SHARP USERS CLUB

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SHARP USERS CLUB MAGAZINE

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5th November 1990

As I write, employees of Weymouth and Portland Borough Council (sorry, Weyport Services, they're privatised) are making a bonfire on the beach, ready for tonight's Guy Fawkes party. I am reminded that it is nearly the end of 1990, and lots of new members who have joined very recently will be expected to pay again very soon. This is something which I feel deserves an explanation.

When we took over from Yeovil, we inherited a system whereby a member paid for a one year on joining, and was not expected to pay again for 12 months. This sounds fair, but it is hard to run, and it leads to arguments about who gets which Magazines. So at the start of 1987 we changed the system; now, every subscription is considered to be for the current calendar year, and entitles the payer to ALL THE MAGAZINES FOR THAT YEAR. When a subscription is received, we send out any current Magazines already published, and others follow as published. You all get 3 Magazines for 1 payment.

In an extreme case, it may seem unfair; for example, someone who joins (or re-joins) on December 31st will be expected to pay again the following day, January 1st. But such a member will immediately get all the Magazines for one year, and later on he will get all the Magazines for the next year. I hope you see our point!

My ulterior motive now becomes obvious. At the centre of this Magazine there is a coloured subscription renewal form for 1991,

PULL OUT THE SUBSCRIPTION RENEWAL FORM, AND SEND IT TO JOHN DUXBURY WITH YOUR 1991 SUBSCRIPTION, NOW!!

As an incentive, a free 'INDEX' to Volumes 9 & 10 will be sent, early in February '91, to all those who have paid by January 31st. Those who pay later will receive the 'INDEX' when they pay.

A large part of this issue is taken up with reviews or updates on items of Club Software which have been around for many years and are perhaps taken for granted by our longer-standing members. When you consider the large number of new members enrolled during the last two years, it is clear that many of us may never have savoured the delights of 'SUPERTAPE', 'PROBE', 'Z80 MACHINE' or 'DISKEDIT'. Many of the articles in the 'general' section are meant to rectify this, and at the same time tidy up the situation for everyone, by collating material from out-of-print issues.

I have to admit that most of the programs referred to do not run on the MZ-80B; but John Ibberson has produced a couple of rabbits out of his hat, and if other consolation is needed, the MZ-80B is the only Sharp MZ-80 computer which doesn't need hardware mods. to run 80 columns and CP/M. So I hope the inbalance will be forgiven (if you want to treat yourself to an MZ-80B for Xmas, see page 5).

Meanwhile, we soldier on - Rupert Steele finds our success worth frequent mention, but do remember that we need YOUR contributions, above all, to keep the Club alive and kicking. Bon Chance in 1991!

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***** ITEMS AVAILABLE FROM WEYMOUTH *****

As we go to press there are very few back issues available, and those we do have are running out fast. Therefore, to order back issues, please contact the Chief Editor to find out what is left.

Ex-Kuma K/A/700 books at £1-00 each, or £2-00 for any 3, post free, as listed in Vol.10 No.1 at TOP of p.3. Also available, other books lower down same page. Last of all but not least, the NEW Software Manual III £2-00 (see overleaf & NEWCOMERS SECTION).

A few Sharpsoft back issues available; ask for details. Also "B" FDOS Compiler £5;"K" D.P.Disk Basic £9; MZ-700/P3 printer lead £3.

THE INCREDIBLE SOFTWARE MANUAL III
or 'Sharp MZ-80K/B/A/700/800 computers and their Basics'

This publication changed its shape as it was being produced and ended up as the complete guide to MZ-80K/B/A/700/800 computers and their Basics. We think that no home can afford to be without one (£2-00 post free from Weymouth), but please judge for yourself:-

SECTION A - SHARP COMPUTERS

SECTION B - SHARP MZ BASICS 1980-84

SECTION C - MODIFIED BASICS, TOOLKITS, OTHER BASICS

APPENDIX A - CHARACTER CODES & BANK-SWITCHING

APPENDIX B - SHARP BASIC ODDITIES

***** PRIVATE SALES *****

** T.Williamson, The Bungalow, The Camp Site, Bridge Rd, Chertsey, Surrey KT16 8JX (0932 562405) has 2 Sharp computers for sale:-
1) MZ-80B with dual disks and P4 wide carriage printer, all Manuals, disks, tapes etc. and several books.....£275
2) MZ-80A with Manual and tapes.....£50

** S.Smith, 28 Alexandra Rd, Epsom, Surrey KT17 4BT (0372 723652) MZ-5600, 256K RAM, dual disks, colour VDU, MS-DOS, CP/M-86 with Sharp Basic, all Manuals...£395 (will deliver locally).

** Mrs J Sprunt, 33 Severn Rd, Culcheth, Warrington WA3 5ED (0925 763026) has an MZ-80B with dual disks, P5 printer, CP/M, WDPRO, plus a SECOND printer I/F card (Petersons v3.2).....£200 o.n.o.

** B. Gibbs, 62 Lawes Avenue, Newhaven, E.Sussex (0273 514465) MZ-80A, dual disks, P6 printer, Manuals, CP/M, WDPRO etc..£225

** G.Chapman (address etc. at head of MZ-80A section) MZ-700 with built-in tape deck, original tapes & Manuals...£40

** Paul Godwin, Tel. 0902 354432 (Wolverhampton) MZ-80K with Manual, Basic and Applications tapes....£45

** Steve Root, (0252 878 209) (Farnborough) MZ-80A with Manual, Knight's Fortran, Peeking & Poking ...£50

** R.Wymark, 5 Berrymound View, Hollywood, Birmingham B47 5QF (021 430-4466) has an MZ-80B with 2x8K Graphics RAM, dual disk drives, P5 printer, tape & disk Basics, FDOS, CP/M (with MACRO-80 Assembler, two different C Compilers, Prospero Pascal, PD disks from CPMUKUG), 2 GP I/O cards, Magazines, all Manuals. As the disk drives need some loving care and attention (solely due to lack of recent use) will accept £200 for the lot.....

** Dave Burk, 17 Barnard Close, Duston, Northampton NN5 6LB (0604 75283) has a P5 printer for sale, with 'B' ROM £50

** Christian Lampard, 5 Meadow Close, Tarvin, Chester CH3 8LY (0829 40446) has an MZ-80K I/O Box with disk and printer cards, MZ-80FDK twin disk drives, 6015 Manual & Master disk...£120 ono

** S.Dunlop (0243 670354)(Chichester) has an Olivetti ET-210 daisy wheel typewriter/printer with a built-in RS232 interface and 4 different daisywheels. At 40 chr/sec it's a bit slow, but the typewriter keyboard is one of the nicest ever made....£200 ono.

** The Editor is having a clear-out (0305 783518):-
MZ-80K I/O box with disk card, modified printer card....£45
MZ-80K I/O box with disk card, XTAL serial I/O card.....£40
MZ-80A I/O box with disk card, printer card.....£55
MZ-80A/B printer card in original box.....£12
MZ-80K Universal I/O2 card in original box.....£10

At these prices I think buyer should collect (or pay carriage)!

Letters to the Editor

The longest-serving MZ-80K (?)

From a recommendation by Mr. Harry Foster-Holt, I am writing to you with the objective of joining the Sharp User Group.

For your information, I am a Sharp MZ-80K user since almost its first day of availability in the UK and, whilst I now have two or three other computers which I use for my Business, I still use the MZ-80K regularly, for business purposes (I upgraded it to 48K and, later, added two disk drives and an Epson MX80 F/TIII printer).

It runs a complete suite of 'Distribution Analysis' programs which I originally developed and have added to over the years. It has now become a very sophisticated suite, and represents the backbone for my distribution consultancy work.

Initially, I joined Knight's and the S.U.N. groups, and collected all their issues; I loaned many of these to other people, and most of them, unfortunately, have disappeared, "never to be replaced". You can imagine my distress.

I enclose a cheque for £6 membership fee, and I look forward to receiving information about the User Group, and details of the software that you are able to offer.

Brian W. Smith, Littlehampton

(How satisfying to find an MZ-80K still in serious use after 10 years! A typical map produced by Mr. Smith's program appears on the opposite page - ED.)

****

MZ-700/P3 printer lead finds another niche!

Remember that printer lead that you sent me (an MZ-700/P3 printer lead- ED.) well, I thought I would tell you the story about it. I have a Tandy portable computer which I use with a Panasonic printer. The Tandy lead that I use to connect them together has a standard 'Centronics' connector at the printer end, and a female 26-hole plug at the computer end. When I received the lead from you I couldn't believe my eyes because the new lead plugged straight onto my old lead and it was then just a matter of working out which wires were not required. I soon sorted them out and they were 10, 12, 25, and 26. And now my MZ-700 runs my Panasonic printer, and when I need the printer on my Tandy I simply unplug the connectors joining the two leads together, and plug the Panasonic into the Tandy using its original lead.

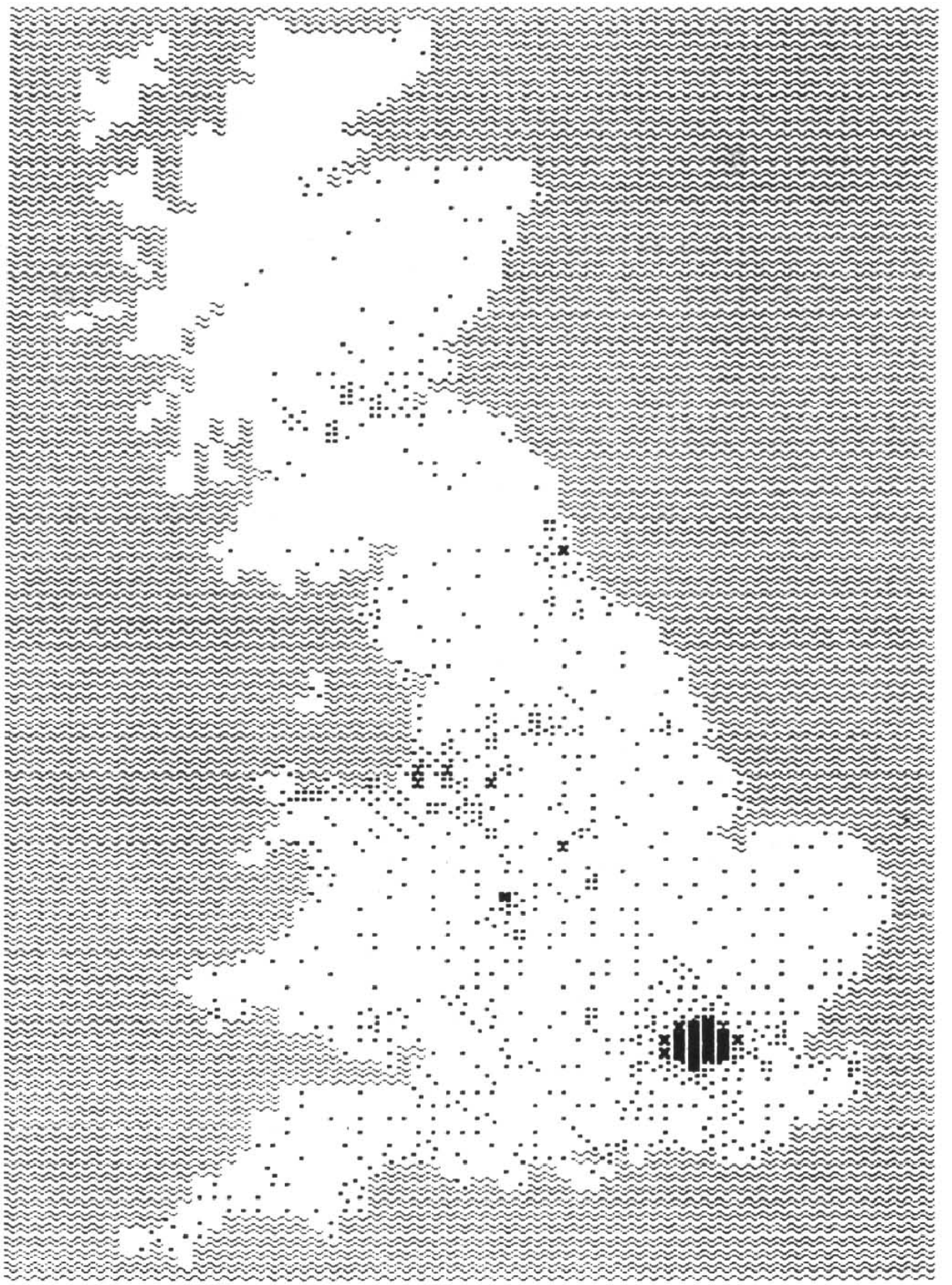
One other thing - the MZ-700 'Centronics' software works O.K.

D. Roberts, Farnham, Surrey

(I still have a few MZ-700/P3 printer leads left, at £3-00 each post free - ED.)

DISTRIBUTION S ystems
M anagement
I nventory
T ransport
H andling
S torage

Example of IRON



SPARES AND SERVICE MANUALS FOR SHARP COMPUTERS

REPLACEMENT MASTER TAPES

Sharp Electronics U.K. Ltd. offer a replacement service for Basic Master tapes. Just send a good quality C30 or C60 tape to Sharp Electronics (U.K.) Ltd., Sharp House, Thorp Road, Newton Heath, Manchester M10 9BE. Be sure to tell them WHICH MACHINE you require Basic for, and mark your envelope 'SOFTWARE DEPARTMENT'. Please note, THIS OFFER DOES NOT APPLY TO DISK BASICS!

M&B BARGAIN CENTRE 12 Boundary Road, Hove, BN3 4EH (0273 430380)

Nikky tells us that they still have the following:-

a)	MZ-1F11 Quickdisk Drive Units	now only	£10-00
b)	MZ-1U06 MZ-700 Expansion Box	now only	£10-00
c)	MZ-1T04 MZ-800 Tape Decks		£ 9-00
d)	MZ-1P16 MZ-800 Plotters are now £16-00 but still		£15-00
e)	MZ-1E19 QDisk I/F card + 2 Master disks		£15-00

all plus carriage to SUC!

All the above may be used with the MZ-700; the first 3 items may be used as they come; the p/p needs a different +5V connector; and the QD I/F card plugs into the Expansion box but requires EITHER a special tape version of 700 QDBASIC, or a special SUC Monitor ROM.

The stock of plotter/printers is getting VERY low (they can be used on other computers). And anyone who doesn't buy an Expansion box for £10-00 should be certified (as excessively short-sighted).

COMPUTER 100 85/87 Basingstoke Rd Reading RG2 0HA (0734 753100)

Have asked us to explain that, although they are happy to help SUC Members with Sharp spares, they are NOT a retail organisation, and our requests must frequently take a back seat in favour of the day-to-day needs of their regular, contracted customers.

Computer 100 have adequate stocks of MZ-80K and MZ-80A Expansion Boxes complete with printer and disk cards, at reasonable prices. As these require little maintenance apart from cleaning, they can usually be supplied 'off the shelf'; please contact Dave Cleeton.

The situation with disk drives is different. These will have been returned from customers after long use, and in all cases they will need overhauling and checking before they can be sold. This can can only be done at times when staff have no other jobs to do.

So please be patient, and please make your telephone calls short and to the point! If you wish to collect items personally, the best time to do this is on a Saturday, preferably in the morning, but please ONLY BY PRIOR ARRANGEMENT with the 'boss', John McRae.

SERVICE MANUALS

A full page (opposite) is devoted to a catalogue of the Sharp Computer Manuals which are still available from Teega Agencies. We recommend that you obtain a SERVICE MANUAL for your computer if you do not have one already - they are all available at around £11 each, and are amazingly good sources of technical information.

Good news from Teega Agencies

Thanks to Sharp U.K. we now know which Manuals are obtainable from Teega Agencies, Martin Street, Burnley, Lancs. BB10 1SH (Tel. 0282 38072). Even better, they have sent us a complimentary copy of every document they can supply, and the list is as follows:-

Computers

MZ-80K: Service Manual
MZ-80B: Owner's Manual, Basic Manual, Service Manual
MZ-80A: Service Manual
MZ-700: Owner's Manual, QDBasic Manual, Service Manual (see *)
MZ-800: QDBasic Manual, Service Manual (see **)
MZ-3500: Owners Manual, Basic Manual, Basic Appendix
MZ-3500: Checker Manual, Service Manual (revised edition)
MZ-5600: Service Manual, Checker Manual
MZ-5600A: Service Manual, Diagnostic Manual

* The 700 Service Manual includes tape deck and p/printer
** The 800 Service Manual includes tape deck, p/printer, joysticks

I/O Boxes

MZ-80A (I/O Box + Disk card): Service Manual
MZ-700 I/O Box: Service Manual

5.25" Disk Drives

MZ-80FB/FBK Dual disk drive: Instruction Book
MZ-80SFD Single disk drive: Instruction Book, Service Manual
MZ-1F02 Dual MZ-3500 disk drives: Service Manual
MZ-1F16 Dual MZ-5600 disk drives: Service Manual
MZ-1F19 Single MZ-800 disk drive: Instruction Book

Printers

Instruction books: P3 and P6 printers
Service Manuals: P3, P4, P5 and P6 printers, and P5 Supplement

Miscellaneous Interface Cards

MZ-80B GP-IB I/F card: User's (Technical) Manual
MZ-80B RS-232 and GP-IB cards: Service Manual
MZ-80B MZ-80GM Graphic RAM card: Circuit Diagram and Parts leaflet
MZ-800 MZ-1R18 RAM File card: Instruction Booklet
MZ-1E24 RS-232 card (works on MZ-80B/700/800!): Operation Manual
MZ-3500 MZ-1E01 RS-232C card: Service Manual

Video Display Units

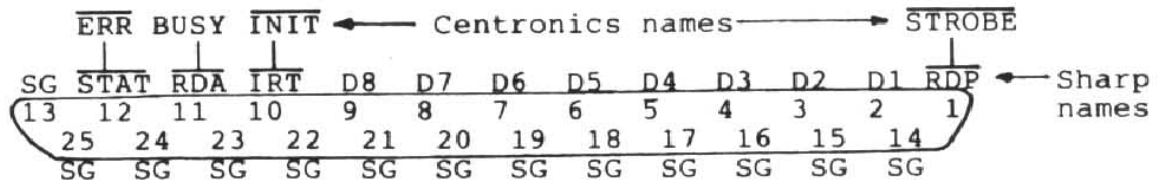
MZ-1D05 color display (MZ-700): Service Manual
MZ-1D07 green display (MZ-3500): Service Manual
MZ-1D18 color display (MZ-5600): Installation booklet

A mixed bag, with useful items for the MZ-80B and MZ-3500, and Service Manuals for all our computers and for 'P' series printers. If you haven't got a Service Manual for your computer or your 'P' printer, get one soon, before they disappear - ED.

