALL 12H	) print on screen
	802C F1	POP AF	)
	802D FE60	CP 60H	) *
	802F 3811	JR C,SEDA	) * convert Sharp lower
	8031 CDB90B	CALL 0BB9H	) * case text to
	8034 FE80	CP 80H	) * ASCII upper case
	8036 3004	JR NC,SENDB	) * only A-Z, 0-9
	8038 3E20	SENDL: LD A,' '	) * and a few special
	803A 1806	JR SENDA	) * characters can be
	803C FE9B	SENDB: CP 9BH	) * sent therefore convert
	803E 30F8	JR NC,SENDC	) * rest to spaces
	8040 D640	SUB 40H	) *
	8042 F5	SEDA: PUSH AF	)
	8043 C5	PUSH BC	)
	8044 D5	PUSH DE	)
	8045 E5	PUSH HL	)
	8046 CDpppp	CALL PRNTH	) output character
	8049 E1	POP HL	)
	804A D1	POP DE	)
	804B C1	POP BC	)
	804C F1	POP AF	)
	804D 13	INC DE	) increment and loop
	804E 18D2	JR SENDL	)

SS Alternatively, RET ZERO here will make the above program into a machine-code sub-routine. ++++++

"CLUB SUPERTAPE 2" ON THE MZ-80B

By Maurice Hawes

*The conversion of "CLUB SUPERTAPE 2" for the MZ-80B revealed a lot about the MZ-80B, but it also proved that CP/M can be used to transfer MZ-80K/A/700 object files to MZ-80B format, and therefore represents a development of general interest.*

CLUB SUPERTAPE 2 is one of the most useful programmes in the Club Library and runs on the MZ-80K/A/700 because they have similar Monitors and use the same tape format; until now it has not been available on the MZ-80B, which has a completely different Monitor and uses a different tape format. The programme therefore needed rewriting so that the Monitor calls suited the MZ-80B, and then had to be recorded in MZ-80B tape format.

The first step was to obtain a Z80 Assembly-Language hard-copy listing and a tape source file of "CLUB SUPERTAPE 2". I did these on my MZ-80K, using my own version of Disassembler BA00. I then worked on the listing, referring to the MZ-80B Monitor Handbook, and changed most of the Monitor calls to suit the MZ-80B. But one crucial call was a problem; there is no MZ-80B equivalent to the MZ-80K/A/700 routine called "GETKEY" at 09B3H, which waits for a keypress with a flashing cursor and returns with the display code in A. I therefore had to write a new routine to do this. I also had to relocate the file so that it started at 1300H, because 1200H does not suit the MZ-80B.

For convenience, ZEN DOS on the MZ-80K was then used to modify the source file and save it on disc, and to make an object file loading at 1300H, in MZ-80K tape format. The big problem now was to get this file into MZ-80B tape format. I solved it by using CP/M on the MZ-80A and the MZ-80B, for which the disc formats are identical. I first copied the MZ-80K tape object file onto an MZ-80A CP/M disc using the "CMT" command. I then used "PIP" to get this file onto an MZ-80B CP/M disc in the second MZ-80A disc drive. Finally I transferred this disc to my single-drive MZ-80B and used "CMT" to create an MZ-80B tape object file.

Needless to say, the programme did not run at the first attempt. I discovered that many of the MZ-80B Monitor routines corrupt registers, where their counterparts on the other machines do not. I also discovered that, owing to the bank-switched video RAM on the MZ-80B, you cannot write to the screen with a simple LD(HL),A. I therefore had to return to the original MZ-80K source file, make the necessary corrections, and repeat the CP/M procedure described above, to create a revised MZ-80B tape object file.

The resulting programme, which I called "CLUB SUPERTAPE 2B", requires that the MZ-80B Monitor should first be loaded into the machine; this is quickly done off disc, but off tape the process is tedious. I therefore created an alternative version for tape-only users; called "CLUB SUPERTAPE 2BM", it contains a copy of the MZ-80B Monitor, and loads and executes from IPL in one go. Both programmes are now in the 'B' library; they both warm start at 1322H and use the 'B' auto-tape controls, but otherwise work the same as "CLUB SUPERTAPE 2" (see Vol.2 No.3 p.33). \*\*\*



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One aim of this section is to point our newcomers to useful information in earlier magazines. That will certainly be a feature of the following pages.

#### FOR-NEXT....STEP 0 LOOPS

In Vol.5/2 p.20 Greg Chapman showed how WHILE/WEND and REPEAT/UNTIL can be duplicated in Sharp Basic. In Vol.5/3 p.26 I pointed out the advantages of an alternative coding, namely using FOR-NEXT.... STEP 0 LOOPS. Shortly after this I heard from John Hooper, who is "The Sharp Open File Assessor" for 'Practical Computing' (see Vol.4/4 p.27). The original idea of FOR-NEXT ....STEP 0 LOOPS came from John. His idea was published in the Sept. 83 edition of 'Practical Computing'.

John was kind enough to send me photocopies of the published material covering the development of the idea. It appears that there are some slightly different ideas on closing the LOOP, but they lose in clarity what they gain in brevity. A further point of interest is that the structure of Basic used with the Sinclair 48K Spectrum, and also the 'New Brain' is such that FOR-NEXT LOOPS do not improve the speed. Geoff Childs made the point to me that the concept would not be useful for the MZ-700 either, as the first thing its interpreter does is to convert all GOTOs and GOSUBs to absolute addresses.

#### Extended INPUT routine for the MZ-BOB

In Vol.3/3 p.67 there was an INPUT routine for the MZ-BOB. That routine is enhanced, compared to the one we looked at in Vol.7/1 (p.11), in so far as it allows the type of INPUT (numeric or alpha-numeric) to be specified in the main program, e.g. <TYPE\$=NU\$>, prior to calling the subroutine; also the length of INPUT is similarly specified, e.g. <MAX=B>; the subroutine then automatically shows the appropriate number of dashes below the INPUT position. Larry Galliford (our last Secretary) told me that he used this routine for a long time, finding it entirely satisfactory. So there is a tip for new MZ-BOB owners.

#### Xtal 3.1 extended INPUT routine

A fairly similar routine, WRITTEN in Xtal 3, was published in Vol.5/3 p.31, but it was rather limited in scope being designed so that all INPUTS should be made at one point on the screen. Let's look at another Xtal 3 version which not only mimics the original MZ-BOB routine, but improves it by accepting a single character INPUT without requiring CR to be pressed; other improvements are that it allows for 'cursor back' to operate as 'delete' (just as in the normal Xtal INPUT command), and it ensures that pressing CR returns the computer to upper case mode.

Here then is the subroutine in its Xtal version.

LISTING for Xtal 3.1 extended INPUT routine

```

1000 REM The actual subroutine starts at 8000; the prior LINES are examples of
using the subroutine.
1010 CH$="Alpha-numeric"; NU$="Numeric only;"
1999 REM *****
2000 TYPE$=NU$: MAX=7: PRINT@0,0,"Personal tax allowance?.....("); GOSUB 8000:
IF VAL(ANS)<2205 THEN 2000: REM* Last statement is example validation procedure.
2010 PRINT: PRINT: PRINT"O.K. Allowance="(ANS: END: REM **The LINES up to here
represent the entire main program.
7999 REM *****
8000 REM***** Xtal 3.1K. Length and type limited INPUT routine; accepts
single character without need to press CR; reverts to upper case automatically.
PRINT$ appropriate length of dashes below the required INPUT position.
8010 AN$="": X9=POS(1): Y9=POS(2): PRINT@X9,Y9+1,MUL$("-",MAX); GOSUB 8020: GOTO
8022
8020 PRINT@X9,Y9,MUL$( " ",MAX); MUL$(CHR$(8),MAX); RETURN: REM* 1 LINE GOSUB to
clear away erroneous entries (can also be used independently from main program)
8022 FOR I9=1 TO MAX+1
8024 K9=INCH: IF K9=127 AND I9<>1 OR K9=8 AND I9<>1 THEN PRINT CHR$(8) " CHR$(8)
; I9=I9-1: AN$=LEFT$(AN$,LEN(AN$)-1); GOTO 8024: REM Delete and cursor back.
8026 IF K9=13 THEN I9=MAX+1: GOTO 8038: REM 13<CR>.
8028 IF TYPE$=CH$ THEN IF K9>31 AND K9<123 THEN 8034
8030 IF TYPE$=NU$ THEN IF K9>44 AND K9<58 THEN 8034
8032 MUSIC"-C3": GOTO 8024
8034 IF I9=MAX+1 THEN MUSIC"-C3": GOTO 8024: ELSE IF MAX=1 THEN I9=MAX+1
8036 PRINT CHR$(K9): AN$=AN$+CHR$(K9)
8038 NEXT I9: IF AN$="" THEN 8022
8040 POKE 4464,0 : POKE 57347,05: REM * Upper case and LED light to green.
8042 RETURN

```

Within the subroutine itself *unusual* VARIABLE names have been used, I9, K9, X9, Y9; this is to allow a better choice of VARIABLE names in the main program. The VARIABLES used are listed below, but to save space the additional VARIABLES used in the following 5060 routine are included (they are slightly inset).

```

AN$  The ANswer returned from the subroutine.
CH$  Holds a STRING and is used to set TYPE$ for alpha-numeric.
I9   LOOP counter.
K9   Holds the ASCII value of the character TYPED.
    K9$ (5060) Holds the character TYPED.
MAX  Set in the main program to limit the number of characters.
    allowed. 5060 only recognizes MA.
NU$  Holds a STRING and is used to set TYPE$ for numeric.
    R9 (5060) Holds the contents of 10407 to reset GET.
TYPE$ A marker set either to AN$ or CH$ to control INPUT. 5060
    only recognizes TY.
X9   Holds the lateral cursor position.
Y9   Holds the vertical cursor position.

```

Note the <POKE 57347,5> in LINE 8040 to set the LED light to green. This is correct for Xtal and 5060, though the command is not required in the 5060 subroutine as this interpreter is designed to return to upper case mode when CR is pressed. The routine in Vol.5/3 p.31 showed (in the final LINE) a <POKE 57346,205>; this seems to work, but Geoffrey Childs has kindly clarified the situation for me: 57347,5 is correct.

SP-5060 (not 5060.A1) extended INPUT routine

The main reason that this subroutine cannot easily be WRITTEN for 5025, or even 5025.K2, is that it uses the STRING\$ function (MUL\$ in Xtal 3).

In the program fragments shown below, together with the subroutine, an additional 'main program' example has been given, starting at LINE 3000. Though this happens to be picking up alpha-numeric characters the really significant point is that it shows how the subroutine can be used when the prompt ("New password" in this case) appears on the screen at an indeterminate point, i.e. there is no immediately prior CURSOR statement to define its position. LINE 3005 shows the procedure in use; that is it calls GOSUB 8020, which clears the erroneous INPUT, and restores the initial cursor position. The Xtal 3 subroutine allows the same procedure to be used if necessary.

8014,8026,8038 Most of the significant points about using POKE 10407,0 and USR(2483) for a flashing cursor were covered in Vol.7/1 p.12. However note that if the SHIFT/BREAK key could be used during the INPUT routine then the value in ADDRESS 10407 might not be returned to its original value; this could produce some odd results on resuming use of the program. Maurice Hawes gave us all the necessary information about making Sharp programs unBREAKable in Vol.5/2 p.22; since INPUT is not used in the subroutine, and SHIFT/BREAK cannot clash with the <MUSIC> in the subroutine, only the POKE appropriate to excluding BREAK in the EXECUTE LOOP is required, namely POKE 6633,195.

8030 This LINE deals with the 'delete' and 'cursor back' keys. Sharp Basic does not have the <AND> or <OR> functions as such, and <\*> and <+> must be used instead. Note that <+> has a lower precedence than <\*>, just as <OR> has a lower precedence than <AND> (see p.11 Xtal manual), so the <\*>s are resolved before the <+>, and there is no need to bracket the clauses surrounding the <\*> together.

8032 This LINE is necessary to prevent a character being PRINTED; this is required as in Sharp Basic 'delete' awkwardly falls within the range of the full character set A-Z.