Sharp to 'Centronics' printer leads

By Maurice Hawes and John Edwards

A query from Terry Leary has made us realise that our article in Volume 10 No.1 (on page 8) applies only to the MZ-80A and the MZ-80B, which both use a printer card with a 25-way 'D'-type output socket. After carrying out our hardware modifications to provide the correct polarity RDP and IRT signals, the signals on this type of connector, viewed end-on, are laid out as follows:



From the above diagram, it is clear that all the signal pins are in the top row, and the bottom row is all 'Signal Grounds'. Also note that there is NO 'Frame Ground' (i.e. chassis 'Earth'). The data given in Vol.10 No.1, to connect the above to a 'Centronics' printer, are O.K., but we meant to suggest that you should ignore Sharp pin 13, which is a superfluous Signal Ground:-

Sharp pins 1-9 to Centronics pins 1-9 (STROBE + DATA 1-8)
Sharp pin 11 to Centronics pin 11 (BUSY)
Sharp pin 10 to Centronics pin 31 (if INIT needed here)
Sharp pin 12 to Centronics pin 32 (optional ERROR signal)
Sharp pin 13 NO CONNECTION NECESSARY (extra Signal Ground)
Sharp pins 14-25 to Centronics pins 19-30 (Signal Grounds)

****

The 26-way dual in-line connector on the MZ-80K printer card, and the printer edge-connector on the MZ-700 PCB, are of different types, but the signals on them are laid out in the same order:-

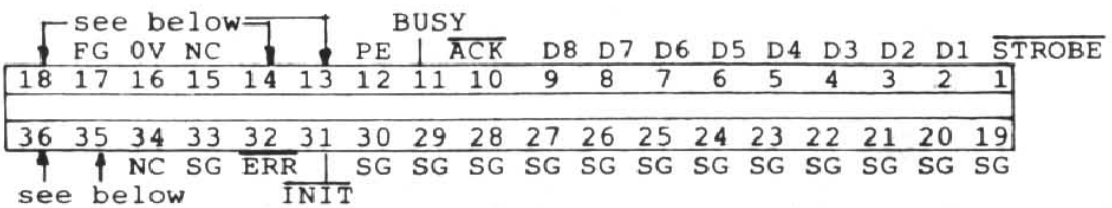
	ERR	BUSY	INIT	← Centronics names →							STROBE
FG	STAT	RDA	IRT	D8	D7	D6	D5	D4	D3	D2	D1	RDP
25	23	21	19	17	15	13	11	9	7	5	3	1
26	24	22	20	18	16	14	12	10	8	6	4	2
FG	SG	SG	SG	SG	SG	SG	SG	SG	SG	SG	SG	SG

Once again, the signal pins are in the top row, and the bottom row pins (except pin 26) are all SG. The pin numbers are different from those used on the MZ-80A/B D-type connector, BUT THE PHYSICAL LAYOUT OF THE IMPORTANT SIGNAL PINS IS THE SAME. The only change is that pins 25 and 26 in the MZ-80K/700 connectors are connected to FG (Frame ground); if these are not connected, the correct 'Centronics' connections, including the two 'optionals', are:-

Sharp pins 1,3,5,7,9,11,13,15,17 to Cent. pins 1-9
Sharp pin 21 to Cent. pin 11 (BUSY)
Sharp pin 19 (if needed) to Cent. pin 31 (INIT)
Sharp pin 23 (optional) to Cent. pin 32 (ERROR)
Sharp pins 25,26 NO CONNECTION
Sharp pins even numbers 2-24 to Cent. 19-30 (S.G)

The above looks a bit complicated, but if you use RIBBON cable and IDC connectors, A SUITABLE CABLE MAY BE MADE UP IN THE SAME WAY for all machines, as we shall now attempt to explain.

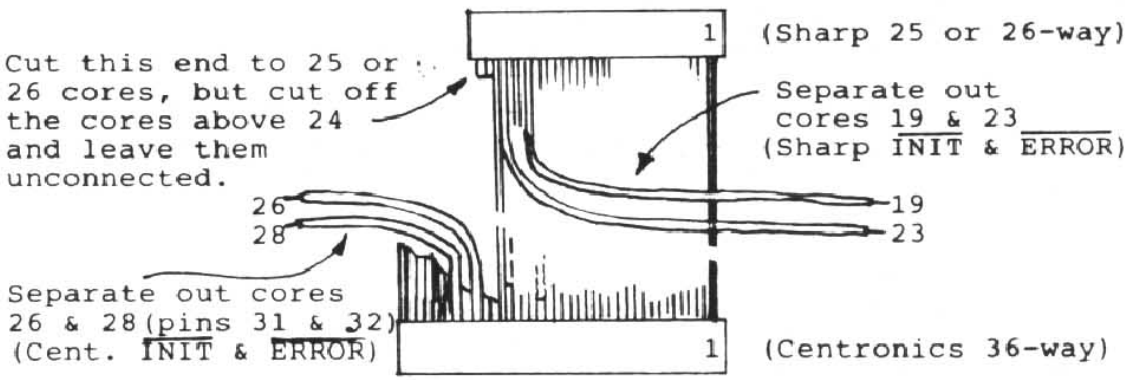
The connections on a STANDARD 'Centronics' 36-way connector (i.e. on an EPSON FX-80) are as follows:-



Compare the above with the diagrams for the Sharp connectors. The rightmost 24 connectors (1-12 and 19-30) correspond almost exactly with pins 1-24 on all types of Sharp connector! The only differences are the INIT and ERROR signals; these appear on Sharp pins in the top row, but on Centronics pins 31/32 in the bottom row. These signals are not always essential; some Centronics printers require +5V on pin 31 to keep them 'selected', others do not; and the signal on pin 32, which is an error signal to the host computer, means different things on different printers!

In practice, it is sensible to leave the many of the 12 pins on the left-hand side of the above diagram disconnected anyway; pins 15 and 34 are rarely used at all; 13 and 35 are pulled up to 5V through a resistor, and on many printers pin 18 is 'live', being connected directly to +5V. However, some systems do use pin 14, which has to be pulled down to 0V if you want AUTO LF, and pin 36 has to be put at +5V to enable software SELECT via codes DC1 and DC3. Neither of these features is likely to be needed very often.

In short, if you make up a 36-way ribbon cable as shown below, it should enable you to run any 'Centronics' printer on your Sharp computer; you may or may not need to make the 'flying' connections (19 Sharp to 26 Centronics, 23 Sharp to 28 Centronics):-



If your printer has to be held 'selected', connect Sharp core 19 to Centronics core 26. And if you wish, you may experiment with error signals by connecting Sharp core 23 to Centronics core 28.

And that, as they say, is that (we hope!). Except to add that, if you prefer to use solder-tag connectors and a multi-core cable, there is no need to connect 12 signal grounds. One will do! *****

ALTERNATIVE DISK DRIVES FOR SHARP MZ COMPUTERS

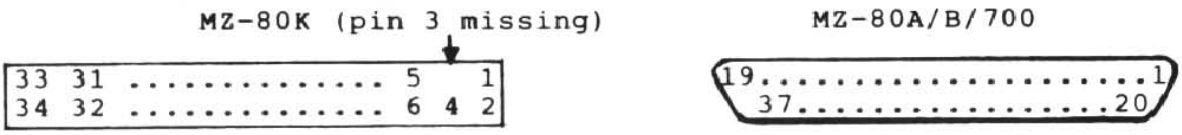
** This is an update of the article written by C. Handley in 1985. His references to switchable 40/80-track drives have been deleted, as we now know that these are a menace, see Vol.9 No.3 p.11. **

Any Shugart-compatible double-sided 40-track drives may be used. The disk card should be a standard Sharp card; the MZ-80A card may be used on the MZ-700, provided that the F.D. boot eprom (the 2716 nearest to the edge connector) is changed to suit the 700.

Shugart drives normally use a 34-way dual in-line connector; the MZ-80K disk I/F card uses the same connector, but the later Sharp disk I/F cards use a 37-way 'D' connector. The tie-up is:-

SHUGART PIN(S)	SIGNAL	MZ-80K PIN(S)	MZ-80A/B/700 PIN(S)	
All odd (1-33)	S.G	All odd (1-33)	20-36	
2	N.C	2	1	
4	N.C	4	2	
6	Drive 3	6	3	
8	Index	8	4	
10	Drive 0	10	5	N.C = No
12	Drive 1	12	6	Connection
14	Drive 2	14	7	
16	Motor on	16	8	
18	Direction select	18	9	S.G =
20	Step	20	10	Signal
22	Write data	22	11	Ground
24	Write gate	24	12	
26	Track 0	26	13	
28	Write protect	28	14	
30	Read data	30	15	
32	Side 1 select	32	16	
34	Ready	-	-	
	N.C	34	17-19, 37	

From the above, it is clear that the Sharp system is the same as the Shugart system, except that it does not use the READY signal. If your Shugart drives have a plain-coloured built-in ribbon lead, the marked wire should be taken as PIN 1. The layout on the Sharp I/F card external connectors is as follows:-



All Sharp MZ- disk software uses only 35 tracks per side. The unused 5 tracks are at the centre of the disks, and on most Sharp drives a mechanical stop prevents the heads from reaching them. If you use full 40-track drives, it is possible to rewrite your disk software to use 40 tracks. But this is not recommended as it makes your disks non-standard as far as other Sharp users are concerned.

Drive head selection is governed by a link on the internal PCB. This link is normally set to HS, but may be moved to HM. In HS a head is lowered into the read/write position only when its drive is selected. In HM all heads are lowered whenever the motor is switched on; this is less noisy when copying files between drives, but over a long period it causes more wear on heads and disks. ***

COPYING MASTER DISKS - UPDATE by J.Edwards and M.Hawes

In 1988 (Vol.8 No.2) we showed how to disk-edit a Basic master disk for SP-6015, SA-6510, SB-6510 or MZ-700 K&P DBasic, so that its disk-copying utility will copy a master disk without changing it. Since then we have found several more versions of MZ-700 K&P DBasic, and new MZ-80B disk Basics SB-6511 and SB-6510.5E. We have also sorted out the copying programs with SP-6115 and SB-6610.

We now use 'DISKEDIT' v.4, which runs on the MZ-80K/A/700. 'B' disks may be disk-edited on the 'A' (the formats are the same); or you can use Sharpsoft's 'B UTILITIES' on the 'B' itself. In the case of SP-6015, don't be afraid to disk-edit your precious Master disk (we can always rewrite the disk for you). The changes are:-

MASTER BASIC	PROGRAM START(TR/SC)	ADDRESS(ES) TO CHANGE(TR/SC/BYTE)	CHANGE FROM	CHANGE TO	PROGRAM NAME
SP-6015	3000H(16/11)	30C0H(16/12/42H)	77H	00H	(DISKETTE
(2 bytes	to change)	30CBH(16/12/4DH)	77H	00H	(COPY
SP-6115	1200H(16/13)	12AEH(16/14/2EH)	28H	18H	" "
SA-6510	12A0H(20/07)	1455H(20/08/B5H)	20H	18H	UTILITY
SB-6510	1220H(20/08)	13E3H(20/09/C3H)	20H	18H	UTILITY
SB-6510.5E	1220H(11/01)	13E3H(11/02/C3H)	20H	18H	UTILITY-SBM
SB-6610	1220H(11/01)	13E3H(11/02/C3H)	20H	18H	UTILITY
SB-6511	1220H(11/01)	13E5H(11/02/C5H)	20H	18H	UTILITY
K&P (A)	1200H(21/08)	13DAH(21/09/DAH)	00H	FFH	K&P UTILITY
K&P (B)	1200H(23/14)	13DAH(23/15/DAH)	00H	FFH	K&P UTILITY
sds 80-tr	1200H(?/?)	13FDH(?/?/?)	00H	FFH	FORMAT/B'KUP
sds 3.5"ss	1200H(10/04)	13FBH(10/05/FBH)	00H	FFH	FORMAT/B'KUP

N.B.1. If the location given does not contain one or other of the byte values shown DO NOT CHANGE IT (it shows that the disk is non-standard). We will be pleased to help in such cases.

N.B.2. TRACK/SECTOR information is in decimal values (as required by DISKEDIT). BYTE locations and BYTE settings are in HEX.

N.B.3. There are many DIFFERENT K&P Master disks in circulation. Version (A) is a 'Kuma' master and contains only 3 programs (FILING←CMT, UTILITY, and PLOTTERDEMO). Version (B) is very common in the U.K., but its origin is uncertain.

N.B.4. We have not seen an s.d.s. Master of MZ-700 DBasic on 5.25" 80-track disks, and cannot give track/sector information.

N.B.5. You should rename the revised program for identification; we suggest 'DISK COPY V2.0'/'UTILITY V2.0' or similar.

*** COPYING OTHER MASTER DISKS ***

On the MZ-80A, 'UTILITY V2.0' will copy an FDOS master disk. We are not sure that the equivalent ploy will work on other machines, but we think it will. On the MZ-700/800, the copying program which comes with Sharp's own disk and Quickdisk Basics, called 'FDCOPY', will copy any disk of the correct format, without changing it. ***

Transferring Sharp Basic programs to other Computers

By Maurice Hawes

Whilst working on Software Manual III, I discovered that the official Sharp MZ-700/800 disk Basics can save and load programs in ASCII format by using the switch 'A' after the filename e.g.

SAVE "CMT:FILENAME",A or LOAD"CMT:FILENAME",A

will save or load a program in ASCII source code, in BSD format i.e. in 256-byte blocks, on tape. The same thing can be done on disk by using the device descriptor "FDn:....", in which case each block occupies one linked sector in a continuous disk file.

So we can now transfer ANY Sharp Basic program, in ASCII format, onto almost any other machine, and I have already transferred a program which I wrote for the MZ-800 whilst I had it on loan from Sharp in 1986, to my newly-acquired Sharp MZ-5600. The method is:-

1) Load the program into Sharp MZ-700 or 800 disk Basic, having previously converted it if necessary into 700 tape format by using S-Basic (to load and convert 'K' programs on tape) or K&P DBasic (to load and convert 'A' and 'B' programs on disk).

2) Cut out any Sharp lower-case, by converting to upper-case (not necessary with programs of MZ-80B origin).

3) Save the program on 700/800 disk, in 256-byte BSD ASCII format.

4) Diskedit the directory entry to TYPE 1, the LOAD address to somewhere high in memory (e.g. $A000), the EXECUTE address to $0000, and the last two bytes of each sector (pointers) to 20H.

5) RUN the 'program' on the MZ-700 or MZ-800; it will load at e.g. $A000 and exit to the Monitor.

6) SAVE the 'program' on tape as one block with the Monitor 'S' command (having used the 'D' command to find out its limits).

7) Transfer the program to a Sharp CP/M disk , using 'CMT.COM'.

8) Use a disk-transfer utility to put the file on a disk for the target machine.

Once the ASCII file is on a disk for the target machine, it may be edited on your favourite word-processor and then loaded into Basic on that machine, as an ASCII source file, and finely tuned.

The 'difficult' step is step 8, which requires a disk-transfer utility to move the ASCII source file from a Sharp-CP/M disk to a disk formatted for the target machine.

I have a program called 'UNIFORM.COM', on my Epson QX-10, which can do just that for a very large selection of CP/M machines, for IBM CP/M-86 machines (e.g. Sharp MZ-5600), and for IBM MS-DOS formats. If anyone has an MZ-80K/A/B/700/800 Sharp Basic program which they would like to transfer to a different machine, I would be very happy to help; but I am limited to 5.25" formats! *****

MAURICE'S APRIL FOOL!

Greg Chapman

I trust everyone realised that Maurice's piece on using SUPERTAPE and B880 MASTER to make minor changes to machine code programs was just a little late for the April 1st edition of the Magazine. No, that's not quite fair! His method works, but it involves tricky calculations to find the right memory locations.

There is a far simpler way for all MZ-80K, MZ-80A and MZ-700 owners to make those simple changes to machine code programs. Use CLUB MON. It was written for just this task.

Maurice's problem is that his favourite program, Tanswell's DISASSEMBLER B880 (B800 on the MZ-80B), does not have a "Load File" command, so he had to find another way of loading a program and modifying it whilst keeping its file header details intact. His route was to choose a combination of Tanswell's DISASSEMBLER and SUPERTAPE; the one advantage of this method is that both programs are available on all our machines.

Admittedly, CLUB MON is not available to MZ-80B users. But the current versions of this program on all other machines offer all that you need for the task in hand, and it loads as fast as SUPERTAPE on its own.

The CLUB MON <R>ead command may be used to load any program which will not overwrite CLUB MON itself; as CLUB MON sits above CC00H, this is unlikely to be a problem. You may then use the <T>abulate or <P>rint commands to dump any area of memory to the screen or printer to check the code that you want to alter. As the program will have been loaded at its normal address, there is no need for complicated calculation of the offset, required by the SUPERTAPE method. You can then use the <M>odify command to change the bytes you want, checking the results with <T> or <P> again, if you wish. Finally use the <X> command to write the tape using the current tape header details. Nothing could be simpler! You can even <V>erify your tape if you feel the need.

CLUB MON has other commands too, to help in your task; a crude <S>earch command to find the byte in question; a <C>opy command, so you can duplicate the original code elsewhere in memory, in case you make mess up your changes and want to reinstate the original; and even a <W>rite command which allows you to change those header details if you want to. You could even test run the changes with the <G>oto command before you save the program.

I believe CLUB MON should be in all members personal libraries. The silly thing is that it was Maurice who provided the latest .A1 and .K3 versions. Both are available with either SHARP or a modified printer driver. While it is true that there is no official MZ-700 version, all the calls to ROM monitor routines do exist in the MZ-700 monitor, so either the .A or .K versions could be used on that machine. ***

(My article was serious, honest! I had forgotten CLUB MON - ED)

CLUB MON USERS MANUAL

CLUB MON is a simple machine-code monitor program. It loads directly from the Sharp monitor, residing at CC00H upwards and executing at CC00H. There are versions for the MZ-80K (.K3) and the MZ-80A (.A1), and both are available with either the original Sharp printer routines (/S), or a modified printer routine (/M) which produces correct ASCII lower case and "." for other codes above 5EH. Any version may be used on the MZ-700.

Once loaded a ">" prompt appears, and the following commands are then available:

G xxxx = Go to specified address.

M xxxx = Display memory byte for modification. <CR> to confirm changes/move on. <SHIFT/BREAK> to exit.

T xxxx yyyy = Tabulate on screen at 8 bytes per line in HEX and ASCII from xxxx to yyyy. (In the 'K3' version the second address may be omitted; if this is done, 128 bytes will be tabulated.)

P xxxx yyyy = As T but to printer at 16 bytes per line.

S xxxx yyyy zz = Search in area xxxx to yyyy for byte zz. Note: <CR> needed to confirm xxxx yyyy. The zz byte is then prompted with "B". If found, displays address and waits. Press any key to continue or <SHIFT/BREAK> to exit.

C xxxx yyyy zzzz = Copy memory block: xxxx = block start address
yyyy = copy start address
zzzz = length

R = Read next machine code file from tape. Name and file details appear on screen.

W xxxx yyyy zzzz filename

= Write file to tape: xxxx = execute address
yyyy = start address
zzzz = length
name = name of file

X = As W but uses the file parameters already in file header buffer at 10F0H to 1107H.

V = Verify next object file on tape with data in memory.

Notes:

1. The default address for all commands is 0001H.

2. The first four characters of all input strings which should be four digit HEX address are checked and rejected if not correct.

SUPERTAPE 2 USERS MANUAL

SUPERTAPE 2 is a tape copier. It can load up to 20 tape files into memory at locations of its own choice, and then save them to tape in any order. Each file must form a single continuous block i.e. SUPERTAPE will not copy a program protected by a separate machine-code loader; nor a BSD data file in 256-byte blocks. SUPERTAPE 2 was written for the MZ-80K but also works (with minor 'bugs') on the MZ-80A/700. In 1987, 'SUPERTAPE 2' was converted to run on the MZ-80B; SUPERTAPE 2B loads from SB-1510; 2BM loads from IPL and auto-runs; and 2BMJ loads from IPL but does NOT auto-run.

OPERATION:

Load the program from the Monitor (Monitor or IPL on the MZ-80B). The screen then displays the title of the program, followed by 'COPY>' and a flashing cursor. The following five commands are available (only the 'S' command requires confirmation with <CR>):

L LOAD (then press PLAY on K/A/700) looks for tape header, if found asks "LOAD (name) ?". Pressing 'Y' loads the program and returns to 'COPY>'; any other key aborts to 'COPY>'. N.B. Filesize is checked against free memory; if the file is too big you return to 'COPY>' with 'INSUFFICIENT MEMORY for (name)'.

S SAVE The cursor continues to flash, awaiting your selection of programs from those held in memory, either individually or as a group. Selection is confirmed with <CR> (or <ENT>) e.g.:-

```
S(CR)     to save all programs (the operation runs continuously)
S -5(CR)  to save all programs up to and including the 5th.
S 2-3(CR) to save programs 2 and 3.
S 4-(CR)  to save program 4 onwards
S 1(CR)   to save program 1 only.
```

Q QUERY This command displays a table of program details, in the order in which they are stored in memory:

PROGRAM	TYPE	SIZE	START	EXEC
name	x	xxxx	xxxx	xxxx
name	x	xxxx	xxxx	xxxx

I INITIALISE Clears ALL programs stored in SUPERTAPE's memory!

M MONITOR Exit to the Monitor (N.B. This is <CR> on the MZ-80B)

BUGS: The free memory calculation can be fooled, and allow a program to load into screen RAM; if you do a SHIFT/BREAK, programs previously loaded remain intact. Also, if you try to load more than 20 programs, their headers will overflow into the program store. On the A/700 only, 'Checksum error' causes a crash (its message address is meant for the 'K'). Finally, on the 'A' only, key-repeat is not always trapped and may go (harmlessly) wild!

ENTRY POINTS for SUPERTAPE 2 are:

```
Cold Start(K/A/700): 1200H  (MZ-80B): 1300H
Warm Start(K/A/700): 1213H  (MZ-80B): 1313H
```

CLUB COPY.U1 USERS MANUAL

INTRODUCTION

CLUB COPY.U1 is an improved version of SUPERTAPE 2. It can load up to 15 tape files into memory, at locations of its own choice, and can then save them to tape in any order. Each file must form a single continuous block i.e. CLUB COPY will not work with a program protected by a separate machine code loader, nor with a BSD data file, which is in 256-byte blocks. CLUB COPY.U1 works on the MZ-80K/A/700, but is NOT available for the MZ-80B.

LOADING AND INSTALLATION

Load the program from the ROM Monitor. Once loaded, the program executes an automatic installation routine. This checks a key byte (00BBH) in the ROM monitor of the machine into which it is being loaded, which enables the program to decide whether it is being loaded into an MZ-80A, MZ-80K or MZ-700. It will then adjust the bytes in the program which ensure that the correct "Loading" and "Check Sum Error" messages will be displayed when required. If the installation routine does not find the normal bytes expected on an the MZ-700 or the MZ-80A (it allows for the KUMA 80 column ROM), it assumes it is being loaded into an MZ-80K and instals the program accordingly.

OPERATING THE PROGRAM

After installation, the screen displays the program title and version at the top, a large central window for eventual details of files loaded, and a prompt/message window at the bottom. The bottom window shows:-

Options: Load, Save, Clear, Exit

All prompts for user input take this form; a key word or phrase followed by a colon, followed by commands, of which the initial letter should be pressed to take the desired action. Thus, at the start, there are four main options, described more fully on the following pages. There is NO flashing cursor, and confirmation with the <CR> key is not required. At any time, subject to the usual delays at times when the tape drive has been engaged, you can return to this menu by pressing <SHIFT/BREAK>. Other keys not indicated on the menus are disabled.

COLD AND WARM RESTARTS

If, for any reason, you return to the ROM Monitor of your machine, CLUB COPY.U1 may be restarted by a jump to its warm start address, which preserves all programs previously loaded into memory. Alternatively, a jump to its cold start address will restart the program as if you had just loaded it.

Entry points for CLUB COPY.U1 are:

Cold Start: 1200H
Warm Start: 1213H

THE 4 MAIN OPTIONS

<L>OAD: If there are already 15 programs loaded, this option is inoperative. Otherwise the message window shows "Searching.." (if no tape key is pressed you are prompted to press PLAY). On finding a file header there are two possible responses:-

No room for /name/ or Load /name/: Yes, No

In both cases, /name/ is the name of the file found. In the first case the main option menu is also displayed. In the second case, <N> returns immediately to the main option prompt; or <Y> loads the program, displaying the message "Loading /name/". On completion, the file details are added to the table in the central window, and the main option menu appears in the prompt window.

<S>AVE: With no files loaded, this option is inoperative. Otherwise, saving is in two phases; first, the files to be saved are marked; second, the marked files are recorded. The first prompt is:-

Save: One, Some, All

If you respond with <A>, all files displayed in the central window are marked with a small solid circle, and operation moves to the record phase. If you respond with either of the other options then a pointer is placed beside the first file name, and you are prompted:-

Options: Move, Save

You may now either move the pointer with <M>, or mark the file with <S>. If you opted for one file, <S> moves to the record phase. If you opted to save 'some' files, <S> will mark a file and move to the next file, or <M> will just move to the next file. When you reach the last file, either key moves to the record phase or, if no files have been marked, returns to the main menu. On entering the record phase, the prompt window will display:-

Tape ready: Yes No

At this point you should ensure that the target tape is loaded and wound to the correct position. On pressing <Y> you will be prompted to press RECORD.PLAY. The marked files will be saved in the order they appear on the screen. The standard "Writing /name/" message will be displayed in the message window and, as each save is completed, the file mark will be deleted. On completion of the record phase, the main option menu will be displayed in the prompt window. Pressing <N> at the "Tape ready" prompt has the same effect as pressing <SHIFT/BREAK>.

<C>LEAR: THIS OPTION REQUIRES CONFIRMATION! The prompt is:-

Clear: Yes, No

Pressing <Y> will restart the program, as if it has just loaded, resetting all the program's internal flags and pointers. Pressing <N> will display the main option menu.

<E>XIT: This command will return you to the ROM Monitor. *****

DISASSEMBLER B880, PROBE, AND Z80 MACHINE

By Maurice Hawes

With many issues of the S.U.C. Magazine out of print, newer members may not be aware that the Libraries contain three very useful, though different, machine-code utility programs which can be a great help in finding out what goes on inside your Sharp computer, in debugging machine-code programmes, and in creating assembly-language source code files from existing machine-code programs - in other words, in 'listing' them.

Most members, even those who joined recently, will be aware that I regard Tanswell's 'Disassembler BA00' (and its SUC derivatives) as the best thing since sliced bread; you could say that I refer to it with monotonous regularity. But it is a long time since I mentioned 'PROBE', and even longer since editorial attention was paid to 'Z80 MACHINE'. So I hope I may be forgiven for drawing attention these programs, and using up Magazine space to do so.

DISASSEMBLER BA00 ON THE MZ-80K

Robert Tanswell wrote his original Disassembler in 1980-81, for the tape-based MZ-80K. A master tape carried three versions, which loaded at BA00H, 8000H, and 4000H, meant for the 48K, 36K and 20K RAM models of the MZ-80K respectively. In the event, 48K RAM soon became standard and the 8000H and 4000H versions were rarely used.

In contrast, DISASSEMBLER BA00, which occupies BA00H - CDD3H, became very popular, partly because of its compatibility with ZEN, but also because it creates good source code, with relative jump addresses calculated and labelled, and a blank line after every unconditional return or jump to split the code into sections.

DISASSEMBLER BA00 has three relatively minor 'bugs'; the only one that matters is in the COPY (i.e. SAVE object file) command; the filesize is calculated as the straight difference between the FROM and TO addresses, and will only be correct if you give the TO address as the one AFTER the last byte you wish to save.

The other two 'bugs' are very minor; negatively-indexed IX and IY instructions have the indices in 256 complement form; and the mnem. 'PO' is printed out as 'P0'. These two 'bugs' will only cause problems if the disassembled files are transferred to 'ZEN'.

VERSIONS OF BA00 FOR OTHER SHARP COMPUTERS

Robert Tanswell subsequently produced versions of 'DISASSEMBLER BA00' for the MZ-80A and the MZ-700; and a modified version called 'DISASSEMBLER A000' for the MZ-80B. I believe that these variants of the program all contain the three small 'bugs' mentioned above.

The MZ-80A and MZ-700 versions are essentially the same as the original MZ-80K version, with only minor code changes to suit the different character sets and keyboard-scanning arrangements. The MZ-80B version executes at A000H, but then jumps straight to BA03H; and from that address onwards the program is structurally identical to other versions. However, it is changed in many details to suit the MZ-80B RAM Monitor, and as a result the code is altered in many places, and ends at CE2AH (instead of CDD3H).

USING THE TANSWELL DISASSEMBLERS

On entry, a menu of commands appears and the command prompt '/' is displayed, with a flashing cursor. Illegal entries cause a 'beep' and the program waits for valid entry. The Menu is largely self-explanatory, but the first-time user must know that 'H' is required after a 4-digit Hex address, and that the 'D' command contains a 'T' option, to make ZEN-comptatible source code tapes.

It is also necessary to know that a 2-digit Hex Byte value does NOT need an 'H' to confirm it, and that a scrolling display may be held by tapping the SPACE BAR, at which point another tap will restart, or CR will return to command mode.

These above points were covered in the original documentation, and will be referred to below, in more detail.

The '#' command toggles a flag which sends the output of the 'D' and 'M' commands to the printer as well as the screen, one line at a time. Unfortunately, printer output is not paginated, but this has been remedied in the SUC versions of the program (see below).

The printer routine at BBB6-BBF2H (BBB5H-BBF1H on the MZ-80B) is meant for a Sharp printer; nevertheless, as the status checks are short and all important text is in upper-case ASCII, the routine works with most other printer systems. The character stored at BFE8H (C030H on the MZ-80B) is meant to produce the blank line feeds in a hardcopy listing; 0DH works for ALL printers.

THE SUC VERSION OF DISASSEMBLER BA00 FOR THE MZ-80K/A/700

This version is known as 'B880 MASTER'. It has several built-in 'patches' to suit any MZ-80K/A/700/printer system, and the three known 'bugs' have been removed. It also offers the following:-

a) Improved layout of some indexed IX and IY source code.

b) Hard copy paginated automatically (at 60 lines or to choice), or manually at any time from the keyboard.

c) A new command enabling a line of text up to 80 characters to be sent direct from the keyboard to the printer.

d) A full or partial screen dump to the printer.

e) Optional Sharp/ASCII lower-case conversion for printer, if required by software (also converts Sharp graphics to '.').

f) Shortened printer error message with improved display layout.

g) A much faster bytesearch routine (as devised by Peter Tuffs).

h) (On the MZ-80A/700) A modification to ensure that a saved filename is always terminated by an 0DH character.

j) (On an 80-column MZ-80A) A modification to keep the screen in 40 columns whilst using the Disassembler.

MODIFYING B880 MASTER TO SUIT YOUR SYSTEM

'B880 MASTER' as supplied will run on an MZ-80K with a Sharp P3 printer. To modify the programme for the MZ-80A/700, or to alter the printer software to suit other printer/interface sytems, perform the following changes as necessary, using the 'W' command, and then save a copy as instructed below:-

```
For the MZ-80A: W BB08H F4              (to scan KBD for space bar)
                W BB11H 01              (ditto)
                W BBA9H D5 B8           (to change 80H to 20H)
                W BC80H 3E 0D 32 01 11  (to ensure 0DH at 1101H)
                W BD17H 8D B8           (to slow down scrolling)
(80-col only)   W B881H 00              (to give a 40-col. display)

For the MZ-700  W BB08H F6              (to scan KBD for space bar)
                W BB11H 10              (ditto)
                W BBA9H D5 B8           (to change 80H to 20H)
                W BC80H 3E 0D 32 01 11  (to ensure 0DH at 1101H)
                W BD17H 8D B8           (to slow down scrolling)
```

If your printer requires it, change the 'Form Feed' character at B94EH from 0FH to 0CH. In addition, if you wish to convert Sharp L.C. to ASCII L.C. in software, change B8B2H from C9 to FE (this also converts graphics to '.'). With some printer/interface combinations you may also need three 00 bytes at BBCA-BBCCH.

To make a copy with your changes in it, use the 'C' command; the FROM, LOAD and EXECUTE addresses are all B880H, and the TO address may be given as CDD3H.

THE COMMANDS IN B880 MASTER

The opening Menu appears as:-

```
D xxxx yyyy   Disassemble from xxxx to yyyy
M xxxx yyyy   Memory dump from xxxx to yyyy
W xxxx        Hex Write  from xxxx
G xxxx        Start program from xxxx
C             Copy Routine (see leaflet)
T             Type to printer
!             Screen dump to printer
#             ON/OFF printer echo (**)
B             Bytesearch from xxxx to yyyy
  (**) Paged at 60 lines or on G CD48H
```

NOTES

Addresses xxxx and yyyy must be entered in 4-digit HEX followed by the letter 'H'. If the addresses are not valid (e.g. if xxxx is greater than yyyy) the program returns to command mode. If any other key is pressed in place of 'H', the address is cancelled.

Under the 'B' and 'W' commands, byte codes must be entered in 2-digit HEX. In this case, the program accepts any valid pair of hex digits as soon as it is typed in, and automatically displays a space after it. The chance for confirmation with 'H' is NOT allowed, and screen editing is not possible. Therefore great care is necessary with these commands, as the only way to correct a mistake is to exit with 'CR' and start all over again.

FURTHER DETAILS OF THE COMMANDS IN B880 MASTER

'D' asks for OPTION (see 'T' below) then asks for DATA blocks, which MUST be entered in ascending numerical order. To start the disassembly, enter CR as start of a DATA block.

'C' asks for FILENAME (up to 16 letters) then FROM, TO, LOAD and EXECUTE addresses. The TO address is the last byte to be saved.

'D' and 'M' displays may be held by tapping the space bar; at this point, a second tap on the space bar will continue, or CR will revert to command mode. It is also possible to 'inch' a held display with a long press on the space bar.

'!' dumps part or all of the screen to the printer. The number of lines dumped (from top down) is stored at B90FH (default = 19H)

'T' enters the keyboard input mode; up to 80 characters may be typed in, with the normal cursor-editing and upper/lower case facilities. The text is sent to the printer on 'CR'.

'G 0000H' returns to the Monitor
'G BA00H' re-displays the opening Menu
'G CD48H' sends a form feed to the printer

An automatic 'Form Feed' is sent to the printer at the end of each page; the lines per page is set at B946H (default 3CH = 60 lines).

PRODUCING ZEN-COMPATIBLE SOURCE TAPES

On entering the 'D' command, you are asked for OPTION. In fact, there is only one option available, 'T', and you should use this only if you wish to produce a ZEN source tape. Any other response will be ignored, and the 'D' command will then continue normally.

If you enter 'T' you will be asked for a FILENAME. The program then asks for the usual xxxx, yyyy, and any DATA areas. It then disassembles the first block of source code (up to approx. 4k) to the screen AND to a buffer at A000H. Thereupon, you are asked to PRESS RECORD/PLAY, to record the first block of source from the buffer. If the source code is longer than 4k (and the RECORD/PLAY buttons are left depressed) the process is repeated automatically in blocks of 4k until the disassembly is complete. The program reverts to command mode, and the recorder should be switched off.

The source code tape may subsequently be loaded into ZEN, using the ZEN 'R' command. If the Disassembler has produced more than one block, the blocks must be loaded separately, one after the other. If the assembled code is not to be modified, the addition of ORG, LOAD and END statements will create a valid ZEN source file; alternatively, you may edit the file further under ZEN.

Suppressing EQUATES

A disassembled source file ends with a list of EQUATES. If you wish to re-assemble the file these are essential, but if you just want to read the listing they are not. To suppress the list of equates, change the address at BEEDH, from BE11 to BA87.

Minor operational differences between 'BA00' and 'B880 MASTER'

In 'BA00' the ASCII equivalents of 00H-1FH and 7FH are displayed as spaces; in 'B880 MASTER' the equivalents of 00H-1FH, 60H-68H and 7FH are displayed as '@' (this avoids problems on the MZ-80A).

In 'BA00' the 'C' command saves up to the byte before the 'TO' address. In 'B880 MASTER' the 'TO' address is the last byte saved.

'B880 MASTER' there are 3 re-entry points; B880H for the MZ-80A; B900H for the MZ-80K and the MZ-700; and BA00H.The first two reset the printer line count to 0; the third one does not.

Memory usage

The current segment of a 'ZEN' tape file is stored in in a buffer which starts at A000H. Therefore if the disassembled file is being saved to tape, any program which extends above 9FFFH is corrupted.

The main code ends at CDD3H, but the DATA addresses, entered from the keyboard under the 'D' command, are stored at CDD4 upwards.

The Monitor work area 11A3-11FFH is used by the Disassembler.

B800 MK5/P6 FOR THE MZ-80B

'B800 MK5/P6' is based on R. Tanswell's 'Disassembler A000' for the MZ-80B. The first thing to note is that both disassemblers need the SB-1510 Monitor in place, and are loaded from it.

Close examination of 'Disassembler A000' shows that much of the area A000H-BA00H is used for internal purposes (see below). But there is an unused area at B800-B9A0H, and this has been used in 'B800 MK5/P6' for many of the improvements from 'B880 MASTER'.

However, due to these space limitations, 'B800 MK5/P6' does NOT include the large patches needed to make all IX/IY instructions compatible with 'ZEN', nor does it include a screen dump command.