8036 Unshifted 'SML/CAP' to toggle upper/lower case.

8072 The obvious thing to use in this LINE was <PRINT " "> to PRINT a space: however it may be worth making the point to newcomers that SP-5060VM will not PRINT a space with <PRINT CHR\$(32)>; a peculiarity which SP-5060VME corrects. Note too, by the way, that even more usefully the VME version of 5060 will PRINT CHR\$(34) and CHR\$(44), namely quotes and comma.

The rest of the subroutine is sufficiently well REMmed to not require further comment, but for those comparing this with the original MZ-80B version it may be of interest to know why the LOOP has here been set to terminate at 'MAX+1' rather than incrementing the value of MAX prior to entering the LOOP; this was done to facilitate the addition of the possibility of using GOSUB 8020 independently, as already described. I'd like to thank Greg Chapman for testing this routine with 5060.A1, and letting me know that there's not a chance of it working on the MZ-80A!

LISTING for SP-5060 extended INPUT routine

```

1000 REM The actual subroutine starts at 8000; the prior LINES are
1001 REM examples of using the subroutine.
1010 CH$="Alpha-numeric"; NU$="Numeric only"; REM Initialisation.
1999 REM *****
2000 TYPE$=NU$; MAX=7; CURSOR0,8; PRINT "Personal tax allowance?.....£";
2005 GOSUB 8000; IF VAL(AN$)<2205 THEN 2000; REM * Last statement is an
2006 REM illustrative validation procedure.
2010 PRINT: PRINT "SO.K. Allowance=£"; AN$
2999 REM *****
3000 TYPE$=CH$; MAX=8; PRINT "New password? (*;CH$;)*";
3005 GOSUB 8000; IF AN$="FRED" THEN GOSUB 8020; GOTO 3005
3006 REM Previous LINE contains illustrative validation procedure.
3010 PRINT: PRINT "SO.K. Password now "; AN$; END
3015 REM * The LINES up to here represent the entire main program.
7999 REM *****
8000 REM* SP-5060, MZ-80K. Length and type limited INPUT routine; accepts
8001 REM single character without need to press CR. PRINTS appropriate length
8002 REM of dashes below the required INPUT position.
8003 REM Introduces a flashing cursor.
8014 AN$="": POKE 4633,195; R9=PEEK(10407); POKE 10407,0; REM Repeat BET.
8016 X9=PEEK(4465); Y9=PEEK(4466); REM Cursor position.
8018 CURSOR X9,Y9+1; PRINT STRING$(MAX,"-"); GOSUB 8020; GOTO 8024
8020 CURSOR X9,Y9; PRINT STRING$(MAX," "); STRING$(MAX,CHR$(20));
8022 RETURN: REM * This 2 LINE GOSUB clears away erroneous entries.
8024 FOR I9=1 TO MAX+1
8026 USR(2483); REM Flash cursor; GET K9$; IF K9$="" THEN 8026
8028 K9=ASC(K9$)
8030 IF (K9=96)+(I9<>1) + (K9=20)+(I9<>1) THEN GOSUB 8070; GOTO 8026
8032 IF K9=96 THEN 8044
8034 IF K9=99 THEN POKE 4464,1; POKE 57347,4; REM Lower case; GOTO 8026
8036 IF K9=98 THEN POKE 4464,(1-(PEEK(4464))); POKE 57347,(5-PEEK(4464)); GOTO 8026
8038 IF K9=102 THEN I9=MAX+1; POKE 10407,R9; POKE 4633,202; GOTO 8052
8040 IF TYPE$=CH$ THEN IF (K9>31) * (K9<190) THEN 8046; REM All lower case.
8042 IF TYPE$=NU$ THEN IF (K9>44) * (K9<58) THEN 8046
8044 MUSIC="C3"; GOTO 8026
8046 IF I9=MAX+1 THEN MUSIC="C3"; GOTO 8026
8048 IF MAX=1 THEN I9=MAX+1
8050 PRINT K9$; AN$=AN$+K9$
8052 NEXT I9; IF AN$="" THEN 8024
8054 RETURN
8069 REM
8070 REM* GOSUB for 8030
8072 PRINT CHR$(20); " "; CHR$(20); I9=I9-1; AN$=LEFT$(AN$,LEN(AN$)-1)
8074 RETURN

```

Using Seetex for multiple copies

Seetex is arguably the best word processor for an Epson/MZ-80K combination. One problem is in printing multiple copies: apart from the nuisance of switching the printer off line for a form feed, Seetex often prints a spurious character when the printer is switched off line. I find that terminating the text with 'Form-feed, clear the print buffer, set line feed to zero' (all available as per Vol.5/1 p.37) is the best way of setting the printer ready for the next copy. \*\*

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**MZ80K News**

Very welcome contributions this time from two new faces, Jac van Schoor in South Africa, and Eric Stanley. Also a useful reprint from an old issue which is no longer obtainable; and at last, thanks to John Edwards (again!), you can get your MZ-80K disc programmes on to other machines. Thanks also to Alan Bunting for his continued sterling work on the MZ-80K Disc Library, and to Mark Cox for his programmes.

\*\*\*\*\*

## NEW CHARACTER EPROMS FOR THE MZ-80K and P3 PRINTER

By Jac van Schoor

I still use an MZ-80K/P3 set-up for business purposes. The original small letters on the P3 leave a lot to be desired; and in Basic it is impossible to use the comma in a string input, as it will be interpreted as a delimiter. For the same reason, it is impossible to print the double quotes character, except by special programming. I also find that the only graphics characters I use are the single-width straight-line ones, and I lack a 1-dot character for light horizontal lines (the "full stop" is 4-dot), and a thin vertical dotted line.

I have therefore blown two special character EPROMs, one for the P3 printer and the other for the MZ-80K, which together overcome all these problems. The lower-case letters are redrawn so that g, p, q, j, and y have descenders, and certain graphics characters, and thus their keys, are redefined as shown below. In addition to providing the additional graphics characters [.] and [;:], this arrangement makes it possible to include [,] and ['] anywhere in a string, as inert graphics characters. The diagram below shows which graphics keys are used; they are the same in Normal, Shift, and SML keyboard modes:-

				"
		.	:	'

MZ-80K

GRAPHICS

KEYPAD

All the other graphics keys produce their normal characters on the screen, but of these, only single-width straight-line graphics are reproduced by the printer; any other graphics sent to the printer are converted to a full block (ASCII 255). A printer test run is reproduced on the next page to illustrate the changes.



# Sharp Users Club - MZ80K Section - BOX listing

CEEA	XOR A	AF	;patch executes here
CEEB	LD (1A5F),A	325F1A	;put address of BOX
CEEE	LD A,8CFH	3ECF	;into keyword table
CEFB	LD (1A68),A	32681A	
CEF3	LD A,4FH	3E4F	;and change keyword
CEF5	LD (L23E),A	323E42	;BYE
CEFB	LD A,8DBH	3ED8	;to
CEFA	LD (L23F),A	323F42	;BOX
CEFD	JP 1274	C37412	;back to Basic warm start
CF00	CALL 19A9	CDA919	;start of BOX routine
CF03	LD A,E	78	;get 1st parameter
CF04	CP 81H	FE01	
CF06	JP M,139B	FA9B13	;error if less than 1
CF09	CP 27H	FE27	
CF0B	JP P,139B	F29B13	;or greater than 39
CF0E	PUSH AF	F5	
CF0F	CALL 169A	CD9A16	;look for
CF12	INC L	2C	;comma (else error)
CF13	CALL 19A9	CDA919	;get 2nd parameter
CF16	LD A,E	78	
CF17	CP 81H	FE01	
CF19	JP M,139B	FA9B13	;error if less than 1
CF1C	CP 17H	FE17	
CF1E	JP P,139B	F29B13	;or greater than 23
CF21	EX AF,AF	0B	;get parameters into
CF22	POP AF	F1	;AF
CF23	EX AF,AF	0B	;and AF'
CF24	PUSH HL	E5	;start drawing box
CF25	CALL HFB1	CDB10F	
CF28	PUSH HL	E5	
CF29	CALL HDA6	CDA68D	
CF2C	LD (HL),5CH	365C	;draw top L.H. corner
CF2E	CALL TF62	CD62CF	;draw top edge
CF31	CALL HDA6	CDA68D	
CF34	LD (HL),5DH	365D	;draw top R.H. corner
CF36	EX AF,AF	0B	;get vertical parameter
CF37	LD C,2BH	0E2B	;start drawing sides
CF39	LD B,0BH	060B	
CF3B	PUSH HL	E5	
CF3C	POP IX	DDE1	
CF3E	POP HL	E1	
CF3F	TF3F:ADD HL,BC	09	
CF40	ADD IX,BC	DD89	
CF42	CALL HDA6	CDA68D	
CF45	LD (HL),79H	3679	
CF47	LD (IX+00H),79H	DD360079	
CF4B	DEC A	3D	
CF4C	CP 80H	FE00	
CF4E	JR NZ,TF3F	28EF	
CF58	ADD HL,BC	09	
CF51	CALL HDA6	CDA68D	
CF54	LD (HL),1CH	361C	
CF56	CALL TF62	CD62CF	
CF59	CALL HDA6	CDA68D	
CF5C	LD (HL),1DH	361D	
CF5E	POP HL	E1	
CF5F	JP 19B5	C30519	;finished, back to Basic programme

Sub-routine  
to draw horizontals

CF62	INC HL	23
CF63	EX AF,AF	0B
CF64	LD C,A	4F
CF65	LD B,0BH	060B
CF67	LD D,H	54
CF68	LD E,L	5D
CF69	INC DE	13
CF6A	CALL HDA6	CDA68D
CF6D	LD (HL),7BH	367B
CF6F	LDIR	EDBB
CF71	RET	C9

+++++

*MZ-80K Disc Basic SP-7011 was discussed by David Jackson in Vol.3 No.1, now out of print. Many recent members have disc drives, so we are reprinting the article for their benefit.*

SOFT-BASIC ON DISK by David Jackson

I get the impression that the French have a different character generator to give accented letters from some of the odd text. Soft-Basic seems to have travelled quite widely; buried in the depths is a message to say that it was written by a commercial software-house in France! The version number seems to have been changed en route, since in one place it calls itself 7015 (which clashes with FDOS) and in the location used by 6015 to announce itself, 7011 appears. 7011 is not seen on the screen because the cold start routine picks up the CR before the title instead of the title itself. Nevertheless I propose that it should be called 7011 so that we all know what we are discussing.

The peek-protect flag has been moved to 100B1 (2761H), but I have yet to unblock LIST/H below 6000H, which is inhibited. TRACE covers the screen in numbers like 5060; Commander's neat, variable speed version is much better. One very good feature is that BREAK now interrupts a directory listing, the lack of which was most irritating at times in 6015. The other programs on the disc are of mixed quality. The first gives instructions in French, which have been badly developed from the 5060 instructions, but the fundamentals are mostly correct. Standard Club instructions for 5060 will suffice with the addition of:-

LIST/H is inhibited below 6000H.

LOAD+ requires the second program to be on disc, not cassette. This command will not work if the highest line number in the first program is larger than the lowest line in the second program. From my experiments a gap of at least 10 seems to be necessary.

AUTO is identical to 5060. AUTO alone starts numbering from 10, but only works if line 10 does not exist already. Empty lines are not accepted by AUTO, so just CR will not give vacant lines.

RENUM does not report errors during renumbering, so must be used with care. But unlike Commander it does renumber RESTORE, which is a great improvement.

FUNCTION KEYS work as usual, but refining the keys is very easy. By booting with "FDA" instead of "FD" a key-defining routine precedes the entry into BASIC. Despite the French, which I am part way through replacing with English, it is very easy to follow. The only pitfall to avoid is with RUN, which needs to have a leading space to avoid problems with locked files. After the keys have been set up there is a choice of recording the the changed key list or not, but this is not prompted from the screen. To record the new version for future use on normal boot-up enter a colon instead of "O" (French for "Y") when prompted to agree that the keylist is satisfactory. PRINTER DRIVERS - I use an Epson FT111 and was please to find that my 6015 patch still worked with 7011.