Changed and new commands in 'B800 MK5/P6'

The Menu is the same as that for 'B880 MASTER', except that the screen dump command '!' has been replaced by a printer command 'P'. This is provided because the MZ-80B versions of Tanswell's Disassembler assume that the printer is set to AUTO LF. Some printers require a software command to set them up in this way, and the new 'P' command is meant to do this. As supplied, it sends the code sequence $1B $0A, which sets up a Sharp P5 or P6 printer to AUTO LF. If you wish to change this code sequence, see below.

'T' enters the keyboard input mode; up to 80 characters may be typed in, with the normal cursor-editing facilities and upper/lower case switch. The text is sent to the printer on 'CR'.

'G 0000H' returns to the Monitor
'G B800H' re-displays the opening Menu
'G CDA0H' sends a form feed to the printer

An automatic 'Form Feed' is sent to the printer at the end of each page; the lines per page is stored at B824H (default 3CH = 60).

Minor Operational differences between 'A000'and 'B800 MK5/P6'

In 'A000', the display scrolls so fast that it is illegible; it can be stopped and restarted with the SPACE bar, but it cannot be 'inched' (which under the circumstances is a real snag). In 'B800 MK5/P6' the screen display is slowed down, and may be controlled by the BREAK key - short taps to stop and restart, or a longer press to 'inch' to the next line. When stopped, CR will exit.

In 'A000' the 'C' command saves up to the byte before the 'TO' address. In 'B800 MK5/P6' the 'TO' address is the last byte saved.

In 'A000' the normal re-entry point is A000H (although BA03H would do just as well). In 'B800 MK5/P6' the re-entry point of A000H is NOT VALID (and will crash); it is replaced by B800H, which is the normal execution address of the new version, and resets the printer line count to 00. Alternative re-entry points are BA00H (which does not reset the printer line count, but does send the printer 'P' code sequence), or BA03H (which does neither).

Memory usage and security copying

The current segment of a ZEN source file is stored in a buffer which starts at A003H. Therefore if the disassembled file is being saved to tape, any program which extends above A002H is corrupted.

The main code ends at CE2AH, but DATA block addresses are stored at CE2D upwards. Therefore the area CE2BH - CFFFH is not free.

The area B9A1-B9FFH is used for flag and data buffers, and a 40-byte keyboard input buffer.

You can't use 'C' to make a self-copy (it uses the internal work area B9A1-B9FFH, which is saved with the rest of the code; under these circumstances you will get 'checksum error'). Therefore, to save a copy of B800 MK5/P6 on tape, you must return to MONITOR SB-1510 and use the 'S' command, entering the parameters as:-

S = $B800, E = $CE2A, J = $B800

Examples of the changes which you may wish to make before you make a working copy of 'B800 MK5/P6' are:-

a) Cut out second call to PTEST routine (put 3 NOPs at BBC9-BBCBH)
b) Suppress EQUATES (change address at BF2EH, from 49 BE to 89 BA)
c) Change codes sent by 'P' (default 1BH 0AH, at B882H & B886H)
d) Change hardcopy blank line character (default 0DH at C030H)

B800 MK5/P6 as supplied runs with a Sharp P5/P6 printer, PROVIDED THAT THE 'P' COMMAND IS USED TO SET THE PRINTER TO DO 'AUTO LF'.

SUMMARY OF TANSWELL'S DISASSEMBLERS AND THEIR DERIVATIVES

The main advantage of these programs over other disassemblers is that the source code is very readable and can be saved to tape in ZEN-compatible format. The SUC versions are 'debugged' as far as is possible (though owing to lack of space the MZ-80B version still produces negative IX/IY indices in 256-complement form). All the SUC versions allow hard copy listings to be properly paginated and interspersed with comments from the keyboard if desired.

PROBE for the MZ-80K, MZ-80A (and MZ-700 ?)

The original version of PROBE for the MZ-80K was written by Barrie Frost and was reviewed by Bill Coombes in Vol.3 No.1; at that time Barrie was selling the program commercially. In 1986 he presented the program to the Club Library and also modified it to run on the MZ-80A. The two versions are virtually the same to the user, except for the fact that the MZ-80A version does not have the minor controls offered by the MZ-80K blue keys. And as far as I have been able to detect in recent limited tests, the MZ-80A version also works on the MZ-700.

The full instructions for the MZ-80K version appeared in Vol.6 No.1, but as this is now out of print it is seems a sensible idea, especially as far as newer members are concerned, to reprint that article, updated as necessary, in this issue.

One of the strong features of PROBE is that there are 3 copies for each machine, loading and executing at different addresses (1200H, 8000H and B600H). This means that PROBE can be co-resident with virtually any other program you care to name. Its other powerful feature is that it can single-step through any program, including the Monitor routines in ROM.

On loading, the main options are as follows:-

L = Load program from tape
W = Write program to tape
F = Find a sequence of bytes
D = Disassemble
M = Modify memory
G = Goto an address
S = Single step mode
! = return to Monitor
C = Clear Screen

All data entry must be in hexadecimal, four or two digits as appropriate e.g. 001B or 09. No terminating character (H, $ or CR) is needed, but correction is possible using the DEL key. CR or SHIFT/BREAK will abandon any entry.

L and W are fairly conventional, except that L does not allow you to name the program and the tape should therefore be wound into position beforehand. However, the header is loaded and displayed first, and you are then given a Y/N option on loading the data. If you answer "Y", you are offered the option of changing the loading address of the programme.

F finds strings up to 8-bytes, with F0 as a "wild" character.

D disassembles 12 lines of code from the start address, together with the ASCII and DISPLAY equivalents. You then have the following (unprompted) six options:-

P = Print code (Hardcopy)
C = Call disassembly address
J = Jump to disassembly address
N = do Next 12 lines
R = Return from call
SHIFT/BREAK = exit to PROBE

M warns you if you try to modify ROM contents.

G is conventional, and allows setting of a breakpoint and loop counts. When the breakpoint is reached control returns to PROBE. The options are then displayed, and are the same as in S below.

S executes a single machine-code instruction, giving you the opportunity to set registers first. After the step has been executed a very comprehensive and self-explanatory display appears, together with 4 options (or SHIFT/BREAK to return to PROBE). These options are:-

N = execute Next instruction.

A = Auto-execute i.e. step through program automatically but at sub-normal speed. On the MZ-80K the speed of execution is set by the bottom row of Blue Keys, slowest on the left and fastest on the right. (On the MZ-80A, holding down any key increases the speed by about five times.) To interrupt execution and display current status press SHIFT/BREAK.

C = Continue execution of program - equivalent to G (PC)

P = Print the status information (Hardcopy)

R = alter Register (alter PC at your peril !!)

GENERAL

PROBE printer output is obtained by a partial dump of VRAM from D000 upwards, with display codes converted to ASCII. Since the resultant characters are always below 80H, the routine suits most printers, including Sharp and Epson. There are no problems on the MZ-80A, thanks to the fact that the screen is cleared before each display, which keeps the start of visible VRAM at D000. The printer routine in PROBE B600 is at BEBE, and at corresponding addresses in the other versions.

WARNINGS

You are warned that the single-step mode can may crash if it meets a "DI"instruction, or any instructions that alter the contents of E005, E006 or E007, or any instructions which affect the jump address at 1038H. You are also warned not to alter SP unless you know what you are doing!

SUMMARY OF PROBE

PROBE is a powerful programme, and with three copies loading at different locations you are never stuck for room. Its method of disassembling 12 lines at a time is very convenient if you are scanning a large program for the first time, and its presentation of ASCII and DISPLAY equivalents on the same screen is extremely useful when you are not sure which set of codes is being used for messages. The wildcard facility in option F is very handy, and the ability to step through ROM is unique. Its one drawback, as a disassembler, is that it does not label relative jumps.

Z80 MACHINE AND ITS DERIVATIVES

The original 'Z80 MACHINE' machine program appeared in the Club Library in its very early days, as 'Z80 MACHINE v8.0', and it was first reviewed in Vol.2 No.1. It is clear from that review that the program was written for the MZ-80K and originated in Germany, and that the reviewer had not had time to sort out the less obvious commands. The review was reprinted, with some additional information, in Vol.2 No.2, but the picture was still incomplete.

The 'Z80 MACHINE v8.0' ran from $1200 to $35FF. The user could LOAD a machine-code program at any address above $35FF which he cared to specify, but if such a program was saved back to tape it was automatically given the LOAD address which it occupied in RAM. This was a severe drawback, as many machine-code programs load and execute around $1200, and such parameters could not be re-saved.

The first solution was by H.Neil; he added a 'patch' at $3600 - $3690 which changed the SAVE routine so that the START (i.e.LOAD) and EXECUTE addresses could be freely specified, wherever the code was stored in RAM. The program was called 'Z80 MACHINE v8.2', but it was not entirely satisfactory because the new SAVE routine required careful handling, and some prompts were still in German!

Eventually we got things right. In 1983 I modified the program for the MZ-80A, producing two versions with a better SAVE routine, English prompts, and alternative printer drivers. In 1986 I did the same for the MZ-80K, and about the same time Peter Tuffs went one better and produced versions which loaded and ran at $A200 and thus enabled most machine-code programs to be loaded in their normal locations. The picture at this stage was:-

MZ-80K: Z80 MACHINE.K2/S (Sharp printer driver and improved SAVE)
Z80 MACHINE.K2/M (ASCII printer driver and improved SAVE)
Z80 A200.K2/S (as K2/S above but relocated to $A200-C6FF)
Z80 A200.K2/M (as K2/M above but relocated to $A200-C6FF)

MZ-80A: Z80 MACHINE.A1/S (Sharp printer driver and improved SAVE)
Z80 MACHINE.A1/M (ASCII printer driver and improved SAVE)

The conversion to run on the MZ-80A was more difficult than we expected, owing to the large number of calls to addresses in the middle of Monitor routines, and for this reason we never produced relocated versions for the MZ-80A. But to our surprise, a SPANISH version of Z80 MACHINE V8.0 for the MZ-700 appeared in the U.K. in 1989! It was called 'CPU Z80A SHARP' and was being sold in Spain with a copy of S.U.C. Vol.2 No.2 p.17 as its instructions! It is relocated to $AC00-CFFF, and seems to work perfectly, including even the obscure 'Z' commands. It is in the MZ-700 Libary as:-

Z80 MACHINE.700 (Sharp driver, original V8.0 SAVE)

Given the location of this program, an improved SAVE routine would be only of marginal advantage, and there is no room for it anyway. MZ-700 users will therefore have to 'make do', but a modified (ASCII) printer driver would be useful. Volunteers ?

WARM START is always $4B above START e.g. $124B, £A24B, $AC4B

THE COMMANDS IN Z80 MACHINE AND ITS DERIVATIVES

Z80 MACHINE V8.0 and 8.2 are covered in Vol.2 No.1, Vol.2 No.2, and in S.M.I. These are all still available so I shall be brief:-

A - prints the main register set; contents may be screen-edited
B - sets/clears break points, counts 1-9 allowed (or 0 clears)
& - clears ALL breakpoints
C - prints alternate register set; contents may be screen-edited
D xxxx yyyy - DISPLAY RAM; SPACE/CR/BREAK to hold/continue/exit
E - EXAMINES (compares) two areas of memory; SEE BELOW
F - displays the state of the FLAGS
G xxxx - GO TO xxxx (Execute at xxxx)
H - converts HEX number (4 digits) to decimal (prompts with ?)
I xxxx - converts HEX number (4 digits) to BINARY (no prompts!)
J is used as a prefix to A,C,M,P,R to force BINARY display
K - fills block of memory with a specified code; prompts given
L - locates a string; prompts given; DON'T USE SHIFT/BREAK!!!!!
M xxxx yyyy - DUMP area (allows screen editing, confirm by CR)
N - NEW (restarts program at $1200, which clears user RAM)
O - disassemble specified area (prompts for start and end)
P - displays SPECIAL registers (PC, SP, IX, IY, I)
Q - QUEUE LOAD; load header, then specify LOAD address; SEE BELOW
R - display ALL REGISTERS; screen-editing NOT allowed
S - SAVE tape file; SEE BELOW
T xxxx - allows direct TEXT input to RAM, including spaces and CR
U xxxx - calls the given address e.g. U 0030 plays music
V - verfies a tape file; prompts for filename, gives ERROR or OK
W xxxx - allows HEX input to RAM; auto-spaces on screen, CR exits
X - block move; prompts for block (FROM/TO) then new start (TOP)
Y - YANK i.e. load program at normal address without executing it
Z - complicated clock/timer commands (ZS,ZA,ZR,ZWT,ZWS). See SMI
- printer echo ON/OFF (toggle)
1 aa bb - gives sum and difference of two HEX bytes (aa > bb)
2 xxxx yyyy - ditto but with two 4-digit HEX numbers (xxxx > yyyy)
! - jumps to Monitor cold start
- aa (i.e. 'minus' sign followed by 2-digit HEX) gives CPL and NEG
* + / = are logical operators (AND, OR, XOR, CP); e.g. * aa bb
@ - single step; to use this you really MUST get Software Manual I

THE MOST USEFUL COMMANDS

E - EXAMINE; COMPARES two areas of RAM and prints out differences; Prompts for start/finish of first area, and start of second area. AMAZINGLY USEFUL for comparing two copies of the 'same' file, to find out where and how it has been corrupted or changed.

Q - An essential companion to 'E', as it enables you to load two copies of the 'same' file into non-overlapping locations.

S - SAVE in V8.0 prompts with FROM? and TO?; it uses FROM as its LOAD address, and then waits UNPROMPTED with flashing cursor, for an EXECUTION address! If you default with CR, EXECUTE = $0000!!

SAVE in V8.2 prompts and waits as in V8.0; then you MUST enter an address (any 4-HEX will do) to make it prompt START and EXECUTE!

SAVE in the later versions prompts for FROM, TO, LOAD, EXECUTE

SUMMARY 'Z80 MACHINE' is worth it for 'Q' and 'E' commands alone!

DISKEDIT UPDATE by John Edwards and Maurice Hawes

DISKEDIT allows you to read, display, edit, and rewrite a chosen disk sector on a SHARP BASIC disk on the MZ-80K/A/700/800. Current versions allow character equivalents to be altered globally; they also allow data to be complemented and/or rewritten to a different sector. Before using DISKEDIT, you MUST be familiar with the disk layout on your machine; see e.g. 5/3/37 (K) or 7/3/43 (A/700/800).

On loading, DISKEDIT prompts for Drive(1-4), Track(0-69), and Sector(1-16). The whole of the specified track is loaded into RAM, but only 128 bytes are displayed (one sector on the 'K', but only half a sector on the other machines). A Menu is then displayed:-

E - EDIT bytes on display. The cursor jumps to the top line; you have full cursor control, and any byte on display may be edited by overwriting it. Note, however, that any line which has been changed MUST BE CONFIRMED with CR before leaving it. To exit from EDIT, enter any non-hex character, then CR.

W - WRITE sector to disc. This command will replace the current sector on the disc, with the current sector from memory.

- Copy display to printer in 80 columns. The first call asks 'type of printer' (Sharp or ASCII); after which it is assumed unchanged. On the 'K' a printout shows the current sector. On the other machines it represents the current half-sector.

F - move FORWARD one sector (or half sector)
B - move BACKWARD one sector (or half sector)
A - show ASCII (Sharp) character equivalents
S - Show STANDARD ASCII character equivalents
D - Show DISPLAY character equivalents
! - Return to ROM Monitor

The following UNDISPLAYED options are also available:-

HOME - move to first sector of current track
SHIFT/F - move to first sector of next track
SHIFT/B - move to first sector of preceding track
SHIFT/A - as 'A', but characters displayed as if top bit reset
SHIFT/S - as 'S', but characters displayed as if top bit reset
SHIFT/C - complement the buffer and redisplay the current sector
SHIFT/W - write to a DIFFERENT sector (Dr/Tr/Sec prompts given)
SHIFT/BREAK - return to opening display.

A WARNING is given if you try to leave the current track without saving edited sectors. You are given the option of saving edited sectors one by one, or leaving the track without saving them.

To obtain DISKEDIT, send a blank tape w. postage to John Edwards (address on p.3). PLEASE specify which version you want:-

MZ-80K - DISKEDIT.K4
MZ-700 - DISKEDIT.704, 704/80, 704/40SS
MZ-80A - DISKEDIT.A4
MZ-800 - DISKEDIT.804/80

Where necessary, 80-track and 3.5" 40-track single-sided versions are available, as shown above. Standard versions are 70-track.

P.S. If you have DISKEDIT.A4, change $819E from $B9 to $B1 (this affects the 'SHIFT/C' command, future copies will be correct). ***

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Software Manual III

Software manual III, published August 1990, is just what many Newcomers will have been waiting for. Quoting from Software Manual III's Editorial it is: "a summary of the behaviour of Sharp MZ-80K/B/A/700/800 computers and their Basics. It is a truly remarkable achievement by our editor Maurice Hawes (backed up by several Club Members, whose help he acknowledges in the Manual).

To my mind it is mind boggling! For most people it would have been a year of steady work to put it together, but somehow Maurice has managed it between a couple of Magazine issues! However perhaps not everyone will wish to lash out and spend £2 unless they can establish a need for the information provided in the Manual. Thus I thought in this issue I would combine two objectives: first to give members enough information about Software Manual III to allow them to judge whether it will be helpful to them; secondly to provide an index so that those who do obtain it can quickly locate any information needed. The first objective is the more important since the Manual is so well laid out that it does not take long to locate the information needed. The index which follows is designed to keep the information tabulated under the various machines: thus you can quickly see "what's in it for you".

There is almost nothing in Software Manual III that I want to quibble with; except perhaps I would not give quite such a whole-hearted recommendation to MZ-80K owners towards fitting a reset button. You are only likely to crash your computer frequently if you are doing machine code programming, or it you are running a program which has been *very* badly written. Thus unless you are a machine code buff, you are likely to only occasionally experience a crash. Then, perhaps, you won't mind lifting the lid of your MZ-80K computer (assuming that you have left the screws out, which I always do) and inserting a bent paper clip at the appropriate place to join up the two contacts mentioned on page 6 of Software Manual III, under "Fitting a RESET switch to your MZ-80K."

As mention the index on the following pages is not just a general index. It is divided into sections: General, MZ-80K, MZ-80A, MZ-80B, MZ-700, MZ-800, and Sharp MZ Basics 1980-84. Thus you can decide where your particular interests lie and look through the applicable sections.

A section of Software Manual III that will be of particular interest to Newcomers is the one entitled, "The Development of Sharp MZ Basics 1980-1984." This gives a lot of information that has been of great interest to us Sharp owners for many years, but, until now, the information has been difficult to come by. The next two pages summarize the goodies available in Software Manual III.

MZ-700

MZ-800

Sharp MZ Basics 1980-84

*1 (under CP/M. Not in Club Library).

Sophisticated word processors

When I was using the Seetex word processor on my MZ-80K, I was always wondering what the more sophisticated word processors, like Wordstar, offered in comparison, and how difficult it would be to make use of all their facilities. Now that I am using Microsoft's **Word 5** (under MS-DOS) it is possible to make the comparison.

In Vol. 9/3 pp.21-25 I talked about the difficulties of sorting out fonts when using **Word** in conjunction with the Hewlett-Packard Deskjet Plus printer. Since then my opinions have changed somewhat: I mentioned then that most people were said to only use about 10% of a word processors facilities. My initial thoughts were to act on this and learn only what was needed. My revised view is that if one is going to use a word processor a lot then it is best to accept that it is worth learning about 95% of it, even though this inevitably takes time. In the long run *not* learning it will waste time. On the other hand one has to admit that there is a temptation sometimes to play around with a complex word processor: it's rather like writing programs in BASIC! On the whole though playing around is a necessary part of the learning process.

Perhaps the best way of conveying this is to describe how to use **Word 5** to achieve the layout on this page, which is, I hope, as prescribed by our revered Editor!

Using Word 5 to lay out the main text

Maurice likes us to aim for 58 lines of main text per page. As each line is 1/6" this is 9.67". An A4 page is 11.7" long so this leaves 11.7-9.67 = 2.03". Let us say 1" at the top of the page and 1.03" at the bottom. This is set by using **Esc** to call the main menu, then **F**ormat **D**ivision **M**argins to get the required menu for setting margins. It is then a simple matter to type in 1 and 1.03 for top and bottom margin respectively. We won't bother to mention the width margin settings, though these would also be set at this time.

If you now put the cursor in the top line of the page, the status display (at the bottom of the screen) will show L7, i.e. the cursor is in line 7. This read out is precise. For example if we set 1.083" for the top margin the read out will be 7.5" (since half a line is 1/12"=.083"). An odd quirk is that although experiment shows that Word acts on this accuracy (as reflected in the status line) the *menu* only stores two significant figures.

Using Word 5 to set the Running Head

Having typed in the header at the top of the page use **Esc** to call the main menu then **F**ormat **R**unning-head, and choose 'Top' and 'First page - yes' in the appropriate fields. Now we have to decide the distance from the top of the page for the Running-head. Maurice wants the header on line 5 of the page (with line 6 as a blank line). Remembering this we use **Esc** to call the main menu, then **F**ormat **D**ivision **M**argins again. Putting the cursor in the "running-head position from top" field, we might then ask for "Help".

The "Help" page would tell us that this field "Specifies distance between top of page and top of running head.... Type number in inches." Thus, we see, that what we need are four blank lines at the top of the page, and since each line is 1/6" and since 4/6" = 0.667", what we need to enter is .667. Nothing very difficult, but it does take some time to absorb these sort of details, and there are more things to think about.

Changing the Running Head

In the SUC magazine every page tends to have a slightly different Running Head. In **Word** a Running head applies to the *whole Division*. Thus if you want a different Running Head for each page, then once your text is finished and the pages established, you need to make a new Division at the start of each page. This is not difficult, and the Running-head which has previously been set up, can be easily copied (and then slightly altered) for the other pages.

In another situation (not the SUC magazine) one might need to include page numbering. There is another menu, namely Format Division Page-numbers, which will allow for continuous page numbering through the Divisions. But there can be disadvantages associated with the need to divide pages up into Divisions; this is associated with footnotes.

Problems with footnotes

There are two options for footnotes: either they can come at the bottom of the page or at the end of the Division. What you might want though is for them to come at the end of the chapter, or even at the end of the book. This option is no longer available to you in Word if you need to divide your pages up into Divisions to adjust the Running-heads.

MZ-80K tape drive contact cleaning

With some of our old editions being no longer available it is worth repeating some tips from the older issues. In Vol. 8/1 John Edwards had a good tip for those having trouble with their tape buttons. He told us that the answer is to clean the spring-loaded contacts which are located beneath the recorder; lift the lid and look just behind the recorder pulleys, in the middle of the triangle enclosed by the belt; operate the PLAY button and you will see the contacts move. The best way to clean them is to put a few drops of contact cleaning fluid on a piece of white card, insert it between the contacts, operate the PLAY button, and move the card to and fro. Repeat until the card remains perfectly clean.

Obtaining 'Contact Cleaning Fluid' is no problem for hardware experts like John Edwards, but for others, may I refer you again to page 15 of Vol. 10/2, where I described my success with something sold, under the 'Panda' trade name, as "Multipurpose Solvent". Some of my old MZ-80Ks are not getting much use these days. Tricks of the trade, by way of applying the sharp probe of a vacuum cleaner to recalcitrant keys, and a drop of contact cleaning fluid when that fails, are now becoming essential. **

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N.B. My address is likely to change some time late in 1990. Contact the Editor if you cannot find me!

EDITORIAL

Maurice tells me that there is a backlog of material that really must be published, which had to be left out of Software Manual III. So I don't have to do too much writing this time....but do note that my address may change in the near future.

MORE EXPRESS DETAILS

In Vol.10 No.2 I mentioned some EXPRESS interpreter code involving square brackets, which I hadn't deciphered. I now have the answer and it isn't the one I expected! There are two variants of the syntax, [v+] and [v++], where v is a variable, an integer in the range 0000H - FFFFH (0-65535) which, of course, can always be interpreted as an address. They are interpreted by EXPRESS Basic as follows:

```
[v+]    =  PEEK(v):v=v+1

[v++]   =  PEEK(v)+256*PEEK(v+1):v=v+2
           or DEEK(v):v=v+2
```

As an example, the following program will display the beginnings of a disassembly of EXPRESS Basic:

```
10 A=$1200
20 FOR X=1 TO 10
30 PRINT#4A," ",#2[A+]," ",#4[A++],/
40 NEXT
```

Remember, in EXPRESS, PRINT#2 and PRINT#4 print the argument as a 2 or 4 digit hexadecimal number, and the final slash forces a line feed (otherwise omitted by default). Besides printing these special functions, you can assign them. You can even use the function just to increment a variable; you do this by assigning a dummy value to it, e.g. [A+]=x where x = any number or variable:

```
10 A=$1200:[A+]=123:B=[A++]:[A+]=X:C=[A++]
20 PRINT B,C
```

will print the first two address in the jump table at the start of EXPRESS, the cold and warm start entry points.

I have mentioned the problem with EXPRESS BASIC file types before. EXPRESS deals normally with the actual file names (which may be from 0-16 characters in length, plus $0D) and with the filesize, load, and execute addresses; but it completely IGNORES the file type byte. This means that unless you issue the command POKE$10F0,2 before saving a file, then it remains set as 1, the value that indicates a machine-code file. The file type byte will

hold this value for one of two reasons; either because the byte was loaded with 1 as EXPRESS itself was loaded from the SHARP monitor; or because the EXPRESS monitor S command has been used (this, for some curious reason. is programmed to insert 1 into the file type byte automatically).

For those who understand hexadecimal numbers and RAM addresses, EXPRESS makes the ideal vehicle to bridge that gap into machine code and assembler programming. It has bugs, but armed with my newly labelled source listing, they are all capable of cure. Unlike FDOS and the German SA-5510 compiler which have floating point arithmetic, full trignometrical functions and string handling, the runtime files for EXPRESS are small, and will be made smaller if I get my way.

80-COLUMN TAPE BASICS COMPARED (SA-5510+Kuma mod)/(Hippo SA-5580)

In an effort to bring my Library tapes up to date I asked Ian to send me a copy of the program shown in the Vol.10 No.1 Library list as BASIC.SA-5510/80. My copy, which came on disk, proved to have the standard filename BASIC SA-5510.

My immediate assumption, later proved correct, was that it was created by incorporating the patch given in the documentation that comes with the Club (KUMA) 80-column Kit. All this does is to allow you to toggle between 40-column and 80-column modes with the command USR(13208). This can be done either as a direct command or within a program. With this BASIC, in 80-column mode, the SET, RESET and COPY/P1 commands do not work and the CURSOR command still has the 0-39 column limit.

One of the tapes I acquired when I obtained my MZ-80A with the HIPPO 80-column mod, was an original master which contained a file called BASIC SA-5580. It is a far better 80-column tape BASIC than the KUMA version, with similar features to the KUMA SA-6510 patch. It toggles between 40/80 columns with USR(4977), and in 80-column mode the SET, RESET, CURSOR and COPY/P1 commands all work. The CURSOR and COPY/P1 commands also work in 40 columns, and SET and RESET only require POKE $2AE9,40 for them to work as well (POKE$2AE9,80 re-enables SET and RESET in 80-column mode).

Recently, I swapped my HIPPO ROM for a KUMA ROM, and discovered SA-5580 requires only three changes to allow it to run correctly on the KUMA machine. By the time you read this, there will be a KUMA version of SA-5580 in the Club Library.

COPYING BASIC.SA-5510

While working on the above I realised that new members may not be aware of the command USR($11FD). This allows a copy to be made from an SA-5510 master tape, but the copy does not incorporate the same facility. You cannot, therefore, make further copies from a copy of SA-5510 made by USR($11FD). It is easy to tell a copy from a master; a copy will not include the full stop after the word BASIC in the message that appears as the file loads. A BASIC.SA-5510 master tape can be copied AS A MASTER with the double command USR(33):USR(36), if this is issued immediately after loading the master tape from the SHARP Monitor. ***

MZ-80A LIBRARY NEWS
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Library News

THE ADDITIONS

Greg has prepared a further group of DCS programs and a few of his own for the Library. There will be a few more DCS programs when some technical problems with them are ironed out. In addition, Simon Jones has kindly sent me four Knight's Games.

```
DB5     G0004 (..)(NEW INVADERS, Greedy Gremlins)
DB5     G0005 (Defender)(MZ-80A GALACTIC, SNOWFLAKES)
DB12    G1029 (..)(DOG FIGHT, POLAR SUB, BATTLESHIPS BAS)
        U0007 (..)(..DCS MZ80A RENUM, BYTESAVER SA5510)
        U0008 (CONVERTER A-700)
        U1001 (..)(BYTESAVER MZ-80A, BASIC MOD A)
        A0002 (JIGSAW)
        A1010 (..,MILK ROUND, TIME CHARGE)(ADDRESS BOOK,
                INVOICE CONTROL, SUNDRY CREDITORS)
        A1011 (STOCK CONTROL, LP GAS FLOW, DEFERMENT)
                (LETTER WRITER, MAILING LIST, PRINTER PACK)
        A1012 (REPORT WRITER, POSTER PRINTER, DATABANK,
                DATABANK 2)(INVENTORY, TIMECHARGE 2)
        T1003 (BUFFER DEMO, SOUND EFFECTS)
DB9     E1005 (GEOGRAPHY, Y GEIRFA, FRENCH VOCAB)(MATHS SOLVER)
CW1     M9003 (CCU1MAN,APOKEMAN)
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THE ALTERATIONS

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DB1&ID1 U0003&I1001- CLUB COPY.U1 replaces CLUB COPY.A1
        U0101- CLUB COPY.U1 replaces CLUB COPY.A1
DB1&ID1 U1601- DISK>CMT.A6B replaces DISK>CMT.A4
DB11    U0007- BASIC.SA-5580 replaces BASIC.SA5510/80
```

CLUB COPY.U1 is an improved version of its near namesake. It recognizes for itself into which model of the Sharp computer it is being loaded! The new manual is on M9003 and CW1. John has done some further work on the Disk to Tape utility, hence the new version DISK>CMT.A6B. BASIC.SA-5580 is an 80-column version of SA-5510 with some advantages over the Club's previous version. Greg explains the details in a separate article in this issue.

PROGRAM REQUIRING MZ-80K VRAM SETTING

Please note that LASER DEFENCE (DB8/G1024) requires THE MZ-80K VRAM setting, and will not run on an 80-column MZ-80A unless it is fitted with the Club's own "double monitor" ROM.

ADVANCED WARNING OF FORTHCOMING DELETIONS

Will all members please note that from the next Magazine, programs that cannot run with SA-6510, or which rely on tape use for data recording, will be removed from the disk Library. They will of course continue to be available in the tape Library. ***

AN INTRODUCTION TO DISK OPERATING SYSTEMS for the MZ-80A

by Greg Chapman

INTRODUCTION

This article outlines the various disk operating systems for the MZ-80A. It does not cover the hardware side of adding disk drives (but see e.g. my earlier article, Vol.9 No.2 pp.29-30). In essence, there are three separate disk operating systems available for the MZ-80A. Two were produced by SHARP, and the other is the implementation, by Micro Technology Ltd., of CP/M 2.2.

Newcomers to SHARP machines should be aware that although there is a great deal of compatibility between the disk systems for the MZ-80A and those for the MZ-80B/700/800, the disk systems for the MZ-80K are completely incompatible, because they use single-density recording. Therefore, the transfer of programs and data between the MZ-80A and MZ-80K can only be done via cassette tapes, and not through disks; this applies to all systems, including the Xtal implementation of CP/M for the MZ-80K.

DISK BASIC - SA-6510

Originally, when you bought a set of new Sharp disk drives, you also got DISK BASIC SA-6510. The package consisted of a Disk Basic Manual, and a disk containing SA-6510, two machine-code utilities, and four Basic demonstration programs. Three of the demonstrations are duplicates of the tape programs which came with the MZ-80A itself. The fourth is a stock control program which is described at great length in the Disk Basic Manual.

In normal use, to load BASIC, you just switch on the disk drive(s) and the computer, and use the <F> command to start up the disk, rather than the <L> command to load a tape. After a few seconds you reach the SA-6510 cold start display which looks very similar to the one you are used to with SA-5510. Compared with SA-5510, you now have a number of additional facilities, but a little less memory (26,604 bytes). The additional facilities are:

1. Obtain a DIRectory of the files held on a disk
2. SAVE, LOAD and VERIFY Basic programs on disk
3. RENAME and DELETE disk files
4. Write protect (LOCK) a file, so it can't be amended
5. Read and write SEQUENTIAL and RANDOM data files to disk
6. Process program ERRORS by error-trapping
7. Load or call one program from another
8. Run a program automatically on first loading BASIC (the program must be named "AUTO RUN")

There are other minor enhancements, such as the ability to issue joint commands, e.g. LOAD"program":LIST which does the obvious, and RUN"program" which will load and run a program. Like tape files (see the Owners Manual p.129), disk files may be one of a variety of types or "modes". SA-6510 recogises four, which are indicated on a directory listing as a prefix to the file name:

BTX	Basic Text files
OBJ	Object (machine-code) files
BSD	Basic Sequential Data files
BRD	Basic Random Data files

One of the main benefits of a disk based system is its ability to have up to ten separate data files open at once. Amongst other things, this allows you to have data files which are bigger than the available RAM and to be able to sort such files. A second big benefit is the ability to create random data files, from which you can read selected data items, rather than be obliged to read the whole file. Random access files, however, have a number of restrictions. Individual data items have a fixed length of 32 bytes (characters). If your item is longer than this it must be filed as two separate items on the disk, which can be wasteful of disk space.

In SA-5510, if there is a program error, the program aborts and the computer returns to the command mode. However, in SA-6510 it is possible to trap the error and send the program to a specified line number instead. In particular, this can be used to process disk errors; a disk system is subject to more types of error than a tape system and, in my experience, the chances of mis-reading a disk file are somewhat greater than with tape. However, the error-trapping commands deal with all types of error and, with appropriate programming, a suitable message or re-prompt can always be arranged, so that the program does not abort.

Loading one program from another is a way of overcoming the reduced memory which is inherent with disk BASIC. Two commands are available, CHAIN and SWAP. The first can be regarded as an equivalent of GOTO and the second, GOSUB. In both cases all the values of variables can be preserved from the original program and be used in the second.

As already explained, once SA-6510 is loaded you can obtain a directory of the files on the disk. A master disk will show those other than BASIC SA-6510 itself, which always remains "hidden" and inaccessible. Two of these are utilities. The first, UTILITY, offers four options. These will:

1. Format a disk

2. Initialise a slave disk (a slave disk does not contain BASIC)

3. Copy a complete disk - may be used to copy your master disk of SA-6510, but UTILITY must be modified to v2.0 to copy a Master disk exactly (see p. of this issue)

4. Return to the ROM Monitor

The second utility, FILING(CMT), has the sole function of transfering a machine-code file from tape to disk. I only recently discovered that CMT stands for Cassette Magnetic Tape!

You can see from all this that there are a number of weaknesses with SA-6510. It is simply a DISK BASIC, not a full operating system. There is, for instance, no command to transfer individual files from one disk to another. With BASIC program and data files you must resort to loading them then re-saving them to the other disk, but the only way to do it with machine-code files is to use the UTILITY program to copy the whole disk, and then delete the files you do not want.

If you want to copy a machine-code file to a disk with other programs already on it, you must use tape as the exchange medium. However, you can't even do that with the system files supplied; you need the Club program DISK>CMT.A6B. There are further problems with tape-based machine-code utilities. Once running, they have no facilities for handling disk files; to do that, you MUST load the machine-code program from TAPE and then reset the machine and make a jump to SA-6510's warm start (\$1300). (If you load the machine-code program off disk you overwrite part of SA-6510, and if you re-boot SA-6510 it clears user RAM and you lose the machine-code program you have just loaded). In other words, there are significant restrictions on the files you can manipulate.

In summary, SA-6510 is fine, if you only run BASIC programs and want the faster file access that is provided by disks and the additional facilities provided by the disk BASIC itself. If you want more than this then FDOS may be the answer, but as you will see, there are as many limitations with that.

FDOS - SA-7010

The first big surprise for me, was that FDOS disks and SA-6510 disks are formatted differently. However, there is a certain amount of compatibility. Importantly, you can use SA-6510's modified UTILITY v2.0 to copy your master disk. The next major realisation was that the built-in operating system code resides at 1200H upwards, in other words, you can't run any BASIC interpreter from FDOS! So, what can you do? Some say, produce machine-code files and not much else, but that is a very incomplete picture.

FDOS is, in fact, a very comprehensive package. In a number of ways it is an improvement on CP/M as an operating system. It can, of course, take advantage of all the hardware features of the MZ-80A. It also includes the best SHARP manual I've seen, although it still has omissions. There is no guidance for beginners on loading the system.

As with SA-6510, to load FDOS you simply use the monitor's (F) command. You are then prompted for the date, time and number of drives you are running. The date and time are entered in different formats and if you respond that you are running two drives, strangely, you are left logged on to Drive 2 after initialisation. Once there, you have all the built-in commands available immediately with other commands, or programs, available on files on the master disk.

The big disadvantage of FDOS is that nothing commercial has been published for the system, not even by SHARP, so you are on your own. While there is no BASIC interpreter available, with the aid of the SA-7701 compiler (included in the package) SA-5510 and SA-6510 programs, with minor limitations, can be compiled and run under FDOS, or transferred back to tape or SA-6510 disk if desired. The other principle files in the package, apart from those which do the routine tasks, such as formatting and copying disks, are the Assembler files. These form the disk version of the SP-2000 series tape-based Assembler package. Anyone who has attempted to use the tape version could easily be persuaded to get FDOS for the manuals alone!