OVERALL - 7011 is a great improvement over 6015 and I would recommend any disk user to ask for a copy. \*\*\*



*David Jackson's article, dated March 1983 and reprinted opposite, deals with the first Club version of SP-7011. Other versions appeared in 1983-4, including an English version emanating from Yeovil. More recently, our very own John Edwards has added extra features. This survey brings you up-to-date with the current situation.*

The original Club disc of SP-7011, discussed in David Jackson's article, boots with a display giving a French address and the title "SOFT-BASIC". It responds to the "FDA" boot command with the keylist option, and has the LIST/H command inhibited below 6000H. The interpreter contains a standard Sharp printer routine which can be modified to run an Epson printer with the normal SP-6015 Epson machine-code patch. The disc also carries a Basic instruction manual programme, called "Com. SOFT-BASIC", which is in French and can only be gone through in the order it is written, by repeatedly using the CR key. Another programme on the disc, "Com.SOFT-BASIC/P", produces a hard copy of the French manual.

A second version of the French SP-7011 disc is in circulation, with an Epson printer routine. This disc appears to be similar to the one discussed above, and was presumably obtained from a French original simply by adding an Epson printer patch. As a matter of interest, the printer routine will drive a Sharp printer correctly if the 3 locations 3DFD-3DFFH are poked with 0's.

The first English version of SP-7011 boots with a display giving the Yeovil College address and the title "BASIC 7011". This disc does not recognise the special "FDA" boot command. The LIST/H command has been de-inhibited to work below 6000H, and the printer routine is standard Sharp. The accompanying Basic instruction manual programme reveals that the programmes are the work of David Jackson, for the Sharp Users Club in Yeovil. The instruction manual is a great improvement on the original French version because it provides a menu from which you can select any page of the manual at will, more than once if required. There is no special programme to produce hard copy, but given the BREAK/4 command in SP-7011, such a programme is hardly necessary.

Very recently, John Edwards has done some very useful work on the English version of SP-7011, and has added an "AUTO RUN" feature (see Vol.7 No.2 pp.26-27), and a "PRINT @" command (see Vol.7 No.2 p.30). The "AUTO RUN" feature is particularly useful if you wish to poke changes into the interpreter at boot-up, or automatically set up your printer in some special way. The "PRINT @" command is very useful if you are trying to run programmes which have previously been written under some other SP-XXXX Basic, with this command incorporated. It is hoped that this disc, with an optional EPSON printer patch programme added, will eventually become the standard Club version of SP-7011. For the moment, however, those who wish to use an Epson printer will have to use the French disc with an Epson printer routine. In any case, all the SP-7011 master discs in the Library now contain David Jackson's English instruction manual programme. The instructions are in fact almost identical to those for the tape version of the interpreter, SP-5060, see Vol.2 No.1 (April 1982) pp.3-4, or Software Manual I pp.6-10. \*\*\*\*\*

## MZ-80K DISK FORMATS

By Peter Tuffs

I recently bought, at modest cost, a standard MZ-80K set-up with I/O box and twin FD drives. In the course of converting my own macro-assembler to work with disk drives, I learned a little about the format of standard Sharp disks on the MZ-80K; much of what I learned was given by Geoff Jones in his article "DISC-OVERING DISC DRIVES" (Vol.5 No.3 pp.36-39), but I did find one or two other pieces of information as well. I have therefore summarised all my findings below, referring to Geoff's article as necessary.

## STANDARD MZ-80K DISKS

A standard MZ-80K disk (SKD) has 70 concentric circular tracks (numbered 0-69) and each track is divided into 16 sectors (numbered 1-16). Each sector holds 128 bytes, so the total capacity is 70 tracks/1120 sectors/143,360 bytes. In practice these are not all available to the user, because every disk has track 00 reserved for a bootstrap program and a file allocation table (FAT), and tracks 01-03 reserved for the directory. In addition, a master disk has tracks 4-13 reserved for disk Basic. Therefore an empty slave disk has only 1056 sectors free, and an "empty" master disk has only 896 sectors free.

On a MASTER disc, track 00 sectors 1-14 contain the BOOT programme, which is loaded by the FD ROM on the disk interface card, and looks for the programme starting on track 4. This is normally disk Basic, but can in fact be any machine-code programme. On a SLAVE disc, track 00 sectors 1-14 are filled with 00's and the disk cannot boot.

On ALL discs, track 00 sectors 15-16 contain the FAT. Although 256 bytes are available, only the first 136 are used. The first two bytes are used for the volume number; the next two show the number of sectors currently in use, and this information is used to determine if sufficient space exists on the disk to allocate a file. The remaining 132 bytes contain the actual FAT; two bytes (16 bits) are used for each track. The FAT therefore has a capacity of 66 tracks; this is sufficient because tracks 00-03 do not have to appear in the table. If the FAT is examined in detail it will look something like this:-

```
Track 4 1111 1111 1111 1111 Fully used
track 5 0001 1111 1001 1111 Partially used
```

In other words, zero bits indicate unused sectors. The FAT is searched during file allocation to locate the first free space.

On ALL disks, tracks 01-03 are allocated to the directory. There are therefore 48 sectors, which at two directory entries per sector, gives a capacity of 96 entries. Each directory entry occupies 64 bytes, laid out as described by Geoff Jones on page 37 of Volume 5 No.3.

(continued on next page)

On a MASTER disc, tracks 04-13 are taken up by disk Basic, and the data space starts at track 14, sector 1. Tracks 14-69 (56 tracks/896 sectors/114,688 bytes) are therefore available for data. The directory still has room for 96 entries, because the master file does not appear in the directory.

On a SLAVE disc, tracks 04-69 (66 tracks/1056 sectors/135,168 bytes) are available for data. The directory has room for 96 entries.

The data portion of the disk is used differently, depending upon the file type. This article deals with file types 1 to 4, though it is known that there are other types such as 5, and A0H.

Type 01 (OBJ), 02(BTX) and 03(BSD) files all use the disk in the same way. Each sector contains 126 bytes of data followed by two bytes which show the track and sector of the next sector of data; if the sector is the last one in a file, these two bytes contain 00's.

Type 04 (BRD) files are arranged differently. The directory entry points to a space sector, and the file size in the directory is set to zero. The space sector contains, in bytes 3 to 128, the track addresses of the real data in the order allocated.

When a type 01, 02 or 03 file is deleted, the directory entry is removed and all the others are shuffled up to fill the gap. The relevant data sectors are then flagged in the FAT to show that they are now free. The data sectors themselves are not erased.

When a type 04 file is deleted, the information in the space sector is used to free the relevant sectors in the FAT. The space sector itself is then freed, and the directory entry is removed. The data sectors themselves are not erased.

#### OTHER MZ-80K DISKS

All have the same basic format of 70 tracks x 16 sectors x 128 bytes, and all have a boot track and three directory tracks. But the boot programme is different from that used on an SKD, and the directory tracks are often used differently:-

- a) ZEN DOS - 4 entries per directory sector. Last 3 bytes show number of sectors used by file, start track and start sector. Rest same as SKD.
- b) FDOS - 2 entries per directory sector. Same as SKD except that bytes after execute address and before track/sector contain extra information.
- c) S-DSM - 2 entries per directory sector, as SKD.
- d) Q-DOS - 2 entries per directory sector, as SKD.

There may be other formats used on the MZ-80K, but they have not been included here because I do not have them at present. \*\*\*

*Edited by Andrew Ferguson*

*on behalf of*



**Library News**

*Chief Librarian Tom Heeps.*

As you see the page is titled 'K' Library News. The MZ-80A Library is now entirely separate (see Vol.7/1 p.34), though the MZ-80A Librarians, (Ian Baldwin and Don Cram) are still listed in the accompanying list of Librarians.

### **Librarian changes**

Overleaf is a revised list of our Librarians. Note that Alan Bunting is the Librarian who handles all requests for disc copies.

Changes in the list have been made to include the facts that John Edwards has taken over from Geoff Jones (as reported in Vol.7/2 p.17) to cover Tape 66; Don Cram has a new address, as announced in Vol.7/2, and a correction has been made to the Tapes that he covers: a new Librarian, Leslie Panrucker, has taken over all the Tapes which Tom Heeps used to look after (Tom however continues to hold all the masters): Harold Saunders has relinquished his position as Librarian.

Our thanks are due to Harold Saunders for the work he has done over the years. Recently he has been having problems copying tapes: we apologise to members who have had problems resulting from this and hope that all has now been sorted out. To solve the problems Leslie Avery, who is a Hi-res man, has become a Librarian and takes over Tape 56; Harold's other Tapes, 41-45, are already covered by Geoff Long.

### **Obtaining copies of programs, Club Tapes, and SIBs**

The procedure for obtaining of Tapes was covered in Vol.7/2 p.13, and the procedure for obtaining Software Information Bulletins was covered in Vol.7/1 p.16. Note that the latest published Library List is dated 13th October 1986, and appears in Vol.6/1 pp.24-27.

### **SAVING and LOADING problems**

One of our Librarians, Dudley Jackson, resigned some while ago, somewhat regretfully, on account of the troubles that he was having with LOADING and SAVING. This prompts me to related my experiences with two of my MZ-80Ks. One of them was giving problems until I discovered that the secret was to press the PLAY button down very slowly. Another one also started giving problems: it took longer to discover the technique that worked in this case, which was to press the PLAY button slowly until some movement of the tape was observed, and then to finish with a rapid press. In both cases once the correct technique had been discovered the unreliability problem was virtually solved. \*\*

# Sharp Users Club - MZ-BOK Section - 'K' & 'A' Librarians

## List of 'K' & 'A' Librarians

Librarian	Tape No.
11 Mr T.P.Heeps <sup>1</sup> (Tom - 052 98316 - 7-10 pm 7 days a week)	
19 The Crescent, Rauceby Hospital, Sleaford, Lincs. NG34 8PR	
21 Mr J.Rees (John)	1-5:57:58
The Cottage, Woodside Avenue, New Longton, Preston, Lancs. PR4 4YD	
31 Mrs B.Hodgson (Barbara)	11-15
50 Waterdale, Sutton Park, Hull, Humberside. HU7 6DH	
43 Mr I. Baldwin. (Ian - 0785 55461)	All 'A' tapes
27 Sherwood Avenue, Stafford, ST17 9BX	
53 Mr F.Mardell (Frank)	16-20
77 St.Andrews Rd, Henley on Thames, Oxon. RG9 1PH	
61 Mr C.G.Wright B.Sc (Christopher)	21-23:25
19 Redwood Glen, Chappletown, Sheffield. S30 4EA	
71 Mr D.Cram (Don - 0934 636204 - afternoon & evenings)	26-35, 1A, 2A
Step Aside, 19 St Nicholas Road, Uphill, Weston-S-Mare, BS23 4XE	
81 Mr L.Panrucker (Leslie -0778 425480)	1-10:36-40
41 Westwood Drive, Bourne, Lincs. PE10 9QH	
91 Mr G.R.Long (Geoff. - 0908 679 666 - before midnight!)	41-45
14 Braunston, Moughton Park, Milton Keynes, MK6 3AU	
101 Mr I. Edwards (Ian)	46-50:61-63:65
11 High Meadow, Washingborough, Lincoln. LN4 1BE	
111 Mr A.Newgrosh (Anthony - 061 428 7710)	51-55
5 Delaware Road, Batley, Cheshire. SK8 4PH	
121 Mr L. Avery (Leslie- Torquay (0803) 37146)	56
Garden Close, Greenway Road, St. Marychurch, Torquay. TQ1 4NJ	
131 Mr J. Edwards (John - Codsall (090 74) 5273)	66
Daken Piggeries, Holyhead Road, Codsall, Wolverhampton, W. Mid. WV8 2HX	
141 Mr J.Tremayne (John - 0633 893371)	67-68
Mylor, 12 Forge Lane, Bassaleg, Newport, Gwent.NP1 9NF	
151 Mr A.Ferguson <sup>2</sup> (Andrew - 0491 574850)	24:64:69:75
11 Harcourt Close, Henley-on-Thames, Oxon. RG9 1UZ	
161 Mr A. Bunting (Alan - 0786 75516. Tape 76 req.20+p.p.kp.)	76 & all discs.
28 Peilstreem Avenue, Stirling, FK7 0BE	

\*

### SENIOR LIBRARIAN

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



\*\*\*\*\*  
\* List revised \*  
\* 16th Oct. 1987 \*  
\*\*\*\*\*

In event of complaint please contact Tom Heeps. All programs sent to the Club Library must include adequate documentation.

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### ASSISTANT TO SENIOR LIBRARIAN

Please send reviews for 'K' programs, intended for the SIBs, to Andrew Ferguson. Similar material for the 'A' programs should be sent to Greg Chapman.

MZ-80K DISK LIBRARIAN

Alan Bunting  
28 Pelstream Avenue  
Stirling FK7 8BE  
Tel. 0786-75516 (After 9 p.m. please)

Not quite so much excitement as last issue, but there has been a substantial increase in the library contents. I still find that there is more 'going out' than 'coming in' and, while appreciating that this must inevitably be the case, it seems hard to believe that there aren't more of you out there with something worthwhile offering to the library. At the time of writing there is absolutely nothing 'in stock' for the next issue so contributions would be much appreciated. Anyone wishing an up to date MZ-80K Disk Library list can obtain one by sending 4 first class stamps to the above address. You will find that, although substantial, the library does have a lot of gaps in it which you might be able to fill and thus give pleasure to your fellow-members.

Now down to the news. Mark Cox has been busy again and his latest offering is COX SP-6825a Special Basic. This is a further development of his SP-6825 described in Volume 7 No.2 which now enables long SP-5825 programs with separate data to be stored on and run from disk. Volumes 22, 23 and 24 each contain the new Basic, instructions and one or more long programs. Included is 'As the Crow Flies' one of the finest pieces of programing ever seen for the MZ-80K.

Three more interpreters are now in the Library - Pascal SP-6610; an English version of Basic SP-7811 with Sharp Printer Driver, "AUTO RUN" and "PRINT0"; and Ormas Basic SP-6818. Except for SP-7811, which has an instruction program on the disk, no instructions are available for these interpreters.

No sooner had I persuaded John Edwards to write a single disk drive copy program than, out of the blue, I was sent S-DOM. This rather strange disk contains routines to copy from anything to anything, renaming, showing content of disk in sectors and tracks, memory dumps and, of course, a single disk drive copy program. It's not as fast as John's but it's now in the library for those who are interested. (18p stamp for instructions, please). Incidentally, John has now produced a double-drive version of his copying program which runs under SP-6815 (but none of its variants as I eventually discovered after telling him his single drive program was a failure!) This program has been added to Volume 185.

Two appeals for help - does anyone have the rules for 'WAR' on Volume 18; and is anyone interested in de-bugging a disk of several programs which have been (almost) converted from 5825 to 6815 and, had I had the time (and been clever enough) should have been in the library by now?

Additions and Deletions since Volume 7, Number 2

- VOL. 4 - Dragon Quest; Revenge of the Bairog
- VOL. 22 - (New Volume, includes QDOS 6025a + Guide) Bloodstone Castle + Data
- VOL. 23 - (New Volume, includes QDOS 6025a + Guide) Chessland + Data; Computerist's Quest + Data; The Complex + Data
- VOL. 24 - (New Volume, includes QDOS 6025a + Guide) As the Crow Flies + Data
- VOL.100 - (New Volume) SP-7011 (Sharp printer, AUTO RUN, PRINT@); 7011 Instructions (English); K to A convertor; M-C Program Mover; WDPRO HP225J convertor
- VOL.105 - Drive 1 to Drive 2 Copy (Must be used with SP-6015)
- VOL.106 - (New Volume) Disk Pascal SP-6610 (no instructions)
- VOL.107 - (New Volume) S-DOM Disc Operating System
- VOL.111 - This Volume is no longer available.
- VOL.112 - (New Volume) DRMAS Disk Basic SP-6010 (No instructions)

XXXXXXXXXX

When sending for programs, please include FORMATTED DISKS, address label and return postage.

XXXXXXXXXX

EDITORIAL COMMENT

As discussed elsewhere in this issue, there are at least three different versions of MZ-80K Disk Basic SP-7011 in circulation. The "new" version above, on disk 100, has actually been around for some time, having been produced by David Jackson for the Club during Yeovil days, including a superb English translation of the 7011 Instruction Manual programme. At last, thanks to Alan's mammoth efforts to reorganise the MZ-80K disk Library, this disk has been specifically catalogued as something different. Furthermore, it has recently been enhanced by John Edwards to include an "AUTO RUN" facility, and "PRINT@". Alan has also very sensibly decided to help those who use the original French version of SP-7011 on disk 102, which drives Epson printers, by putting David Jackson's English translation of the SP-7011 Instruction Manual programme on this disk as well.

XXXXXXXXXXXXXX

## DIS.COM - A VERSATILE CP/M DISASSEMBLER FOR THE MZ-80A/B

The Sharp Users Club have recently received permission from Dr. Brian Gladman, as author, and Kuma Electronics Ltd., as agents, to make the above programme available to members, on the understanding that neither Dr. Gladman nor Kuma will be expected to provide support for the programme in any way whatsoever.

DIS.COM was written Dr. Gladman for his own use, under CP/M on the MZ-80A or the MZ-80B. It is a very powerful Z80 disassembler, once you have learned to drive it, and is much more useful than the DDT utility supplied with CP/M, which can only handle 8080 Assembly language. Apart from the advantage of handling Z80 Assembly language, DIS.COM has two other features which make it preferable to many other disassemblers. The first is that it can disassemble any file as if it were sitting in its normal location, even though all files are actually loaded at 2100H. The second is that the addresses of all instructions, data blocks, and messages can be pre-defined in a table which remains valid after a disassembly, and does not have to be defined all over again before a second run (though it can be changed if necessary). Another small but helpful feature is that large blocks of NOPs, if defined as data, are automatically listed, in one line, as one large DS.

Maurice Hawes has had a copy of DIS.COM for nearly a year, and has written a 2-page summary of its use, covering all the most useful commands in detail, and listing the ones he has not been able to sort out. Essentially the disassembler is very useable; it is even possible to disassemble Sharp tape files, by first transferring them to a CP/M disc using "CMT". For example, Maurice has been able to use DIS.COM on an MZ-80A to disassemble the MZ-700 and MZ-800 Monitors-in-RAM as if they were sitting at 0000H, and the MZ-700 FD boot eeprom as if it were sitting at F000H. In other words, the programme can be used to disassemble any machine-code programme which can be got onto a Sharp CP/M disc, and is not restricted to CP/M .COM files.

DIS.COM will be dealt with as a "special", by Maurice. If you would like a copy, send a blank disc and £2-00 to cover photocopying and return postage to him at 18, Salop Street, Bridgnorth, Shropshire WV16 4QU.

\*\*\*\*\*

## MBASIC under CP/M on the MZ-80A/B

S.U.C. Member Doug Grout recently enquired whether there was a Basic interpreter available for CP/M on the MZ-80A. We have an MZ-80B CP/M disc with MBASIC on it, and knowing that the CP/M disc formats are the same on the MZ-80A and the MZ-80B, we gave MBASIC a whirl on an 80-column MZ-80A. It appears to work perfectly satisfactorily (if you can call the crude line editor in MBASIC satisfactory, and if you can remember to type a space after every keyword!!!!). For anyone who wishes to experiment, and is not familiar with MBASIC, a very good summary of its commands and syntax appears on pages 135-139 of "CP/M - THE SOFTWARE BUS". For a full review of this book see Vol.7 No.2 p.6. \*\*\*\*



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MZ80A News

### EDITORIAL

I enjoy receiving phone calls from members. However, there are difficulties, as some phone calls inevitably come just when it isn't convenient! In such cases I can't give the attention to a member that I would like and must sound rather off-hand; and later I often realise that there might have been a much better answer to a problem than the one I gave. In a nutshell, phone calls are best when they have news or ideas to give me, or feed-back from something that has appeared in the magazine; but letters are far better if you have a problem which requires a lengthy or complicated answer. With a letter, I have a chance to look up references and consider angles which do not occur to me immediately, and give a far more useful response.

### SA-5510 UNDOCUMENTED RESTORE FACILITY - Chris Hearn

Chris Hearn has discovered that in SA-5510 the description of RESTORE statement on page 109 of the MZ-80A manual is incomplete. There should be an additional example and paragraph, e.g:-

```
10 READ A,B,C
20 RESTORE 200
30 READ D,E
100 DATA 3,6,9,12,15
200 DATA 18,21,24,27
```

The READ statement on line 10 substitutes 3, 6 and 9 into variables A, B and C respectively. Because of the RESTORE 200 statement, the READ statement on line 30 substitutes not 12 and 15, or 3 and 6, but 18 and 21 into D and E respectively.

### SCREEN DUMPS TO TAPE

Asked on the phone how to do dump a screen to tape, my immediate response was that a three line BASIC program would do the trick. I had in mind something like this:-

```
10 WOPEN"SCREEN DUMP"
20 FORX=53248T054247:A=PEEK(X):PRINT/TA:NEXT
30 CLOSE
```

After entering the program you clear the screen and fill it with whatever graphics/text you want. You then scroll the screen up one line before entering "RUN"; this prevents the command, which would otherwise be within the 1000-character memory area being saved, from being picked up by the program PEEKs.

Of course, there are other ways of achieving the same result. SHARP data tape-filing routines are rather slow. It takes virtually three minutes to save a screen using the method above. If the screen is saved as a machine code file it can be saved in only half a minute. The technique is much the same as in the

previous example; start by clearing the screen, then fill the screen with text/graphics, and finally scroll the screen so there are enough blank lines at the bottom to POKE as follows:-

POKE4354,\$E8	To set the tape file length to the number
POKE4355,\$83	of screen locations, 1880, (\$03E8)
POKE4356,\$80	To set the start of the file to the top of
POKE4357,\$D8	"video ram", 53248, (\$D800)
POKE4358,\$58	To set the execution address to \$1258, the
POKE4359,\$12	SA-5518 warm start address.

Finally, POKE 4337-4353 with appropriate Sharp ASCII values to represent the file title, not forgetting a final (13), the code for carriage return. The file may then be saved with the command USR(33):USR(36). A screen dumped to tape with this technique can be re-loaded with the command USR(39):USR(43).

### IMPROVING CPE HI-RES/EP

Following the review of CPE HI-RES in Vol.7 No.1 p.9, I purchased a copy of CPE HI-RES/EP to run on my system, which includes a Mills-Harris Printerface and Epson RX-88F/T. Installation of the program was not without incident, so I feel it worth expanding a little on the earlier article.

I reported in my Printerface review (Vol.5 No.2 pp.51-52) that I had never needed to touch its DIP switches since its installation. That has changed, as HI-RES requires the "transparent" mode. Once that was sorted out, I had to phone again as no line feeds were being sent to the printer. Chris Hearn returned my call with a set of six POKES to cure the problem. They were:-

POKE\$31AE,\$F3	POKE\$31D4,\$80	POKE\$31F7,\$8A
POKE\$31AF,\$31	POKE\$31D5,\$80	POKE\$31F8,\$C3

The opening sentence of the HI-RES manual says it allows "the printing of all the Sharp characters". This is not true. What it does allow is printing of the Sharp ASCII character set. It does not deal with the additional characters in the display code set, though, normally, this is only of consequence if you intend to do screen dumps. When listing programs these additional characters will only be referred to by their display code number and not the character itself.

A small limitation of HI-RES is that it does not allow the printing of graphics in special typefaces, such as bold or double width. The printer patch detects graphics and places the printer in single density bit image mode, returning to the previously set typeface for other characters.