There are one or two features of the system which might take you by surprise. All disks have a pass-word encoded on them as part of the formatting procedure. You cannot re-format an FDOS disk (under FDOS, at least) without knowing the old pass-word. All files saved to disk can be dated. However, in case you are a midnight hacker note that tripping over midnight with the clock does not adjust the date. This must be re-set manually. Individual files can be read and/or write protected.

You can change the active drive simply by issuing a command with the appropriate drive prompt in front of it, e.g. overtype a "1>" prompt with "2>" followed by the desired file name and that file will be loaded from Drive 2. Apart from the ">" prompt there is another form, "]". The type of prompt determines the type of file that will be executed. After a ">" prompt only a SYS file of the given name will execute. Following a "]" prompt a SYS file will be executed, if one of the given name is present, but failing that, an OBJ file of the given name will be executed.

As already explained SA-6510 recognises four file modes. The only one of these that FDOS recognises is OBJ. However, FDOS has four further file modes:

SYS	A System file
RB	A Relocatible Binary file
LIB	A Library file
ASC	An ASCII file

System files contain the FDOS commands which are not built-in. They load immediately above the top of the code for the built-in commands, over-writing each other as they are called.

Relocatable Binary and Library files are used by the Assembler. One of the features of the SHARP Assembler is that programs can be built up in small modules of source code and then linked together to form a single object file. This is an essential technique when writing large machine-code files whose source will be larger than RAM allows. The Assembler outputs RB files which can then be linked and run at any chosen address.

Library files are also used by the Assembler and are used as part of the linking process to form object files. Three libraries are supplied and consist of EQUATES for calls to Monitor, FDOS, and Basic Compiler routines. When writing Assembler programs this means that providing you always use the official SHARP names for

the routines there is no need to specify equates within your program. You simply link in the appropriate library files. You can, of course, create your own library files with your own names for these and other routines if you wish.

Although you may produce ASC, or source, files on a tape system, as we have seen, in SA-6510 you cannot. In a tape system they will be Assembler source. However, in FDOS they may be BASIC compiler source files as well. FDOS cannot handle SA-6510's BTX, BSD or BRD files directly. They must be converted to ASC format. In fact, the BASIC compiler does not only compile source code written in SA-5510 or SA-6510. It will also accept source generated with the text editor, normally used to create Assembler files. BASIC text produced in this way does not even require line numbers, unless, for instance, it is needed as an address for a GOTO or GOSUB statement.

Some of the other features will not be such a surprise to those used to CP/M. You can, for instance, write files which contain chains of FDOS commands which can be called at will or executed on start-up, in similar fashion to the facility which allows programs named AUTO RUN to be executed automatically in SA-6510.

In summary, FDOS is a comprehensive and excellent system, but only for those who delight in producing their own machine-code programs. There are two methods available for doing this, Assembly language or BASIC. Producing BASIC source, however, can be tedious as it may involve much format conversion work while debugging is carried out.

CP/M

What can one say about CP/M? In the prime of 8 bit computers, it reigned supreme. If you planned to up-grade your system, this was the obvious route to take. But these days what does it offer? For a dedicated SHARP user, the system has some major limitations. First, no SHARP programs run under CP/M, so you will lose access to any programs that run under SA-6510 or FDOS. Second, as most CP/M programs assume an 80-column screen, it is virtually essential to get the 80-column modification fitted. Third, many programs, particularly those you might think of as mainstream, such as dBASE II, require more RAM than the MZ-80A has available under CP/M. Finally, there is no commercial source of CP/M software for the MZ-80A. A further important point is that, contrary to popular belief, you do not have a "compatible" system. A 5.25" CP/M disk in MZ-80A format can be read by CP/M on an MZ-80B or MZ-700, but not by any other CP/M machine!!

Currently, our MZ-80A Library offers only a handful of programs on CP/M disk, the best known being WDPRO and ZENASM, both of which are familiar to members with tape systems. And that's just the point; they are based on the same programs. ZENASM does offer a number of useful additional facilities over tape ZEN, but also loses a couple of commands. Unfortunately, WDPRO files must still be fully resident in memory, which restricts you to documents of up to about 10 pages. However, WDPRO does preserve its familiar keyboard operation, isolating you completely from the CP/M environment. That is no bad thing!

The trouble is that CP/M is a very old system, which originated about 20 years ago, when 8" floppy disks were the new thing, and most people had teletype terminals not VDU screens. Everything about the system reflects this and forces a line input approach; in those days you couldn't scroll up a roll of paper and correct a wrong command by overtyping it! CP/M also makes assumptions about the host hardware, e.g. an ESCAPE key, standard ASCII and no fancy graphics. To get CP/M running at all, Micro Technology had to do amazing things to the MZ-80A keyboard. Many common operations require key combinations unfamiliar to a SHARP user. For instance "Break" is CTRL+C, and "Delete" is CTRL+H. As for the delete key itself...

Another problem with CP/M is the standard of the manuals. With the exception of the supplement which describes the specific details of the MZ-80A implementation, they are Digital Research originals. All seven of them! They vary in size from 20 to 70 pages, and come in a single A5 ring binder. All assume familiarity with CP/M 1.4., and seem to concentrate mainly on the upgrade features compared with that version of CP/M. This may not be strictly accurate, but it's the way it seems when you try to look up something. There is no index, and each section has its own contents page, with no cross-references. On top of that they were produced in the days when typesetters had no understanding of the importance of reproducing the exact character that should appear on the screen and worse, no understanding of the importance of spaces as valid and vital characters. Finally, and worst of all, because CP/M was originally written for the 8080 CPU, the Assembly-language examples use Intel 8080 Mnemonics; this is a pain, to say the least!

Although there are no commercial suppliers of CP/M software left, there are user group libraries to which to turn. The CP/M and MSDOS Users Group (Nicholas Higgins, 43 Birkbeck Road, Wimbledon, London SW19 8NZ Tel. 081 543 0824) and the Public Domain Software Library (Rod Smith, Winscombe House, Beacon Road, CROWBOROUGH, Sussex, TN6 1UL) will probably be the first two you'll approach. Their range of material is vast, over 3000 diskfuls, but much of it dedicated to particular machines, such as Osbornes, Kaypros and Amstrads, and some of their software is for MS-DOS rather than CP/M. As you might imagine, both organisations have much bigger memberships than the S.U.C., and they therefore have to pay staff to cope with the workload. In consequence, they charge for their services; so expect to pay at least £2.50 per disk on top of the annual subscription fees. Also, expect to be utterly confused by their library catalogues which appear on disks (for which, of course, you must also pay).

In summary, CP/M gives you access to disk based WDPRO and a vast range of often ill-documented software in other libraries (at some cost!). If you are equipped with an RS-232 interface or a modem, CP/M may have much to commend it. Otherwise, CP/M is best left to terminal junkies with a desire to explore every possible aspect of their machines. That, of course, may well be the majority of Club members. Those that simply want a computer to use as a tool for domestic chores probably left the fold and bought an Amstrad years ago! ***

XPATCH Toolkit Manual - by C.D. Hearn

"XPATCH-5510" is a programmer's utility for the MZ-80A, which adds several new commands and extensions as detailed below. The utility is compatible with standard SA-5510 for the MZ-80A and with the printer utility "C.P.E. Hi-Res" (which enables printing of all Sharp graphics on Epson printers). XPATCH provides the following facilities and commands:

A1. Full String Comparisons
A2. Faster Data Saving
A3. Data Tape "Found" and "Loading" messages
A4. List Pause
B1. PRINT@ X,Y
B2. CLS
C1. RENUMBER
C2. MOVE
C3. DELETE
C4. APPEND "Progname"
C5. LINE X (when used with Hi-Res only)
C6. FIND
C7. CHANGE
C8. SDEL
C9. COMPRESS
C10. XREF
D1. POKES, USEFUL SUBROUTINES, MEMORY USAGE

The available user memory with XPATCH installed is approx 30020 bytes. The focus of attention in XPATCH is to provide the programmer with powerful extra programming aids. In cases where the reduction in available program memory is not acceptable, it can be used during program development and the final user program then run under SA-5510. Obviously, this assumes the final program does not use the "extended commands" such as CLS and PRINT@.

Loading XPATCH-5510

1. With SA-5510

Load SA-5510 as normal, type MON and load the patch. The patch will make all the required changes to BASIC automatically and then return you to BASIC. The complete BASIC has been named SA-5515 and the opening screen will display the message "SA-5515 includes:", to remind you that the extension is present.

2. With SA-5510 plus CPE Hi-Res

Load SA-5510, then load CPE Hi-Res from the monitor. Return to the monitor and load XPATCH. The complete BASIC is named SA-5516, to indicate that both the Hi-Res and XPATCH are now included and the opening screen will show this.

Saving your Expanded BASIC SA-5515/5516

A working copy of the complete BASIC SA-5515/5516 can be made using the USR($11FD) command. The tape header has been set to show the appropriate version.

SECTION A - NEW FEATURES

A1. Full String Comparisons

This feature is added as standard, but may be controlled (see Section D1). Strings are compared on a "content before length" basis, and upper/lower case letters are treated as identical.

A2. Fast Data Saving

Data tapes are recorded at approx twice normal speed. This is achieved by reducing the "tone" length between data chunks. There are NO detrimental side effects - each record is still recorded twice and data tapes are fully compatible with standard SA-5510 data tapes. The "header" tone is still 11 seconds, so there is no danger of recording on the blank leader at the start of a tape.

NOTE: Although greater time savings can be made using other methods (such as reducing the 11 second header tone, recording data once only instead of twice etc.), these are detrimental to reliability and/or compatibility and are NOT used by XPATCH.

A3. Data "Found" & "Loading" Messages

SA-5510 does not normally indicate either that it has found a data recording, or the name of it, or whether it has begun loading. XPATCH adds both "Found" and "Loading" messages to help you. You can control their use if required (see Section D1).

A4. List Pause

Use the space bar to halt listing. A flashing cursor will show at the end of the line. Step through the listing by pressing the space bar again, or resume scrolling by pressing another key. To halt and step on a different key, see Section D1.

SECTION B - NEW PROGRAM COMMANDS

Two commands have been added by popular request and are common in other BASICs. But note that any program using these commands will not remain compatible with SA-5510. If you are only writing the program for your own use, this will not matter. If you later wish to make the program compatible, the CHANGE command can be used to convert them to the standard SHARP equivalent.

B1. CLS

Hardly needs explaining! CLS is a short mnemonic for "CL"ear "S"creen. This command clears the screen and homes the cursor. Don't use it if you want your program to be SA-5510 compatible.

B2. PRINT@ X,Y

This simply combines the SHARP CURSOR X,Y command with a PRINT statement. PRINT@ 4,2;"hello" will print "hello" starting at position 4,2 on the screen. The SA-5510 equivalent would be CURSOR 4,2:PRINT"hello".

SECTION C - NEW COMMANDS

C1. RENUM X-Y/A,B

Syntax: RENUM From-To/New Start,Increment. All the parameters are optional, and any/all may be omitted. Default: 0-65535/10,10.

Line numbers X-Y xspecify the part of the program for renumbering and may be used in a similar manner to the LIST X-Y command; If they are omitted, the whole program will be renumbered.

All GOTO, GOSUB, RESTORE, IF..THEN, ON..GOTO etc statements are renumbered also. NOTE: RESTORE X is allowed, although it doesn't seem to be mentioned in the SHARP manual.

Examples:

RENUM	The whole program follows the sequence 10,20,30..
RENUM-200	Lines up to 200 follow the sequence 10,20,30..
RENUM5-100/1,1	Lines 5-100 follow the sequence 1,2,3..
RENUM5-100/1	Lines 5-100 follow the sequence 1,11,21..
RENUM5-100/	Lines 5-100 follow the sequence 10,20,30..
RENUM/20,2	The whole program follows the sequence 20,22,24..
RENUM100-/,20	Lines 100 onwards follow the sequence 10,30,50..
RENUM20/21	Changes line 20 to 21

Error Messages:

ERROR 1	If X, Y, A, or B are not numbers; or if X>Y; or if all program lines less than X.
RANGE ERROR	If RENUM would change the order of the lines.
OVERFLOW ERROR	If RENUM would generate lines greater than 65535.

In all these cases the renumber will not occur and the original program will remain intact. If all the above conditions are satisfied, renumbering will begin.

ERROR 6: This may occur if the renumbered lines are bigger than the original because the renumbered program will need more space. In this case the renumber will be abandoned.

LINE C: LINE D DOES NOT EXIST may appear. This means a GOTO D, GOSUB D etc. has been found where program line D does not actually exist. LINE C will will the new line number. The bad line reference will be marked by inserting a "cursor" character at the point of error and renumbering will continue. You can use the FIND command to display these after the renumber has completed.

NOTE: ERROR 8 may occur during listing of a renumbered program if lines are longer than 78 characters. However the program will still run correctly. Listing can be restored by RENUM/1,1 to reduce the length of the lines again. (Of course, you could deliberately use this as a "list protect" method!)

C2. MOVE X-Y/A,B

The MOVE command lets you move chunks of code (e.g. subroutines) around within your program. MOVE is effectively a RENUM command with the "range checks" disabled.

The MOVE command has an identical syntax to the RENUM command and works in a similar way. It will also allow you to change the ORDER of lines in a program. If there are existing program lines within the new range selected, MOVE will detect them. (Duplicate line numbers, of course, are not allowed in BASIC!) If duplicate lines exist in the new range you will be asked to confirm their deletion - if you choose "No" then the original program will remain intact.

An example will clarify the action of the MOVE command. Assume program lines in the sequence 10, 20, 30, 40... RENUM30-60/10,10 will fail with a range error because the order of lines would change. MOVE will delete existing lines 10 and 20 and then do the renumber. The best way to see how it works is to try it on a small test program.

To summarise the above as a single definitive statement, MOVE uses the following logic to decide whether to delete a line:

Assume the lines selected (X-Y) are called FROM and TO and the new (renumbered) lines will begin at START and finish at END; then the rule for deleting any line NUM is:

If NUM is within the new range and NOT within the old range, then delete it, else leave it alone.

More formally:

IF (NUM >= START) AND (NUM <= END) THEN IF (NUM < FROM) OR (NUM > TO) THEN DELETE IT ELSE LEAVE IT

Try the above example and see what happens! (FROM=30, TO=60, START=10 and END=40).

Using RENUM you can be confident that the program will behave the same after the renumber as before. The MOVE command leaves the responsibility with you, the programmer, to check that what you are doing is correct! It has been added by request, but it can be dangerous. For this reason, although MOVE will do a normal renumber it is recommended that you use RENUM when renumbering the program is all you want to do!

C3. DELETE X-Y

A fast block delete facility that removes lines X-Y inclusive. Both X and Y must be present, to avoid mistakes, and X<=Y. To keep it flexible, X and Y do not need to reference existing lines.

ERROR 3 results if X<1, or Y>65534, or X>Y, or X>highest line No.

C4. APPEND "Progname"

Allows a program from tape to be appended to an existing program in memory. This command is very useful for adding subroutines from library tapes etc. into your new program. You can save your favourite input routine etc. using high line numbers. When you wish to incorporate a library routine into your current program, simply APPEND it, then use the MOVE command to place it in the desired position in your program.

"Progname" is, of course, optional and if omitted the first program found will be loaded.

Note that all line numbers in the second program on tape must be greater than all lines in the first program. Therefore, as mentioned above you should create all your library routines with high numbers.

APPEND may issue some error messages as follows:

ERROR 70: A bad tape
ERROR 71: Lines in the tape program are less than lines in the memory program.
ERROR 6 : Insufficient memory for both programs.

If any of these errors occurs the original program will be preserved. Any portion of the tape program loaded at the time the error occured will be removed.

C5. LINE X

The LINE command only applies to users of HI-RES and XPATCH, i.e. SA-5516. The LINE command has been added to allow BASIC to send a line feed code (0A hex) to the printer. Normally BASIC does not send a line feed with each carriage return and you can set the printer dip switch to accept this. However, some users have other (wordprocessing) software which always sends a line feed as well as a carriage return. To avoid having to alter the dip switches on your printer each time you change applications you can configure BASIC using the LINE command to match your other software.

The command LINE 0 will send <CR> only. LINE 1 will send <CR> and <LF>. Any other value for X will give a syntax error.

NOTE: If you set the correct state LINE 0/1 before making a back-up copy the new condition will be retained as "standard" on the copy.

You may wonder "Why only with HI-RES?". The answer is, there are many printer patches floating around and XPATCH cannot know where the right bit of code is in these cases.

C6. FIND "text

This command will find any collection of characters in a program. No closing quote is used so that you may include the quote character itself as part of <text>.

FIND"X=2 will find each occurence of <X=2> in the program, list the line with a cursor up arrow marking the start of the matching portion. The arrow will always be placed immediately below the matching portion of text, even if the BASIC program line occupies more than one screen line. If <text> occurs more than once in a program line, each occurence will be separately displayed.

Normally FIND will carry on searching for the next occurence and display each as it is found, but you may use the space bar to pause the command. The break key can be used to abandon the FIND, if for example, you have found the occurence you want and there may be several more occurences in the program.

The opening double quote character is optional and if present is treated as a delimiter. The effect of it is to say 'the text starts here and is to be treated literally'. If the double quote is omitted the FIND command will simply scan the line until it finds a non-space character and assume that this is the beginning of your search <text>. There is a more subtle point too - if the opening double quote is omitted <text> will be treated as a BASIC statement and any '?' character in it will translate to 'PRINT' before the search begins so you won't find what you expected!

You can look for a word preceded by one or more spaces by typing FIND" text. Note that in this case the opening quote is not optional. If you don't include it any preceeding spaces in the text will be ignored, as described above.

To help you, FIND" WORD (i.e. your required text preceded by one space) will find WORD preceded by one space, but also with more than one space. This is particularly useful when looking for text in PRINT statements which has been spaced widely for screen formatting reasons. Trailing spaces are not accepted. (This is a limitation of the SHARP monitor.)

Note that you can, of course, search for text which actually begins with the quote character by typing it twice, i.e. to find all occurences of "PRESS Y" in your program you would type in the command FIND""PRESS Y<CR>.

Two final points:

The space immediately following the program line number is considered to be part of the line number itself. It's automatically added by BASIC and therefore FIND" REM will not find REM at the beginning of a line. Secondly, the FIND command is case sensitive, so will not find characters in the 'wrong' case.

C7. CHANGE"text or CHANGE!"text

The CHANGE"text command combines the FIND command with the ability to change the <text> for something else. Two versions of the command are supplied. If you use CHANGE! it means 'Check with me before taking action' i.e. you can select whether each occurence should be replaced with the new text or not.

CHANGE will prompt for the replacement text. The rules are: the leading quote character is optional and allows you to enter leading spaces, which are all significant. This allows you to add more space into program text. Trailing spaces are deleted. Therefore, replacement text cannot consist of spaces only.