The last problem I had was with some of the characters which appeared on print-out. Here, I began to come to terms with the problems which had to be overcome in writing HI-RES. Characters appear on the screen of your MZ-80A as dots within a 8x8 grid. A Sharp printer generates the same 8x8 grid of dots and so echoes

the screen character exactly. But in an Epson printer ROM the main character set works with an 9x5 matrix, and many characters use half spaces between the five columns, making in effect a laterally compressed 9x9 grid. However, to generate non-standard characters, bit image mode is used. This only allows access to eight rows of dots, and if all the necessary data for generating the non-standard Sharp characters are to be fitted in the spare area within SA-5510, the grid cannot have more than six columns; because of the different spacing between the rows and columns, this produces a virtually square pattern of dots.

In CPE HI-RES v4.0, the version I received, the character set which is inserted into SA-5510 is initially loaded into the area 7C13H-8B02H (after making the various tests referred to in the earlier review it is moved to its final location). The first 36 bytes of this area contains the data for the "cursor control" characters, CHR\$(17)-CHR\$(22). Immediately after this comes the data for all the characters from CHR\$(94), the first of the Sharp ASCII set which differs from standard, to CHR\$(255). I detail all this because I found I wanted to change many of the dot patterns and this information will be useful should you wish to do the same. However, you will need to use a program such as Z80 MACHINE or CLUB MON, because when the patch is loaded after BASIC, it auto-executes, relocates itself, and then performs a new Basic cold start, which erases the original code. The addresses given below relate to the original code, before execution.

The first thing I noticed when running the demonstration program which comes with CPE HI-RES, is that three of the characters produced belong not to the MZ-88A, but to the MZ-88K character set. These are CHR\$(139), CHR\$(144) and CHR\$(147). Then I noticed that the four other characters which differ between the two character sets were being printed correctly, but from the Epson's ROM set, not from the data at 7C13H-8B02H. Finally, I realised that the three mis-printing characters were also available from the Epson's ROM. Looking at the relevant code, it was clear that a major re-write would be needed to enlarge the original conversion table at 7A7BH-7A81H, which includes only five changes, to allow it to cope with three extra changes; so I redirected the relevant code to a new and bigger table by making the following changes (original values in brackets):-

7A55	FE (3B)	RELOCATED table address 1
7A56	44 (32)	RELOCATED table address 2
7A58	88 (85)	Number of entries

The first pair of bytes in the original table changed the pound sign to a hash. In the new table given below, which sits at 7D6FH-7D7EH before relocation, this change may be omitted by setting 7D78 to FB instead of 23:-

(7D6FH) FB 23 88 7D BE 7B C8 7C 94 7E 8B 5E 98 5F 93 68

There is no room here to detail the 60 or so changes I made to bit-image graphics; but they are all straightforward if you understand how to build up bit-image data. If you would like details please write to me, Greg Chaman, address as given at the head of this section.

MZ-80A LIBRARIAN  
Ian Baldwin  
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STAFFORD ST17 9BX



Library News

### LIBRARY SUBMISSIONS

The list of programs available from the MZ-80A Section Library remains as published in Vol.7. No.2. except for the changes noted below. The programs on the two new tapes, by Jac van Schoor and Maurice Hawes, are covered in detail elsewhere in this Section.

The MZ-80A Library is under-utilised at the moment, and badly in need of new submissions. They do not have to be brand new programs; we all know that many of the programs in the current list are old and poorly written. I am sure that many members, having received copies of programs in the past, will have improved them in a number of ways. The library would welcome improved versions of existing programs in the library as much as completely new material. Please send a copy of any submission to me at the above address, together with a brief description of the program for inclusion in the magazine. Where documentation for programs is required, it is best sent either in the form of a WDPRO file on tape, or as masters ready for photo-copying. Given the current lack of support from any commercial source for MZ-80A software, the only way to let the wide world see your programming skills is to make a donation to the Library, so come on, send in your contributions to give our Library a good start for 1988!

### NEW PROGRAMS

TAPE 58BAMC: SECTOR R/W; SECTOR R/W(NEC)  
TAPE 58PAMC: HU-BASIC.A2/80S; HU-BASIC.A2/80M

### BUGS

A minor bug has been discovered in UNDERGROUND ADV on tape 120A. In line 460 the expression "V = 1" should read "V = 2". It simply allows an alternative message of the "don't understand/doesn't make sense" kind to be printed.

### WITHDRAWALS

The author of the programs on Tape 244A has written to point out that these programs are all the subject of copyright. Therefore the Club is not free to distribute them.

### SPECIAL REQUEST PROGRAMS

As recorded elsewhere in this Section, the new toolkit, XPATCH 5510 v2.1, for use with BASIC.5A-5510, is now available as a "special request" program from Greg Chapman, (34 The Rookery, Orton Wistow, PETERBOROUGH, PE2 8YT). This is in addition to the other "special request" programs DISASSEMBLER BA80 and B880 MASTER (see Vol.7. No.2. p.12), available from Maurice Hawes (18 Salop Street, BRIDGNORTH, Shropshire, WV16 4QU). To cover the cost of duplicating the manuals for any "special request" package you should send a cheque for £2.00 made payable to "Sharp Users Club" together with a blank tape, to the appropriate address.XXX

# HU-BASIC on the 40/80-COLUMN MZ-80A

By Maurice Hawes

About a year ago I had the Kuma 40/80-Column conversion fitted to my MZ-80A. Such a conversion is virtually essential for running CP/M, particularly for word-processing programmes such as WDFPRO, but it does bring problems when trying to run some programmes, especially those written for the MZ-80K, because the new 40/80 column Monitor ROM leaves the machine without the MZ-80K 40-column mode, in which the top L.H. corner of the screen is kept at D000H. This does not seem to create too many problems with programmes which use standard Monitor calls to do their screen-handling; with such programmes it is usually sufficient to ensure that the machine is in 40-column mode (1191H set to 00), and that any code involving port E003 is cut out. The programme will then run O.K. in 40 columns e.g. Disassembler BA00 (see Vol.6 No.2 p.38).

Some other programmes use their own internal screen-handling routines, and this does create other problems. Z80 MACHINE, for example, has an internal routine to return the current cursor position in HL; in this case the problem may be solved by substituting the appropriate, changed code in the new Monitor. HU-BASIC is much more complicated, and to achieve its sophisticated screen-handling, it uses many internal routines, which create severe problems. I made many attempts to get HU-BASIC working satisfactorily in 40 or 80 columns, and eventually, after many headaches, I thought I had succeeded with 40 columns. However, when I sent a copy to Alan Bunting, he telephoned me the next day to say that he was not getting any prompts after LOAD and SAVE. Investigation showed that they were being sent to that part of the MZ-80A VRAM which is not visible. This can be overcome by a machine-code clear-screen before doing a LOAD or SAVE; this sets the top L.H. corner of the screen to D000H. Unfortunately, CLS in HU-BASIC does NOT do this, as it has to allow for the CONSOLE setting. I therefore wrote a simple routine to clear the whole screen and jump to a warm start at 1200H, called it "CMT", and put it in place of "OUT".

Alan came back again to say O.K., but he still had the problem when his programme included data-filing routines, because "CMT" stopped the programme! Fortunately the solution was simple, as HU-BASIC commands return to the execution loop with C9 (RET); so I replaced my original C3 00 12 with C9, and "CMT" became programmable. It is a useful command in its own right, as it will ALWAYS clear the WHOLE screen, whereas "CLS" only clears the part defined by CONSOLE.

I also took the opportunity of incorporating the modification suggested by Don Cram, that the CTRL/A and CTRL/^ functions should be interchanged. Thus, in the new 80-column versions of HU-BASIC, CTRL/A toggles the keyboard case, and CTRL/^ joins the cursor line with the one above. The resulting programmes are now on Tape 509AMC in the MZ-80A Library; HU-BASIC.A2/80S has a Sharp printer routine, and HU-BASIC.A2/80M has a printer patch which produces ASCII lower-case, and "." for Sharp graphics.

\*\*\*\*\*

XPATCH 5510 v2.1  
An Introduction and Overview

By Greg Chapman

INTRODUCTION

In the last issue of the magazine you will have read that a "suberb toolkit for SA-5510" was being prepared by Chris Hearn. More work has been done and additional facilities added since writing the trailer. By the time you read this, the program will be ready for distribution as a "special request" program. This means that if you would like a copy you should send a blank tape and cheque for £2.00 made payable to the "Sharp Users Club" to me (Greg Chapman, 34 The Rookery, Orton Wistow, PETERBOROUGH, PE2 8YT). A full nine pages of documentation meant that it was not practical to find the space in the magazine to reprint it in full.

Originally, I was hoping to provide members with APPEND and RENUMBER commands, which Maurice Hawes had suggested were the most important missing ones in SA-5510, but Chris sent a patch which included much more. My comments led to version 2, with more commands, and even more comprehensive documentation. What the Club now has is something that really will help the de-bugging process and make the task of extending and adapting existing programs, especially those written by others, almost a joy!

FACILITIES

XPATCH is compatible with CPE HI-RES. This means it uses none of the space occupied by HI-RES. The disadvantage of this is that it intrudes into available memory, which is reduced to 30820 bytes. However, this is not a real problem as XPATCH is intended as a development tool rather than a new BASIC dialect. You can always revert to standard SA-5510 for running your program.

XPATCH includes the full string handling routine seen in the last issue. It offers a faster data filing routines, almost twice as fast, yet the recordings are totally compatible with those made under standard SA-5510. Additionally, "Found" and "Loading" messages are printed on the screen. A new form of listing pause is added. This allows single stepping through a listing in place of the normal facilities through the "?" key and space bar.

NEW STATEMENTS

In keeping with the "development tool" intention of XPATCH, only two new program statements have been added. PRINT@X,Y was one of the facilities which Chris added "because it takes up so little extra code". I suggested that CLS, as a natural partner, ought to be added. Programs written without the use of these two statements remain entirely compatible with standard SA-5510.

ADDED COMMANDS

SP-5060's RENUM command allows you to move blocks of code around a program. I was disappointed to find that XPATCH's

version had a range check, to ensure that existing program lines could not be over-written, and prevented this. I argued strongly with Chris on this. He wished to keep his command's algorithm, being justifiably proud of its speed, beating SP-5060 into the ground. However, he eventually conceded some of my arguments and XPATCH now includes a MOVE command, whose syntax is exactly the same as RENUM's but has no range check.

APPEND, unlike the version published in Vol.7 No.2 allows a program name to be specified in a similar fashion to a conventional LOAD. DELETE allows removing a block of code from a program. A variant allows program lines to be deleted in which given text is present.

FIND was something which I had added to my list of requirements, when I originally wrote to Chris. XPATCH's implementation is very versatile, allowing the inclusion of double quote marks and leading spaces, for instance. CHANGE builds on the FIND command and will replace all occurrences of the text to be found with another. There is a facility which allows confirmation of each substitution, if required.

COMPRESS is both a REM and space stripping command. Chris suggests its use should be in the production of fully commented source programs, which are then compressed and renumbered to produce a working copy which may well then take up less space than XPATCH uses itself.

The final command which Chris came up with was XREF. "I'd seen the idea somewhere else and wanted to have a go at producing it for the Sharp", he said. In my experiments with XPATCH, hacking about in a commercially produced, but poorly written, program, this command was invaluable. I would go so far as to say it was worth getting XPATCH for even if it contained nothing else. What it does is list all program variables and the lines in which they occur. Optional hard-copy can be produced. Using the command, I found it easy to trace redundant code and program errors. Additionally, I could decide where sub-routines should be written to replace duplicate chunks of code and generally reduce the number of program variables. All of which leads to more compact and faster running programs.

## INSTALLATION AND DOCUMENTATION

Installing the patch is simplicity itself. Should you be installing the patch on top of CPE HI-RES a further command is available which allows you to select or de-select printer line-feeds. This command was introduced after hearing about my problems with a Mills-Harris Printerface.

The documentation is comprehensive, explaining, in detail, use of all the commands. The final page lists a number of POKes, which amend the facilities described in the main body of the manual, useful routines within XPATCH, which can be called from a program, and details of where XPATCH code sits in memory and where remaining space is.

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A DISC SECTOR READ/WRITE PROGRAMME FOR THE MZ-80A

By Jac van Schoor

I have long wanted a disc sector read/write programme for my MZ-80A, and began by trying to write one of my own, based on a study of the Western Digital data sheets for the MZ-80A FD Controller chip MB8866. Then, whilst browsing through the MZ-80A FDOS Manual for disc I/O information, I came across PROM FORMATTER, and realised that it contained all the essential code for a sector read/write utility.

To cut a long story short, I modified the PROM utility to block unwanted commands, and removed the inhibition which prevents it from reading or writing to tracks 0, 1 and 2. The resulting programme, "SECTOR R/W", is some 22k long, of which only about 4k are actually used, but this does not matter, as a read/write utility programme uses very little space and there is more than enough left. "SECTOR R/W" loads from tape via the Monitor, sits at 1200-594FH, and executes at 47BBH. The Menu is largely self-explanatory, but note the following points:-

- 1) The command prompt is "\*"; commands (CY, CS, M, &, #, ?, ! ) require confirmation with "CR". Any other entry will cause the Menu to be redisplayed.
- 2) Entry of "CY" or "CS" calls for further inputs which do NOT require confirmation with "CR":-

DRIVE calls for a single digit (1-4)  
TRACK,SECT calls for 4 hex digits (see \* below)  
BYTE SIZE calls for 4 hex digits (see \*\* below)  
ADDR calls for a 4-digit hex address (see \*\*\* below)

CAUTION is needed when entering these numbers; if a mistake is made, "CR" may be used to return to command mode; otherwise the relevant R/W command is carried out automatically as the last digit of ADDR is entered.

- 3) The "&" command returns to the Monitor after zeroing the free memory; use "J47BB" to return to command state.
- 4) The "#" command toggles the printer on/off.

-----

\* The TRACK,SECT input is actually two 2-byte hex numbers; the first is the track (00-45H), and the second is the sector (01-10H). For example, 0F0A for track 15, sector 10.

\*\* The BYTE SIZE information gives the number of bytes required, but must always be a multiple of 256; therefore the first two digits represent the number of 256-byte sectors, and the last two digits are always "00".

\*\*\* ADDR is the start address in free memory, from which the data is written or read as the case may be.



# Notes on MZ-80A Directory Format

When using SECTOR R/W to find a programme on a disc you will need to know how the MZ-80A directory information is arranged (it is not all as logical as on the MZ-80K). The MZ-80A directory starts at Track 01, Sector 01, and uses 32 bytes for each file, as follows:-

```
01    = filetype
02-18 = filename
19    = (un)locked
21-22 = size
23-24 = load address
25-26 = execute address
27-30 = unused(?)
31-32 = scrambled track/sector information, in form "ABCD".
```

Bytes 31 and 32 caused me a lot of head-scratching. Labelling the four hexadecimal digits in these bytes A,B,C, and D, then "DA" gives the track, and "CB+1" gives the starting sector on that track. In other words, the sector numbers are stored as 00-0FH, even though they are referred to as 01-10H elsewhere, and the track and sector information is scrambled.

For example, if bytes 31 and 32 contain DA 01, then the programme starts at Track 1D, Sector 0B. Sharp seem to have gone even further than usual, to make life difficult here. Never mind, we now know the secret!!

\*\*\*\*\*

## EDITORIAL NOTE

Jac's programme is a gem; just what MZ-80A disc users have been waiting for all these years, to put them on a par with their more fortunate brothers who use discs on the MZ-80K or the MZ-80B. Operation is simplicity itself once you have grasped the principles of addressing the correct sectors, and the facility to send all screen output to the printer makes it very easy to keep a record of what you have done.

The printer routine in the original PROM programme was, of course, for Sharp printers, and Jac has not changed it. Like many MZ-80A owners, I use a standard printer, and I therefore had to patch in code to convert Sharp ASCII lower-case codes to standard ASCII lower-case codes, and to convert Sharp graphics to "." I did this by shortening the error message "-System Error, RE-BOOT FDOS !!" to "REBOOT!", and used the space thus created for my printer patch. I called the programme "SECTOR R/W(NEC)" because my printer happens to be an NEC PC-8023; but I would guess that the programme would work with other standard ASCII Centronics printers.

"SECTOR R/W" and "SECTOR R/W(NEC)" have recently been added to the MZ-80A Library, on tape 50BAMC.

\*\*\*\*\*

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MZ80B News

As you will no doubt have read elsewhere in this magazine there are to be a few changes within the administration of the Sharp Users Club. From now on the editing of this MZ-80B section will be in the capable hands of John Ibberson to whom all future reports should be sent. I will become Treasurer of the Club effective from 1st November 1987.

Thanks for contributions to this edition must go to John Ibberson and Andrew Ferguson, not forgetting John Edwards, for their untiring work on the Screen Handler project, and to Maurice Hawes for his sterling work in converting the Clubs Supertape to run on the MZ-80B.

I'd like to thank all members who have sent material for this section during my term as sub-editor and I trust you will continue to give the same support and encouragement, if not more, to John Ibberson from now on.

I have details of two computer systems for sale - as follows :

MZ-80B + dual disk-drives + graphic cards + P6 printer + tape & disk software. £400.00

MZ-80B + dual disk-drives + graphic cards + modem + printer-card + modem + tape & disk software. £350.00

For further information on either system please contact me at the above address.

```
*****
*                                     *
* PLEASE NOTE - Your new Editor for the MZ-80B section is *
*                                     *
* JOHN IBBERSON *
*                                     *
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* CHESTERFIELD *
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*                                     *
*                                     *
*****
```

Adapting the Xtal screen handler for the 'B' and the 'K'

by John Ibberson and Andrew Ferguson

This article does not attempt to provide complete solutions to the requirements which it outlines. Rather it describes the problems and leaves it to you, the members, to offer solutions. Those of you with a competitive spirit read on! In the last issue Larry Galliford presented us with an excellent screen handler for Xtal Basic. However, as he mentioned, there is a need to translate this program so that it can be used with Sharp's own Basics. The only change required is to include some code to imitate Xtal's SCRN\$ function. It is easy enough to do this in Basic, but Basic is too slow. The requirements for the 'B' and the 'K' are different, mainly in so far as the 'K' requires conversion of the Display codes to Sharp ASCII. On the next page there is a LISTING of a subroutine written for SB-5510/6510/6511. The subroutine is quite short (using LINES 100-140). The rest mainly comprises two demonstration programs. LINE 2 is worth noting as it shows a method of checking to see if the screen is in 40 or 80 column mode.

The equivalent LISTING for the 'K', using SP-5060 is sufficiently different to warrant a separate LISTING, so this is also published, following that for the 'B'; for convenience the test routines have been reproduced too, though they are essentially the same. The subroutine is covered by LINES 100-135, (though this calls the machine code subroutine which is installed by LINES 1010-20, namely the Display/ASCII conversion routine). A few comments may be helpful. The USR call in LINE 110 is for the Display/ASCII conversion. LINE 115 ensures that all ASCII codes below 33 are converted to spaces. If this is not done cursor codes produce problems; also note that SP-5060VME and earlier won't PRINT CHR\$(32) as a space, so this LINE is necessary for dealing with spaces. LINES 120-125 are likewise designed to deal with the shortcomings of earlier versions of 5060, which won't print quotes or commas from their ASCII codes. The POKE 6350,0 is required to allow quotes, CHR\$(34), to be read into the appropriate variable.

So there are the two LISTINGS. One for the 'B' and one for the 'K'. The scene is now set to leave open a challenge to those of our members who like working in machine code. What is required is a bit of machine code such that the <GOSUB 100> in LINES 1210 and 1380 can be replaced by a USR call. A more elegant solution would be to provide code to implement SCRN\$( ) so that it operates in precisely the same way as the SCRN\$( ) function in Xtal 3: i.e. <SC\$=SCRN\$(6)> would store row 6 in a variable: SC\$ in this example. It might be possible, as is suggested by this example, to retain free use of SC, SC\$, and SC( ), with the function being recognized by all its characters. However any machine code solution would be acceptable. Note that machine code is certainly needed. The 'B' takes 11 seconds, or 23 secs in 80 column mode, to store the whole screen; the 'K' (with its ASCII conversion) takes 37 seconds. This is a friendly competition, with only glory to be won! We hope to include the best solutions, both for the 'B' and the 'K' in the next magazine. Please send your contributions, covering either or both machines, to John Ibberson.

# Sharp Users Club - MZ-80B Section - Screen Handler

## PROGRAMME FOR MZ-80B

```

1 PRINT CHR$(6))
2 INP@232,Z1:REM PORT 232 CONTAINS 19 or 51 according to 40/80 column mode
3 IF Z1=19 THEN Z1=39:REM and the routine auto-adjusts for mode selected.
4 IF Z1=51 THEN Z1=79
5 GOTO1000
19 REM *****
20 REM # 88-5510/6510/6511 routine which duplicates Xtal's SCRN# function, #
21 REM # together with two demonstration programs *****
22 REM *****
96 REM
97 REM ----- SCRN# function subroutine. Sharp recognises only
98 REM SC# as the variable name. SCRN# is used for consistency with Xtal 3.
99 REM
100 REM The interpreter recognises SCRN# AS SC#.
105 SCRN#=""
110 FOR X=0 TO Z1
115 AS#=CHARACTER$(X,Y)
116 IF ASC(AS#)=0 THEN AS#=" ":REM Changes 'BLANKS' to 'SPACES'
135 SCRN#=SCRN# + AS# : NEXT X
140 RETURN
997 REM *****
998 REM ----- Initialisation.
999 REM
1000 IF J>0 THEN 1100
1079 REM *****
1080 DIM SCRN$(24): REM Only required for reading the whole screen.
1097 REM *****
1098 REM Demonstration programs.
1099 REM
1100 FOR I=1 TO 57: J=INT(RND(1)*224+32): J=J+(I*(J-107))+(I*(J-109))
1105 PRINT CHR$(J): " :NEXT:PRINT CHR$(34):PRINT":PRINT
1110 PRINT"Please select choice"
1115 PRINT" <1> Demonstration program for storage of 1 screen row.
1120 PRINT" <2> Demonstration program for storage of whole screen.":PRIN
T
1125 GET Q$: IF Q$="" THEN 1125
1130 IF VAL(Q$)=2 GOTO 1300
1135 IF VAL(Q$)>1 GOTO 1125
1197 REM *****
1198 REM Option 1 demo.
1199 REM
1200 INPUT"Which screen row do you want returned? (top row is 0): "Y
1210 GOSUB 100: PRINT"Screen row"Y" contains:":PRINT SCRN$: END
1297 REM *****
1298 REM Option 2 demo.
1299 REM
1300 PRINT"Please wait 11(23) seconds and all the
1310 PRINT"screen will be stored in the SCRN$()
1320 PRINT"array. (Control codes are stored as
1330 PRINT"spaces). When the program ends, clear
1340 PRINT"the screen (if you wish) and then, to
1350 PRINT"view this page again, ENTER: ":PRINT"RUN 1400"
1380 FOR Y=0 TO 24: GOSUB 100: SCRN$(Y)=SCRN$: NEXT: PRINT"Finished!"CURSOR 0,
20: END
1399 REM
1400 PRINT CHR$(6)): FOR Y=0 TO 23:PRINT SCRN$(Y):NEXT:PRINT LEFT$(SCRN$(Y),(Z
1-1))
1420 CURSOR 0,19
1430 END