If you enter <"CR> as replacement text then occurences of <text> will be replaced by nothing (i.e. deleted). While this is a useful facility, allowing you selectively to remove any portion of a program line, it is possible to end up with a program line number which has nothing following it. Normally, this is impossible to program; such a blank line can be removed in the normal way by typing the line number and carriage return. Some examples are:

```
CHANGE " PLAY
CHANGE TO ? " GAME
```

will carry out all changes, displaying first each line containing the word PLAY, then change it and re-display the new line.

```
CHANGE!" PLAY
CHANGE TO ? " GAME
```

will display each matching line, then prompt CHANGE IT ? (Y/N) and wait for your reply. If you reply "Y" then the text will be replaced with your new string and the modified line will be displayed. If you reply "N" to the CHANGE IT prompt, the line will remain unaltered and the search will be resumed.

The break key can be used, as in FIND, to exit the command, but will clear all program variables.

C8. SDEL"text or SDEL!"text

An abbreviation for "S"elective "DEL"ete, this command combines the FIND command with (the option to) delete the whole line containing the text. As with CHANGE, there are two versions:

SDEL"text will immediately delete all lines containing <text>

SDEL!"text will display each line found, as with the FIND command, then prompt with DELETE THIS LINE? (Y/N) and allow you to choose for each occurence.

SDEL will always delete the WHOLE line, so if you just want to delete the actual text found, use the CHANGE command.

As before, variables will be cleared if the break key is used.

C9. COMPRESS X-Y

The COMPRESS command removes all REM statements plus all excess spaces. Literal text (i.e. inside quotes) is not affected.

X-Y specify the start-end lines, as per LIST X-Y, and the forms COMPRESS, COMPRESS X-, COMPRESS -Y and COMPRESS X-Y are all acceptable. Note that strings in DATA statements should be enclosed in quotes to preserve them. This is optional in SA-5510.

You can now design your program for maximum clarity, with spaces and REMs used freely and then use this command to compress the final version to save maximum space. Using COMPRESS followed by RENUM/1,1 will often save you more space than XPATCH uses!

NOTE that, although it's not emphasised in the MZ-80A manual, REM statements may be terminated by a colon e.g.:

```
10 REM THIS IS A REMARK:X=1:GOTO 100:REM ANOTHER REMARK
```

will set X=1 and cause a jump to line 100. The COMPRESS command will, correctly, remove the REMs, together with the correct colons, and leave the X=1:GOTO 100 statements!

C10. XREF X-Y and XREF/P X-Y

The XREF command generates a cross-reference listing on the screen only, while XREF/P also prints it. X and Y are the usual optional start and end line numbers and may occur in all combinations.

All variables are listed in alphabetical order, with their line references in ascending order. User defined functions are not cross-referenced. A line number is only included once, even if the variable occurs several times in the line. Nested variables are handled correctly, so a statement such as X(A,B)=0 would generate cross-references for variables X(,) A and B. In fact, X(Y(A),Z(B))=0 would generate X(,) Y() Z() A B cross-references.

Numeric variables are displayed before string variables and each type is displayed separately in the order arrays..vectors.. scalars. If there are no variables of a particular type a blank line will be left to indicate this. Therefore, if a short program only uses string scalars, there will be several blank lines between the command and the first string reference - this is not an error!

A maximum of 255 references can be stored for any one variable. XREF will issue a warning if there are more than this, and display the first 255 only.

Because the XREF command needs space to generate the reference tables, all program variables are cleared. The XREF listing can be paused with the space bar and the break key will abandon the listing.

SECTION D1 - POKES, USEFUL SUBROUTINES, MEMORY USAGE

FULL STRING COMPARISONS:

To treat upper/lower case as different: POKE$2305,$C9
To Treat upper/lower case as identical: POKE$2305,$FE

DATA TAPE FOUND & LOADING MESSAGES:

FOUND: Disable: POKE$3140,$21:POKE$3141,$F0:POKE$3142,$10
Enable: POKE$3140,$CD:POKE$3141,$0B:POKE$3142,$33
LOADING: Disable: POKE$315B,$00:POKE$315C,$07
Enable: POKE$315B,$6C:POKE$315C,$2F

LIST PAUSE: If you wish to use a key other than the SPACE BAR to hold and step a listing, POKE$3306,<ASCII>, where ASCII is the code of the required key.

LINE X: Normally inhibited unless using Hi-Res. If you want to risk it, you can enable it with POKE$1C16,$E0:POKE$1C17,$58. The results are not predictable!

XREF display spacing:

The TAB spacing for the display can be altered by POKE$57BF,x where x=13+spacing required. There will always be a minimum of one space between line numbers.

FIND/CHANGE/SDEL:

Handling of space characters: If you want to IGNORE all spaces in both the search text and also the program, POKE$53F8,$20. If you want ALL spaces significant in both search text and program, POKE$53F8,$00:POKE$540D,$00:POKE$5413,$00. As supplied $53F8=$00, $540D,$20, $5413,$20, i.e. first blank significant, then ignore the rest.

For the CHANGE! and SDEL! commands the "!" was chosen as it's easy to key in, being next to the quote character. If you want to change it, POKE$5485,<ASCII>. Do not use "?". It will get translated to FINDPRINT and you won't find anything.

USEFUL SUB-ROUTINES:

XPRINT at $57DE will print a character in the A register on both screen and printer.
XMSG at $57ED will print a message (in ASCII ending in 0DH) on both the screen and printer. The start of message address must be in the DE register prior to the call.
XCRLF at $57FC will do a newline on screen and printer.

XPATCH MEMORY USAGE:

The new S.O.F. for BASIC is $5A04. XPATCH uses the following areas: $3302-$335D, $4806-$48FE and $505C-$5A03. If you are not using Hi-Res then normal spare space exists from $4300-$4806. With Hi-Res there's a bit left above $335D. *****

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Library News

Some weeks (or was it MONTHS ?) ago, chatting to a new member about his 'B', I asked which version of BASIC he had obtained with his secondhand machine. 'SB-6510.5E' came the reply! I thought that, by now, I had seen ALL the versions of Sharp Disk Basic which had ever been issued for the MZ-80B; but I asked the member to send me a copy, and this he did by return post.

From one of the programs on the disk, it seems that SB-6510.5E was made for internal use by a French subsidiary of Sharp (SBM); it obviously IS different, since SOME programs on the disk, which run quite happily under .5E, will not run under standard SB-6510. On checking with my trusty Disk Utility, standard SB-6510 and .5E differ from each other from track 8 onwards ...in what way, I haven't had the time to discover, but since the disk comes with one or two VERY useful programs, which I shall now attempt to describe, I've added it to the 'B' Library as (BASIC) disk No. 10.

The first change which you will notice, at boot-up, is that booting ends with an automatic listing of the disk directory, in three columns across the screen, each file being numbered. You may RUN, LOCK, UNLOCK, DELETE or RENAME any file by pressing the highlighted key-letter of the required command, followed by the number of the file from the listing. You may also get hard copy of the special directory display, or CALL a file by number (which clears the screen and displays the filename on its own).

UTILITY-SBM is based on the standard Sharp utility program. It has an improved 'Menu', but it still creates a 'Sub-master' from a 'Master' (to stop this, change $13E3 from $20 to $18).

Filing CMT is the standard Sharp tape-to-disk program.

X-RAY does a graphic presentation of the file allocation table of the current disk. (O.K. but I prefer J. RIHA's program).

DISKFER I find to be the MOST useful program on the disk, since it allows copying of files from one drive to another drive (or to itself if you only have one), and it accepts wildcards; you are given a window into which to type the name of the source program, and when typing-in the filename you may press F1 at any position to represent ANY character, or F2 to represent ANY CHARACTERS from that point onwards (i.e. Pressing F2 at the start of a name means ANY NAME AT ALL!)

I've long moaned about the lack of a CP/M-like 'PIP' command in Sharp Basics, but this comes very close to answering a 'maidens prayer'. I Know that I'm probably preaching to the converted, but most much-used disks have one heck of a lot of space 'locked out' of use, by small files being deleted, and replaced by a larger version of the original, which will NOT, of course, fit into the

space just released. Hence our file allocation table begins to look like a patchwork quilt, rather than a lawn of consecutively used sectors. It is quite common for anything up to 10% of disk space to be AVAILABLE, but not USABLE because of this. Copying over a diskful of files using DISKFER will close up the gaps.

SYSGEN 'Hurray!' I thought, another useful CP/M-like routine. Well, yes, it is, but it doesn't work in EXACTLY the same manner as CP/M! The routine allows you to renew the system tracks of a disk which is ALREADY A MASTER or SUB-MASTER and the Basic version must be the same i.e. you MUST be copying SB-6510 to an SB-6510 DISK. The restrictions are fairly obvious when you think about them. Under CP/M the system tracks are always kept separate from the rest of the disk and they EITHER contain the system OR they are left empty i.e. you can SYSGEN any CP/M disk at any time. The Sharp Basics, however, work differently in that they designate the start of available space as track 11 for a Master or Sub-Master disk and track 3 for a Slave disk, so having once set up a disk as a Slave, you can't alter it without causing havoc, and losing data. I tried to SYSGEN a newly formatted (but totally blank) disk, SYSGEN wasn't having any of it! There ARE a few restrictions here, but nevertheless, a VERY useful program is the outcome, since it enables you to recover most if not all of a master disk in which the Basic tracks have been inadvertently corrupted.

Your copy of SB-6510.5E is available for the usual Disk, return label and postage (don't forget that postage rates have just increased!) to the address at the head of this section.

******

BITS and PIECES (literally!)

Following the Editor's visit to COMPUTER-100, I contacted them asking what parts, if any, they currently held for the MZ-80B. The reply which I received did not list ALL the parts for which I was hoping. Apparently they had little to do with the 'B', their efforts being concentrated upon the 'K' and the 'A', which they sold as complete system/packages for invoicing and accounts purposes. Nevertheless, I list below the items available and the prices being asked:-

MZ-8BP5I printer card (new & boxed)	£20.00 each.
MZ-8BP5I printer card (secondhand)	£10.00 each.
MZ-80FB disk drive belts	£ 5.00 each.
Post and Packing for one card would be	£ 1.85

All prices EXCLUDE VAT which must be added to the total @ 15%

Orders should be sent to:-

COMPUTER 100 Ltd.
85-87 BASINGSTOKE ROAD
READING
Berkshire RG2 0HA (marked for the attention of Mr. David Cleeton)
Or PHONE 0734-753100

Happy computing! John I. *****

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MZ700 News

RESET

Between the last issue and this I have been busy building an extension (study/office/computer room) to my house with the intention of giving young Adam his own bedroom (Would you believe that I slept in a drawer when I was his age). All this has had an effect on my output but we still have plenty so read on. Thanks to Nick Hacking and Chaz Mills especially.

By-the-way, I forgot to give you my tip for the world cup finals. It was: West Germany v Argentina, W. Germany would win.. Honest!!

****

Letters

Better late than never.

I am writing to send you, what would have been my entry for your 1K competition. I don't think it merits judging as it is past the May deadline and the program is a conversion of something written for the BBC.

The next program on the enclosed cassette emulates a technique used on other computers called 'dithering', which can be used to produce more than the normal eight colours. The theory behind this process is that most monitors and television sets are of such a low resolution that when pixels of two different colours are plotted close together, a new colour is formed. I think that this would make a good basis for an article in a future edition.

A listing of the above program:

```
10 A$="":FOR J=1 TO 38:A$=A$+" ":NEXT:FOR B=0 TO 7:FOR F=0 TO 7:
   COLOR,,F,B:PRINT A$:NEXT:NEXT
```

NB. Fill the space between the quotes with the chequered graphic character on the comma key.

David Lodge, Thirsk, N. Yorkshire.

Paul's Piece.

It's a pity about your competition entry but the winner had already been chosen before yours arrived.

If anyone is interested in taking the dithering program a bit further, then lets have some input. My letterbox is always in the WOPEN state..... Thanks David.

Spice of life.

Many thanks for the 1K competition prize and your prompt library service.

I only play such games as chess and backgammon, slow moving! Writing programs fascinates me as a mental exercise. I retired from the civil service 13 years ago this month at 65 so work that out. I find that puzzling how to write a program just nicely supplies a bit of easy going mental exercise. Of course many are useless when finished. Well, at least I think so.

Mr Jack Pepper, Workington, Cumbria.

Paul's bit.

If I get to 78 years old (47 years to go) and using the new technology of that time, I will be pretty pleased with myself. Keep the grey-matter working. Well done Jack.

*****

WDPROblems

I am having problems with the WDPRO 702.34 which I purchased from the club, care of Maurice Hawes who referred me to you because he was not familiar with the MICROBYTE interface that I use with my matrix printer model ACL-135 bought from Solo Software.

After writing text and entering 'print', the printer just feeds the paper through without printing, I am entering the special character (blob) at the end of the text and answer yes to the first two questions. I would be grateful for your help.

Ranjit Singh, Manchester.

Paul's bit.

Although I don't use WDPRO (I prefer Genesis), I did have a look at it when Maurice sent me a curiosity copy. I had a similar problem with my Panasonic KXP-1080 interfaced with the Microbyte and then the Magicbyte. Both were set to ASCII (American Standard Code for Information Interchange). The difference was that I got a printed line before a form feed then the next line, form feed and so on.

It would seem that WDPRO was sending a form feed code (0Ch) to the printer instead of a line feed code (0Ah) at the end of each printed line. Maurice has fixed the bug, so if you haven't already got your fixed version, then do so.

****

Recent upgrades to WDPRO on the MZ-700

WDPRO 702.34 on tape

The short-lived WDPRO 702.34 corrects an obscure 'bug' in WDPRO 702.33, as reported in Vol.10 No.2. The changes ensure that WDPRO 702.34 works correctly when using the ●(prompt) facility described on page 24 of the Manual. WDPRO 702.34 (like 702.33) has only two printer options, and is now superceded by WDPRO 702.35 below.

WDPRO 702.35 on tape

WDPRO 702.35 contains THREE printer options, instead of the two options in 702.34. The third option is for a 'Centronics' printer:

OPTION 1 - for Sharp plotter/printer, with 700 switch set to INT.
OPTION 2 - for Sharp P5/6 with 'K' ROM, 700 switch set to EXT.
OPTION 3 - for a 'Centronics' type standard ASCII printer, with the 700 printer switch set to EXT, and a TRANSPARENT commercial interface (or the PCB modified as detailed on p.8 of Vol.10 No.1).

If you choose OPTION 1 or 2 there are no further questions, as the Sharp printers for which they are intended all do AUTO LF on CR. With these options, WDPRO sends a single 0DH at the end of each line, and this produces a carriage return and a line feed. It is therefore IMPOSSIBLE to do two passes over the same line.

If you choose OPTION 3 there is a further question which asks you if you want to send an LF after every CR. You are advised to set your printer to NO AUTO LF, and answer 'Y' to this question, as WDPRO will then be able to do underlining and double-strike in two passes, using the OU and OE format commands respectively.

Under OPTION 3, WDPRO 702.35 sends standard ASCII codes to the printer. If you use a separate plug-in 'Centronics' interface, it should be set to 'transparent' to stop it converting codes above 5FH all over again. This will also ensure that any control codes sent via the ●X command will remain unchanged, enabling you to control all the printer's special features.

WDPRO 782.36 on tape

WDPRO 782.36 contains all the features of WDPRO 702.35, plus extra code to utilise the SUC 80-column modification. In 'COMMAND' and 'EDIT' modes, WDPRO 782.36 uses alternate columns of the 80-column screen to provide a 40-column display which is easier to read. In the 'SETV' mode, WDPRO 782.36 uses 80 columns to provide a full-width display, so that a document may be previewed without having to scroll sideways. The screen is switched automatically as required; for this reason, SET40 and SET80 are disabled.

WDPRO 782.37D on CP/M disk

WDPRO 782.37D is exactly the same as WDPRO 702.37D, except that it utilises the SUC 80-column modification. It does so in the same way as WDPRO 782.36 above, i.e. SETV gives an 80-columns preview.

NOTE: If you have already paid £6, the latest upgrades are 'free'; just send the Editor a blank tape or disk, and return postage. ***

MZ-80K and MZ-80A PROGRAMS ON THE 700

by Charles (Chaz) Mills

While there is still a large amount of software for the A & K computers, using them on the 700 is not as easy as it first appears.

If you wish to use 80A programs you will require a copy of SA-5510 BASIC or a converter program such as SUPER CONVERTER which I believe are both available from the 700 Software Library.

The use of a converter program will allow you to use the following poke changes with a bit of luck.

MZ-80K programs can be loaded directly into the 700 and it will convert the program on its own, but that is not the end of the matter. The 700 will not change the machine specific pokes for you.

The following list may be of use to you in this matter:

The letter K will be used for the MZ-80K, and the letter S will be used for the 700:-

K 4464 if poked with 1 sets the keyboard to lower case. Poked with 0 restores to upper case.
S use PRINT CHR$(5) or poke 96,67 for lower case.
PRINT CHR$(6) or poke 96,239 to restore to upper case.

K 4465 horizontal cursor position.
S change to poke 84.
K 4466 vertical cursor position.
S change to poke 85 or use the cursor command in both cases.

K 4513 fine sound control. S change to 2617.
K 4514 coarse sound control. S change to 2618.

The following pokes all deal with the break key, as the list is quite large the following pattern of reference will be used:-

K as before, S as before, D disable and R restore.

K	D	R	S	D	R
6636	0	205	1203	201	216
8767	0	218	6452	54	113
8768	0	133	6453	25	32
8769	0	19	8987	23	105
			8988	35	32
			9056	98	105
			9057	35	32

K 10167 if poked with 1, removes the peek protection from BASIC. This can be deleted as it is unnecessary.

The following pokes disable the list & save (see over).

K 10680 poked with 1, disables list and save, poked with 0 to restore.
This can be deleted if not required. If it is required the following pokes are all needed on the 700 to do the same:-

S	D	R
12629	254	2
12630	32	65
16642	201	175
12721	254	164
12722	32	66
17060	201	205

K 17828 peeking this location gives the ASCII code of the last key pressed. S change to 85.

K 53248 to 54247 VRAM (video RAM) addresses for pokes to the screen, these can be left as they are the same on the 700.

K 57347 if poked with 4 changes LED (light emitting diode) on keyboard to red, poke with 5 to restore to green. This can out as it is not needed on the 700.

K 59555 if poked with 0 blanks the video, poke with 1 to restore. S this can be left out, or if you clever poke new display to second video screen and scroll into place.

These changes do not cover all the pokes found in the 80K BASIC, any other pokes should be omitted as they will probably not work or may cause problems when running in S-BASIC.

****

Going 5.25 Floppy by Paul Trainer

As you know from my editorial of the last issue, I was on the look-out for a Sharp dual-drive unit, that wasn't to be, but just before that little saga took place I had swapped a new 700 plotter for a Cumana 5.25 dual-drive which had its own PSU (Power Supply Unit) and had a metre of 34 way ribbon cable with an IBM or BBC plug at the end. I knew it was possible to connect other drives to the 700 but I also new that my technical rating in such things is zero. I am still looking for a Sharp drive but decided to try and get the Cumana working for the experience and as an exercise.