```

# Sharp Users Club - MZ-80B Section - Screen Handler

## PROGRAMME FOR MZ-80K

```

1  GOTO1000
19 REM *****
20 REM * SP-5025/5060 routine which duplicates Xtal's SCRN$ function, *
21 REM * together with two demonstration programs. Ed. 13.5.87 *
22 REM *****
96 REM
97 REM ----- SCRN$ function subroutine. Sharp recognizes only
98 REM SC$ as the variable name. SCRN$ is used for consistency with Xtal J.
99 REM
100 SCRN$="": S=53248+Y*40: REM The interpreter recognises SCRN$ as SC$.
105 FOR X=0 TO 39
110 POKE 53247,PEEK(S+X): USR(52952)
115 AS=PEEK(53247): IF AS<33 THEN AS$=" ": GOTO 135
119 REM Next two LINES would not be required with 5025.K2 and 5060.K2.
120 IF AS=34 THEN POKE 6350,0: AS$=CHR$(34): POKE 6350,34: GOTO 135
125 IF AS=44 THEN AS$="," : GOTO 135
130 AS$=CHR$(AS)
135 SCRN$=SCRN$+AS$: NEXT X: RETURN
997 REM *****
998 REM----- Initialization.
999 REM
1000 IF J>0 THEN 1100
1009 REM -----Display to Sharp ASCII conversion.
1010 LIMIT 52951: FOR I=52952 TO 52961: READ J: POKE I,J: NEXT I
1020 DATA 58,255,207,205,206,11,50,255,207,201
1079 REM *****
1080 DIM SCRN$(24): REM Only required for reading the whole screen.
1097 REM *****
1098 REM Demonstration programs.
1099 REM
1100 FOR I=1 TO 55: J=INT(RND(1)*224+32): J=J+(1*(J=107))+1*(J=109))
1104 REM The POKE 6350 is to enable CHR$(34) to be PRINTED for test purposes.
1105 PRINT CHR$(J): " ":NEXT:POKE 6350,0:PRINT CHR$(34):POKE 6350,34:PRINT", "
1110 PRINT"Please select choice"
1115 PRINT" (1) Demonstration program for storage of 1 screen row.
1120 PRINT" (2) Demonstration program for storage of whole screen."
1125 GET Q$: IF Q$="" THEN 1125
1130 IF VAL(Q$)*2 GOTO 1300
1135 IF VAL(Q$)<>1 GOTO 1125
1197 REM *****
1198 REM Option 1 demo.
1199 REM
1200 INPUT"Which screen row do you want returned? (top row is 0): "Y
1210 GOSUB 100: PRINT"Screen row";Y: " contains:":PRINT SCRN$: END
1297 REM *****
1298 REM Option 2 demo.
1299 REM
1300 PRINT"Please wait 39 seconds and the whole
1310 PRINT"screen will be stored in the SCRN$( )
1320 PRINT"array. (Control codes are stored as
1330 PRINT"spaces). When the program ends, clear
1340 PRINT"the screen (if you wish) and then, to
1350 PRINT"view this page again, ENTER: ": PRINT"RUN 1400!!"
1380 FOR Y=0 TO 24: GOSUB 100: SCRN$(Y)=SCRN$: NEXT: PRINT"Finished!": END
1399 REM
1400 PRINT"@": FOR Y=0 TO 23:PRINT SCRN$(Y): NEXT: PRINT LEFT$(SCRN$(Y),39):
1420 PRINT"END": END

```

## CREATING IPL FILES FOR THE MZ-80B

By Maurice Hawes

About 2 years ago a local member who had just acquired an MZ-80B asked me how to make a backup copy of SB-1510 + SB-5510, as he could not find instructions in any of the Manuals. At first sight this would appear to be easy; just find out where the code starts, finishes, and executes, and use the "S" command of the Monitor to make the copy. Unfortunately, this does not work, because as the Monitor copies itself, bytes change within the copied area, and the resultant tape gives "CHECKSUM ERROR".

The solution was first brought to my notice by R.A. Wymark, in SHARPSOFT USER NOTES No.4, pp.91-92; simply move the code to be copied to a position outside the Monitor, and copy it from there. The same article also shows how to alter the relocated code before copying it, so that the main interpreter executes on boot-up. Now that we have SUPERTAPE 2B, this method of copying a system tape is redundant but, as I recently discovered, it is still a useful tool if you want to create a system file which incorporates the SB-1510 Monitor and can therefore be run from the IPL. The essentials of the method are as follows:-

Load SB-1510, then the programme to be saved as an IPL file. Reset to MON and use the "M" command to put the following programme at high in memory (N.B. this programme must be higher in memory than the relocated code, D000 is usually O.K.):-

```
D000 21 00 00 ;LD HL,0000H
D003 11 00 00 ;LD DE,0000H
D006 01 XX XX ;LD BC,XXXXH; XXXX = size of file + SB-1510
D009 ED 00 ;LDIR
D00B C3 00 00 ;JP 0000H
```

Execute the above programme with "J" #D000. Then, if you want the saved copy of the IPL file to execute on boot-up, use the "M" command to change 80AE-0000H to C3 YY YY (YY YY = cold start address of file). Finally, use the "S" command to perform the save, from 8000H to 8000+XXXXH, without specifying a "J" address, which will be inserted automatically.

I recently made the first copy of "SUPERTAPE 2BM", by loading "SUPERTAPE 2B" above SA-1510, and then carrying out the above procedure. The header details of these and other tapes, obtained by loading them into "SUPERTAPE 2BM", shows how the different programmes were saved:-

PROGRAMME	TYPE	SIZE	START	EXEC
SUPERTAPE 2B	1	0400	1300	1300
SUPERTAPE 2BM	1	1780	8000	00B1
SB-5510 (Master)	1	496B	0000	0000
Hu-MONITOR V.2.2	1	1800	A000	0000
Hu-GBASIC V1.1	1	6A3C	1800	16A0

I leave you to interpret the above information. Answers in the next issue !! (Remember that IPL loads any systems file at 8000H, then switches 8000H to 0000H, and then executes the file.) \*\*\*

## DETAILS OF SHARP DISC BASIC SB-6511

By John Ibberson

In the last edition of the Magazine, a request was made for information about Basic SB-6511. This Basic was supplied to me when I bought my MZ-80B; there was no Manual or documentation of any kind, but since it was included in the purchase I didn't complain! I was told "It's very much like the tape Basic but with the disc commands of SP-6115" (which I had been using on my trusty old MZ-80K).

Armed with this information, I found little difficulty in using SB-6511, once I had recovered from the shock of NO REPEATING KEYS (except for the cursor keys) and NO BLOCK LINE DELETION.

Subsequently, I purchased an RS232 card, and with it came a Manual which, in three pages, described SOME of the features of SB-6511. In effect, it is an upgraded version of SB-6510 and includes the commands APPEND, RSMODE, RSO and RSI; it is designed to operate the SERIAL INTERFACE CARD (MZ-8B103) and the UNIVERSAL I/O CARD (MZ-8B104). At boot-up 35820 bytes are free, instead of the usual 38636 bytes free with SB-6510.

To use RS232 from Basic, the command RSMODE allows the setting of channel selection, received/transmitted character bits, stop bits, and receive active/inactive. The command RSO is used to OUTPUT string data via a specified channel, and the command RSI is used to INPUT string data via a specified channel.

On examination of the reserved-word tables of the two Basics (both at 4472-48A1H) it is clear that there are a further 20 extra commands in SB-6511 which are not documented in the RS232 Manual. Presumably these are capable of handling the Universal I/O card, and are documented in yet another Manual! For the record, all 24 new commands are listed below, with their tokens:-

APPEND	80 B4	SRQ	80 D6
SSRQ	80 CB	SPOL	80 D7
GPIB	80 CC	LLO	80 D8
PPC	80 CD	DCL	80 D9
PPOL	80 CE	TRG	80 DB
PPU	80 CF	PCT	80 DC
REN	80 D0	RDS	80 DD
ICL	80 D1	RQMSG=	80 DE
LCL	80 D2	EOI	80 DF
CMD	80 D3	RSO	80 E0
WRT	80 D4	RSI	80 E1
RED	80 D5	RSMODE	80 E2

Comparing the above with the SB-6510 list previously published in this Magazine (see Vol.6 No.1 pp.17-19), it is clear that APPEND fits between AUTO (80 B3) and IMAGE/P (80 B5), and the remainder come after XOPEN (80 C9).

If any member has further information on these mysterious commands, please send us the details, and we will publish them in a future issue. \*\*\*\*\*

Your MZ-700 Editor is :-

Tim Cowell,  
17 Victoria Drive,  
Houghton Conquest,  
Bedford,  
MK45 3LZ.



MZ700 News

Telephone 0234 742273

This edition is a focus on the MZ700 Library, this has been promised for a long time now and because there is little else to offer I have finally got round to it.

#### Please Note

Yet again I have moved house, the new address is shown above, and the telephone number has not changed. My wife has asked me to have a mean about the hours that some people choose to telephone. Please don't phone after 10.30pm, and I will not be at home before about 6.30pm on Mondays to Fridays, so you have a whole four hours every day.

#### Modems

I believe that Peterson Electronics are looking for someone to write some communications software for the MZ700. There has certainly been a lot of talk amongst members recently asking for such software and general advice on using modems with the MZ-700. Can anyone who is successfully using a modem with the MZ-700 please get in contact with me or another club member and give details of the set-up they are using. There are some very nice modems on the market these days, the best value for money one I have seen is the Pace Linnet. This provides auto dial/auto answer V21/V23 at just over £100. The modem accepts the standard Hayes 1200 command set so it cannot be too difficult to write some code to drive it. The sort of features required are :-

- Select connect type (300 or 1200/75)
- Dial & Connect
- Programmable Function keys for passwords etc
- Hang Up
- Telephone & Auto log on directory
- Save data being received to a file
- Send data from a file (if disk, or memory area if tape)
- File transfer protocol ( ie XMODEM )
- Select 40 column or Simulate 80 columns by horiz scroll.

The modem will connect to the MZ-700 using a serial adapter available from Peterson Electronics or most other RS232 adapters, is the one described in Vol.6 No.1.

#### K&P Disks

It seems that the K&P Disk system is anything but a standard. Since my article on patching the utility program to be able to copy master disks, I have been inundated with complaints that it does not work. On investigation it seems that there are several different versions.



### 700-Library Special

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.



### Library News

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.

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.

#### Program Types :-

WP = Word Processor  
 DB = Data Base  
 L = Language  
 U = Utility  
 G = Game  
 A = adventure  
 E = Educational

#### Languages :-

MC = Machine code  
 S = S-Basic  
 F = Fortran  
 X = eXpress Basic  
 5025 = 5025 Basic

The programs currently available are :-

Name	Type	Language	Index	Description
Apothecary	E	S	ED1	Chemical Symbols.
As the crow flies	E	5025	100	Geography game.
Backgammon	G	S	LM2	No explanation needed
Breakout	G	MC	CG1	Classic Game
B*CODE2.D700/DCS	U	MC	DCS1	Converts DCS Basic to 700 Format.
Castle	A	S	LM1	
Cells & Serpents	A	S	LM1	
Cribbage	G	S	200	Card Game
Cribbage 700	G	S	LM2	Better than above.
Crypt	A	S	AD1	Good adventure game

# Sharp Users Club - MZ-700 Section - Library Special

Defender 700	G	S	LM2	Shoot game, not bad
Dog Star	A	S	AD1	Normal ? Adventure
Electron 2000	G	MC	CG1	V.Fast invaders game
Eye of Mordaeus	A	S	TS3	
Flag Rally	G	MC	CG1	Good but poor graphics
Flying Mission	G	S	LM2	Bombing
Football Manager	A	5025	CG1	Manage a football team
Fractions	E	S	ED1	Baffling fraction tutor
Geomaths	E	S	ED1	Explains formulae
Giants Gold	A	S	LM1	
Gomuko	G	MC	CG1	Version of Connect 5
Grand Prix	G	F	G	Fortran game ???
Hangman	G	S	CG1	You VS MZ700
Haunted House	A	S	LM1	
Head on 700	G	S	LM2	Bash game
Labyrinth	G	S	LM2	Walk around a maze.
Labyrinth	A	S	AD1	Good graphics
Livingstone	A	S	AD1	Search for Dr Livingstone
Logger/Frogger	G	X	CG1	Great version
Lost in Jungle	A	S	LM1	
Ludo	G	MC	LM2	OK if you like LUDO
Mind Out	G	S	CG1	Good logic game.
Mission X	G	MC	CG1	Great plane game
Monkey Mania	G	S	TS3	Another Bashem game
Mushroom 700	G	MC	CG1	Crazy/Colourful/Diff
Music	E	S	CG1	Music Playback
Mystery Mansion	A	S	TS3	
Night Fighter	G	S	CG1	Good graphics, shooter
Numbervaders	E	S	TS3	
N.America	E	S	LM1	Teaches N.American Geog
Octave	G	S	CG1	
Patience	G	S	LM2	Good game of patience
Poke Demo	D	S	TS3	Poke Demonstrator
Pontoon	G	S	LM2	Game of pontoon
Printer Fonts	U	S	Generates	Epson printer fonts.
Probe B600	U	MC	CUI	Easy used dissassembler
Pyramid	A	S	D1	good & complicated
Pyramid of Doom	A	S	LM1	
Record Tape Cat	U	S	61	List maintainer
RTclock	U	MC	CUI	Displays time on screen
Screen Designer	U	S	TS3	Designs titles etc
Secret Silver	A	S	AD1	Good
Sentence Proc	WP	S	CUI	Simple WP
Sharp Skying	G	S	LM2	Good but too fast ?
Shoplist	DB	MC	CUI	List maintainer
Sketchplot	U	S & MC	DS4	Screen Drawer
Slothudson	G	MC	LM2	?
Space Invaders	G	MC	CG1	Not in colour
Startrek	A	S	AD1	Navigate the Galaxy
Super Converter	U	MC	CUI	S/K/A Basic converter
Super Dissasem	U	MC	100	Zen compat dissassembler
Super Simon	G	F	100	
Telephone List	U	S	CUI	list sorter/printer
Text Editor	WP	MC	CUI	Reasonable WP

# Sharp Users Club - MZ-700 Section - Library Special /Spares

Times Tables	G	S	CG1	Good for Kids
Treasure House	A	S	LM1	
Up the Pole	G	MC	CG1	Ladders/Poles/Monsters
Up Up and Away	G	MC	CG1	Kong style game
Valley	A	S	AD1	Original club game
White Barrows	A	S	LM1	Hierarchy of chambers
Witches Fortress	A	S	LM1	
Wizzards Castle	A	5025	CG2	Classic game
Worms	G	S	CG1	Number-eating worm.
Z80 Machine	U	MC	CU1	Disassembler
HU-Basic.700/S+/M L		MC	---	2 versions (see p.54)
Sharp Pencil.700 WP		MC		See p.55

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## AVAILABILITY OF SHARP SPARES AND HARDWARE by Maurice Hawes

Ching Rashbrooke, a member of the S.U.C. who works in the Middle East, came home to the U.K. in September 1987 for a few weeks' leave. Ching has an MZ-700 with the K&P disc system, and an MZ-800 with Sharp Quickdisc. Whilst he was here, Ching was hoping to obtain an MZ-800 interface card for his 5.25" double discs, plus the MZ-800 Sharp and PCP/M operating software.

During October Ching rang Sharpsoft in London, who referred him to Sharp U.K. in Manchester; neither firm could help immediately because the employees in question were away. On October 26th Ching visited me in Bridgnorth, and we decided to make a few 'phone calls. We started with Sharp U.K., and were told that the items were available but only through a retailer, and they could not tell us what the prices should be (!). Kuma have never handled the MZ-800. Knight's of Aberdeen have gone out of Sharp computers. P.C.S. in Denton sounded hopeful but in the end they could not help. Solo Software in Worcester were most helpful; they told us that MZ parts were no longer available in the U.K., but they could obtain them from Germany and would get us a quotation by Telex.

This did not altogether surprise Ching, who bought his MZ-800 from a dealer in Holland, and had already obtained the addresses of three Sharp Dealers in Germany. In the light of our lack of success with U.K. Dealers, we therefore thought that it might be useful to list the Dutch and German addresses here. They are:-

LICOMP  
TEMPELIERSTRAAT 2B (MARKT)  
POSTBUS 89  
6850 AB HUISSSEN  
NEDERLAND

HUNISCH DATEN-TECHNIK  
4100 DUISBURG 25  
WARTBURGSTRASSE 1  
WEST GERMANY

KRAMER & KRULL GmbH  
4330 MULHEIM/RUHR  
KASSENBERG 32  
WEST GERMANY

KERSTEN & PARTNER  
D5100 AACHEN  
WILDBACHERMUEHLE 83  
WEST GERMANY

Ching is continuing his enquiries and will keep us informed. For a progress report, contact me (Maurice Hawes) \*\*\*

## HU-BASIC ON THE MZ-700

By Eric Stanley and Maurice Hawes

*In July 1987 Eric Stanley wrote to say that he had been unable to get HU-BASIC working correctly on his MZ-700, using the modifications printed in Vol.5 No.1 pp.63-64. A long correspondence ensued, resulting in a corrected and improved version of HU-BASIC for the MZ-700.*

The previously published sets of modifications for getting HU-BASIC to work on the MZ-700 (Vol.5 No.1 pp.63-64 and Software Manual 1 p.53) are at variance, and neither is entirely satisfactory. The changes in Vol.5 No.1 contain some errors, and the changes in Software Manual 1, though correct as far as they go, are inadequate. For the record, the changes published in Vol.5 No.1 on page 63 should be corrected as underlined below:-

At 12D2 enter CD 32 0A CA A0 14 DA B6 14 00 00 00 00 00  
(Swap bytes 12D3-4, changes END at 12E0)

At 4731 enter DB 61  
At 4FEF NO\_CHANGE\_REQUIRED  
At 4FF5 NO\_CHANGE\_REQUIRED  
At 4A94 enter EF 61

At 61DE the code should be 00, not 0B

The remainder of the changes on pp.63-64 are correct, and with the above alterations included the interpreter is usable. However, the defined keys appear all over the KBD in different modes, there is no graphics cursor, and some BREAK keys do not work as they should. Also, the compressed error messages are far from ideal.

After lengthy correspondence and several attempts, we produced a version of HU-BASIC which works in a more satisfactory way. When the defined keys are switched on they appear on the 10 numeric keys, in GRAPH mode only. The GRAPH key produces a "four square" cursor, and CR returns the keyboard to ALPHA mode. Most of the BREAK key combinations work as documented for the MZ-80K, and those which do not have been disabled. The exceptions are BREAK/Y and BREAK/Z, which give ALPHA and GRAPH; and BREAK/B, which converts all preceding small characters to capitals. As HU-BASIC uses the MZ-700 Monitor-in-ROM, there is no way of locking into the alternative keyboard, and it is necessary to hold down a SHIFT key to get lower-case, or alternative graphics.

We then decided to add some some improvements, including a "VERIFY" command, and the messages "Verifying", "Merging", and "READING". In order to make room for "VERIFY" in the keyword table, we changed "CONSOLE" to "SLOT", and "SEARCH" to "FIND". We also rewrote the error-message table to make the individual messages more readable.

There are now two versions of HU-BASIC.700 in the MZ-700 Library. The /S version has a Sharp printer routine; the /M version has a printer patch to produce standard lower-case ASCII codes, and "." for SHARP graphics codes. \*\*\*\*

## SHARP PENCIL ON THE MZ-700

By Maurice Hawes

SHARP PENCIL, written by member Barrie Frost, is a very compact and easy-to use tape-based word-processing programme written for the MZ-80K. Apart from the fact that it overcomes the 40-column screen problem in a novel and very user-friendly way, it contains a surprising number of features for such a small package, and is very useful for writing short documents. I therefore decided to find out whether the programme could be made to run on the MZ-700.

In my first tests I discovered that the MZ-80K version of SHARP PENCIL will run on the MZ-700 without crashing, and can in fact be used, after a fashion, as it stands. At the start of each EDIT line the keyboard is automatically put into MZ-700 graphics mode, and the keys produce a scrambled combination of graphics, and letters in the wrong places; however, the ALPHA key returns the keyboard to normal, and it may then be used to enter text. But key-repeat routine is excruciatingly slow (so slow that at first I thought it wasn't working at all!), and the only way to get lower-case letters is to hold down a SHIFT key. In addition, when loading a text file, the "FOUND" and "LOADING" messages appear as gibberish, because of incompatibilities between the MZ-80K and MZ-700 Monitors. In short, I concluded that SHARP PENCIL does need to be modified for satisfactory operation on the MZ-700.

I located the key-repeat code and reduced the delays to make them acceptable. I then examined the table which redefines the MZ-80K keyboard; it was too small to re-define the MZ-700 keyboard twice over, so I rewrote it in spare space (MZ-80K SHARP PENCIL runs from 1200H to 281EH, but the text buffer does not start until 2A00H). The new table redefines the "normal" keyboard as upper-case, and the "graphics" keyboard as lower-case; the ALPHA key acts as a toggle to switch between the two modes, and lower-case is indicated by the "FOUR SQUARES" cursor. In the TEXT mode, the keyboard is put in lower-case, and the ALPHA key acts as a CAPS LOCK key. Finally, I added internal messages for "FILENAME" and "LOADING", and disabled the GRAPH key.

When I came to test the programme on my MZ-700/plotter-printer set-up, I was surprised to find that the characters ">" and "!" were interchanged by the printer. Investigation showed that this stems from the MZ-700 Monitor-in-ROM; the ">" key produces C0H, and the "!" key produces 80H, which is the opposite of what is stated in the "ASCII" table in my MZ-700 handbook. This "bug" is written out by the screen software, so that the keys produce the right characters on the screen, and PRINT CHR# works as documented. But the "bug" gets through normal Sharp printer software, so I added a patch to swap over the two characters.

The resultant programme, which I call "SHARP PENCIL.700", operates in exactly the same way as SHARP PENCIL on the MZ-80K (see Vol.6 No.1 pp.28-30), except for the keyboard, which works as described above. "SHARP PENCIL.700" runs from 1200H to 29B6H, executes at 1200H, and warm starts at 12C7H; the text-buffer starts at 2A00H. It is now in the MZ-700 Library. \*\*\*\*\*

MORE PROBLEMS THAN SOLUTIONS!

By John Edwards and Maurice Hawes



During the last four months our main concern has been the blowing of Eproms. We started off successfully by blowing two different MZ-700 FD eproms, one for the K&P disc system, and the other for the SHARP disc system. Either chip fits the MZ-80A FD card connected to the MZ-700 as described in the last issue, and by swapping them over we were able to boot up either K&P DISC BASIC V1.04KP, or SHARP DISC BASIC 22-009E.

Things then started to go wrong, when John's Eprom-blower (recently bought from another member) became unreliable. We were helped by a local electronics engineer, who lent us a commercial eprom-blowing machine for a few days. Armed with this, we blew a composite K&P/SHARP FD eprom, with address line A10 brought out to a switch, to set it to 0V or 5V. The system worked first time; with the switch in one position, we could boot a K&P system disc; and with the switch in the other position, we could boot a SHARP system disc. We went out to celebrate.

When we returned an hour later the system had locked up, and the only way we could get it going again was to replace the composite eprom with one of the two separate eproms, both of which still worked satisfactorily. Eventually John hit on the idea of applying a freezing spray to the composite eprom - and lo and behold, this worked. As we go to print, we are inclined to think that the eprom in question is too slow, not noticeable when cold, but causing problems as it warms up. We have bought some faster eproms, and shall borrow the eprom-blower and try again a.s.a.p.

We also got involved with trying to help "Seth", who had bought a P6 printer very cheaply, with an "A" character eprom, and wanted to change it to a "B". There are three different character-eproms available for P5/P6 printers, for the "K", the "A" and the "B", and we managed to obtain an original of each. We then blew a copy of the "B" character eprom on a 2716, verified it, and sent it to "Seth". To our great surprise, it did not work. Speed problems again, perhaps? Maurice finished up by buying the printer from "Seth", so at least we now have the machine available for experiments. Can anyone give us any clues on this one?

Finally, our last unsolved problem concerns the Kuma 80-column modification for the MZ-80A. We have received written permission from Kuma and Dr Gladman, to market this upgrade, as a Club project, at our own price. It involves replacing the MZ-80A Monitor EPROM, changing the crystal, and making some modifications to the main computer circuit board. We have a copy of the Monitor EPROM, and we know what crystal is needed, but we do not have full details of the hardware modifications. Again, if anyone can help, please let us know.

Suggestions regarding any of the above problems may be sent direct to Maurice Hawes at:-

18, Salop Street, Bridgnorth, Shropshire WV16 4QU  
Telephone Bridgnorth (07462) 3254



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Sharp Users Club 1987