The drive requirements are: SHUGART compatible, 40 track, double-sided and double density. The Cumana drive fits all of these; in addition to being double-density as it has a 40/80 track switch at the rear of each drive.

The next step was to dig out Vol.5 No.1 and read the article on page 47 entitled ALTERNATIVE DRIVES FOR THE 'B' by Chris Handley. All the information in that article applies to the 700 which makes life much simpler.

Certain items had to be acquired before I could proceed, the main thing being a MZ-80A disk interface card. Coincidence played its part as Greg Chapman was selling such a card as advertised in

vol.10 No.1, purchased with haste, thank you Mrs Chapman. The card has all the relevant chips to be used with the 700, only one chip has to be replaced with the MZ-700 F.D. Eprom which is available from our beloved club. This Eprom has K&P (Kersten & Partners) and Sharp 2Z-009E disk monitors on-board, if you want to make use of the latter a small amount of solder-work is needed, otherwise you just plug it in and poke-away.

So far, so good. The next item was a 37 way 'D' connector or should I say plug, I was asking Maplins for connectors (quoting Chris Handley's article), I bought two such connectors, before I realised that 'plug' was the operative word. This snapped onto the ribbon cable like a dream.

I was already armed with disk BASIC so it was just a matter of sliding the disk card into the spare slot in the expansion box as supplied from M & B and plugging the 37 way D plug into the card. Apart from one or two very minor problems, due mainly to my ignorance of dual floppy drives it all worked as if it was fitted by someone who knew what he was doing.

All the above was fitted to my second 700 which I now call my library machine because it now comprises of the dual 5.25 floppies, a quickdisk and a 800 data-recorder, these are all accessed by the TRANS utility when I am copying the library stuff.

Apparently the big problem with using an 80-track drive on a Sharp machine is that the drive lays a much thinner track to the disk because the read/write head is much finer, so problems can occur when those tracks are read by a Sharp drive. As it happens though, Maurice has so far been able to read my disks.

Chris Handley's article finished with a word of warning which I think I should repeat: Connecting alternative drives to your machine is entirely at your own risk and the club or its members cannot be held responsible for any computer malfunction.

Many thanks to Maurice, John, Greg and Fred White for making the floppy connection a much simpler task than it otherwise would have been.

****

Comms Plus! (a new computer communications magazine)

In the spring of this year I sent a letter to New Computer Express asking them if they were going to do a review of William Shatner's Sci-Fi novel, Tekwar. I've always been a Star Trek fan and I wanted to know what the man behind the Captain Slogg character could put into print. My missive was read by Malcolm Arnold, the editor of another magazine called Comms Plus!. Malcolm asked me if I wanted to do the review myself and if it was good enough it would be published in Comms Plus science fiction and fantasy section. It was published and if you would like a copy of the review then send me a large SAE.

If you are into Comms, then COMMS PLUS! is for you. Details:-
3 Bridge Terrace, Morley, Leeds LS27 0EW. Tel. 0532 606128

Hacking the Hardware by Nick Hacking
(Part two of Nick's sub-sub section)

Tape Troubles

The only data-recorder that seems to work consistently and reliably with the 700 is the standard unit: conversely it works very well as a rule, fits neatly to the 700 and has the advantages of motor sense and motor control. Now that M&B are selling units originally destined for the 800 at a very reasonable cost indeed, there can be few people who don't have the built-in data-recorder (or one as a spare, sub-ed.). Since it gives such faithful service it can be a shock when tapes won't load: this is most likely to happen with tapes that were recorded a long time ago or from tapes that were recorded on another machine. Problems can also be encountered with programs that have their own tape routines (WDPRO and Zip BASIC, for example) as opposed to those of the ROM monitor or S-BASIC.

The most likely cause is a dirty play-back head. It is very easy to forget that the data-recorder is built around an audio cassette deck, for it is part of a computer, not a piece of hi-fi. The solution is obvious. If, after playing a head-cleaner, the problem is still there then there are three possible causes: (1) Head alignment, (2) 'Choosy' software and (3) Something more sinister.

Head misalignment is not difficult to alter in principle, but can be very time consuming to put right, especially if you don't have fancy test tapes and an oscilloscope. This is very definitely a case of 'if it ain't broke don't fix it!'. Head misalignment falls into two categories: Major deformity - usually the result of shutting the cassette with the play button depressed and so bashing the heads down... and not quite in-line - which is a result of wear and tear. If the head is bent the only thing for it is to grasp it with your lily white fingers and bend it back. After that you can move on to more delicate tweeking, if necessary.

The less drastic adjustment is done by putting the cassette into 'PLAY' and inserting a miniature cross-head, or jeweller's screwdriver into the small hole on the top of the data-recorder so that it engages the screw underneath. The head has two lugs: the screw holding the right hand lug is inaccessible, while the left hand lug is fixed by the screw under the little hole and is spring loaded. As this screw is tightened or eased the angle the head makes with the tape changes. Often a half or quarter turn of the screw is sufficient to put the head back where you want it. The job is made much easier if you have an 'eavesdropping switch' (or a copy of S-BASIC Compiler which has a similar facility, sub-ed.) otherwise, lift out the data-recorder and shove a wire into the top of the plug, to connect to the 'read' wire. Connect this to one lead of a crystal earpiece and earth the other earpiece lead; the FG terminal on the back of the 700 will do.

Since the original copy S-BASIC that came with your computer is something that everyone will have (not always the case, a lot of second-hand buyers receive no more than the 700, sub-ed.) and as it is the major piece of software designed for the 700, I suggest using this as a standard. Put the tape in the deck, tell the 700 to L (oad) and hit play: if you get an error, turn the adjusting screw a fraction and try again. After a lot of trial and error, it will eventually load: listen to the sound of the tape too, although this will not tell you when you have got the head alignment exactly right, it will give you an idea of when you are wildly off. When the beeping and buzzing noise is loud and clear you must be close to the correct position. It helps to keep a record of the adjustments that have been made, how much of a turn and whether clockwise or anti-clockwise.

When things eventually come right, you could well find that the tapes made on other machines, or even tapes made with your own machine previously will not now load. If this is the case, tweek the adjustment screw further until you find a position that will load the rogue tapes and still load S-BASIC. Be warned, you may have some tapes that were made on other machines that had so different a head alignment that you will never get the computer to recognize them all with the one position setting. If you aren't careful you can end up spending all your time fiddling with the adjustment screw instead of using the computer. This really should be looked on as a last resort.

Connecting the MZ-800 plotter.

It is not difficult to connect the power lead of the 800 plotters (from M&B) to the 700: but a permanent, soldered connection can make transport and storage of the 700 a bit difficult. Fortunately Maplin sell a 2.5mm socket which will take the printer's plug. There is a panel mounting version (JK10L) as well as a flying variant (JK12N). It is reasonable to assume that anyone wanting to connect an external plotter will not have the internal unit fitted, so the blanking box between the PSU and the data-recorder is a likely place to fit the socket. There is room for the socket elsewhere on the back of the 700, but the box has the advantage of being removed far away from the (more vulnerable) processor board for drilling or (heaven forbid!) melting with the tip of a soldering iron!! Some folk, quite reasonably, will not even contemplate making holes at all: they may prefer the alternative flying socket. If the cable to the flying socket is suitably flat it can be squeezed underneath the blanking box and the socket can then dangle at the rear of the 700.

Whichever method is chosen, the outer contact of the socket must be connected to +5v, the inner to 0v: since it is unused, the internal power connector P-5 seems the obvious place to tap into. Pins 1 and 2 are at 5v, 3 and 5 are at 0v. It is actually possible to get away with just one connection, to 5v, since the plotter is grounded through its data bus. I don't recommend though, as the GND pins on the main plug are intended to be used as a signal ground and it is not a good idea to mix signals with power as a rule.

Sub-ed. - I don't think there is a problem regarding the connection of the 800 plotter, even I managed it. Still, it is nice to see some sound advice coming in.
Yes, Maplins do seem to have everything. Thinking I would be laughed at, I asked Maplin if they sold a phono female to 3.5mm mic male, "yes sir, £1.00 please" came the reply, what a company!

****

Bits, Bytes and Nibbles

Does your plotter refuse to work correctly when advancing the paper or whilst you press the advance button?, if so, take a look at the the smallest white plastic wheels/cogs which are on either side of the main roller. If one or both have a lateral split along the toothing, then at least my diagnosis of the problem is correct. To fix it you will need a similar wheel, which in my case was simply a matter of removing one from a completely dead plotter which I kept for spares. As these tiny wheels would probably be hard to come by, then a second solution is needed. The hole in the wheel is very slightly smaller than the bar on which it fits, probably to ensure a firm grip which in turn, along with heat expansion/contraction causes the the wheel to split in the first place. If a 1/6" drill bit is used to re-bore the hole, the bar will not open the split up again. Then a small amount of glue is used to give the wheel its normal grip. Don't try to glue the split, it will not work!!

For further details of this second solution, contact Mr Jack Pepper on 0946 831225 anytime.

Jack also mentioned that whilst searching for the best glue to use, he came across an adhesive by BISON which has an integral metal base and would be an ideal substitute for a soldering iron.

*****

If you are not on Solo's mail-shot list you will not know of their latest offer of the original Quickdisk set-up offered at £95.00. They are also offering a large selection of games software at £2.00 per title, 5 titles minimum.

Roy Houghton our ex-librarian has finally decided disk-up his 700, tempted by the Solo offer, he asked me what the difference was between Solo and M&B set-ups. As I have both I invited Roy up the M1 to take a look for himself. Roy's initial worry was about the space either system would take up. Admittedly the M&B stuff does take up more of your desk space but this small disadvantage is nothing when you think that the M&B stuff allows upto four Floppy drives to be connected to the spare slot in the expansion box or that if you want to use your quickdisk along the same lines as the original set-up, then the club has the PROMs (programmable read only memory) to do it with the further advantage of the M&B Expansion box, 800 disk interface and Quickdisk drive being cheaper than the £95.00 cost of the unexpandable Solo set-up.

I told Roy about Computer 100 and their source of Sharp dual-drives, so I will leave you with your own conclusion as to what system he is after.

By-the-way, the Disk interface which is part of the Solo offer is not the original Sharp model (MZ-1E14) but a rather inferior looking copy, maybe the price reflects this!!!

***

One member told me recently that he gets a bit confused when he sees such things as CP/M and DOS and that the magazine is riddled with examples of such things that he doesn't understand. So, to slightly clarify matters I will bracket such items where I can, I would guess that he is not alone. CP/M (Control Program for Micros) and DOS (Disk Operating System)

***

Another member, namely Bill Hynd, reminded me that when you have accidentally come out of a m/c program which executes at $1200 eg. any of the QD utilities or even BASIC, there's a quicker way to get back to the program than typing 'J1200', which is to hit SHIFT and the 3 key then CR, simple!!

***

Another member has found a couple of additions to the LIST command. Some of you will know that 'LIST.' outputs to the screen the line in which the an error has occurred, but did you know that LIST.- lists from the error line to the end of the program or that LIST-. lists from the first to the error line. I haven't seen this published anywhere so maybe it's a first. Please let me know if it's not a 'newy' as this other member is yours truly.

***

Just before the last issue was released I got a phone call from Bruce Harrison of Liverpool who informed me that by making a fresh copy (using S-BASIC) of any programs that returned a CHECK SUM ERROR when using TRANS would then transfer to disk OK. Thanks Bruce, but as you know I had already worked that one out for myself. This leads me onto Nick Hacking's quite different solution to this problem which will be in the next issue.

****

Library News

Maurice has recently sent me the latest versions of WDPRO, namely 782.36 (80 column) and 702.35 (40 column). The former of the two is for use with the 80 column modification available from your local SHARP USERS CLUB and the latter is for the standard 700. Both now cater for the SHARP matrix, printer/plotter and a standard CENTRONICS. WDPRO is still a 'special request' and is still available from Maurice Hawes, £6-00 plus a blank tape.

Greg Chapman of MZ80A fame has sent me a 700 version of a much improved CLUB COPY. Club Copy.U1 is a tape file copier and will store and copy upto 15 program/data files. Instructions for Club Copy.U1 appear earlier in this issue, alternatively you can request a WDPRO file containing the full instructions, the usual blank tape and SAE to the 700 library.

***

Reynir H. Stefánsson of Iceland has sent a tape containing a handful of programs which are:-

PERIL ON THE SEABED. (Found in Computer Gamer Feb 87). A text adventure which may have a bug or two (I had to change a colour SYNTAX at the start), I would like someone to give it a test-run as I feel it could be a worthy entry.

COLMEM. A RAM memory examiner utility with colours to highlight the various parts of RAM (random access memory). Use the cursor keys to meander, examine and alter S-BASIC at your will.

BIG CLOCK. A very large digital display which takes up half of the screen. Ideal for that second 700 while you are writing SUC articles on the other.

ALARM CLOCK. Again a digital display but this one allows several alarm settings which are held on a user editable DATA line (line 510 to be exact).

EDFIELD. A field editing routine. There's no instructions to this one, maybe Reynir could send me some to clarify the aim.

SCREEN UTILITIES. An adapted PCW screen toolkit. Reynir tells me that this is not quite ready for release. Maybe seeing this will be a subtle prompt. Over to you Reynir!

***

Jack Pepper has been in touch, telling me not to release the QD version of Bingo 6 Card as it runs very slow under that BASIC. I did notice that my own FONTS+ ran faster when tested with S-BASIC after being developed in QD. Bingo does use lots of IF THEN statements and quite a few GOSUBS, maybe QD is not as good as S when handling those lines. Anyway, I set to and trimmed Bingo down by 1264 bytes without altering Jack's structure, then compiled it with S-BASIC Compiler. The result is a very large (blame the compiler) m/c version now in the 700 Library.

As a non-scientific test for the above, I wrote a two line prog. to test any differences between speeds. I tried the following:
```
10 TI$="000000":FORT=1TO500:IFT=250THENPRINT"HALF WAY"
20 USR(62):PRINT"XXX":NEXT:PRINT TI$.
```

KERSTEN & PARTNERS DISC BASIC took 37 seconds, QD BASIC took 38, S-BASIC took 36 and S-BASIC Compiler took 36. Does anyone want to take this further?

Some requestees of library material are still quoting the old index which is now obsolete. Just the name and the type (QD,SB,MC where applicable) will do. Do yourselves a favour and send for the 700 Library catalogue as detailed in the last issue.

****

Competition Latest

Unfortunately no entries for the crossword I set in the last issue have been sent in. I am sure it's not that hard, or maybe you lot don't like crosswords. Anyway I'm leaving it open until the next issue. R.S.V.P.

****

EOF (END of FILE)

Please spare a thought for the people who give-up their time and marriages for the good of all Sharp users. The very least you could do is to renew your membership now.

Have a good Christmas and new year, use your holidays wisely, thinking of articles for the March issue. Also, please spare a thought for people who are less fortunate than yourself, i.e. Spectrum owners especially.

Sharp Users Club - MZ-700 Section - STOP PRESS

An alternative source of Quickdisks

We hear that Northern Cash Registers are having problems getting Quickdisks. Paul Trainer has managed to locate an alternative supply:-

Central Typewriters (Yorkshire) Ltd.
387 Harehills Lane, Leeds, LS9 6AP
Telephone 0532 350476

Their price for 10 disks is £22-00 including VAT and postage. When you contact them, please mention the Sharp Users Club - ED.

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Edited by
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In Weymouth

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How we unravelled the secrets of the MZ-800

Software Manual III was published in September 1990 and contains a lot of information about the MZ-800. I do not have an MZ-800, nor do any of the section editors, so most of the information came from David Want, who seems to be the only member in the U.K. who runs an MZ-800 with 5.25" disks AND a Quickdisk. Without David's help, the MZ-800 section of SMIII would have been pitifully small.

One other source of information was the MZ-800 Service Manual, recently received from Teega. This is a very detailed and useful document, though unfortunately it does lapse into 'Japlish' at a few points. Nevertheless it is highly recommendable if you want to understand how the MZ-800 works - and it is a complicated machine!

During the production of SMIII, it became clear that the general philosophy of the MZ-800 owes much to the MZ-80B - both machines call up an 'Initial Program Loader' at switch-on, and both handle graphics separately from text. For this reason, you cannot PEEK and POKE characters into VRAM, and so the MZ-800, like the MZ-80B, does not have a DISPLAY character set. Also like the MZ-80B, the F.D. boot eprom is on the main PCB, so the disk card does NOT need a boot eprom. All very odd when you are used to the MZ-80K/A/700!

The MZ-800 also demonstrates the death-struggles of Sharp's attempts to 'go it alone' with a special character set, and printers running under a non-standard protocol. On the MZ-800, you can set a couple of DIP switches at the rear of the machine to invert the two non-standard printer signals (STROBE and INIT), and the official software supplied for the machine contains commands to set the software up for a standard 'Centronics' printer.

To invert the two 'rogue' signals, you simply put DIP switches 2 and 3 at the back of the MZ-800 to OFF. To set up an MZ-800 Basic to use a 'Centronics' printer with NO AUTO LF, you use the Basic command INIT "LPT:S2,$0A" (or INIT"LPT:S2,10"). This sets Basic to send standard ASCII codes, and $0A at the end of each line (it IS explained in the Manual if you look hard enough (pages 6-37/8).

These INIT commands were unravelled after SMIII went to press, so my promise on page 21 thereof, that I would write 'Centronics' programs for the MZ-800 Basics, is now superfluous. I did start work on them, but when I found that the printer routines reside partly in ROM at $F400 and above, and already include code to swap Sharp 'ASCII' to standard ASCII and vice versa, I decided that there must already be a command to do the necessary. So I scoured the Manual, studied the INIT options, and then asked David Want to check that they do actually work as intended. And they do!

The 800 Manual does not state how the end-of-line character is to be keyed in - you can use hex or decimal, as shown above (but if your printer does AUTO LF ON CR, you must specify $0D or 13).

One last point. The EOL character is stored at $1092 (e.g. $0A), and the 'printer type' (S0-S3) is stored at $1093 (S0=01, S1=02, S2=04 or S3=08); in other words, by setting the appropriate bit. ***

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Sharp PC-4500 series memory upgrades

A number of members have purchased Sharp PC-4501A computers and find that the standard 256K RAM memory places severe limits on the software that can be used. As DOS takes up some 60K, the user is left with under 200K, which is not enough for a lot of commercial software. One solution is to use public domain/shareware software, much of which is very economical on memory usage.

Some of us obtained details of 4501 memory cards and were thinking of funding their commercial production. But we have now heard from from a firm who tell us that they already produce such cards:-

VO1 to expand the 4501 to 640KB, price £79-95 inc. VAT & carriage
VO2 to expand the 4502 to 640KB, price £69-95 inc. VAT & carriage

Contact Microtel Logic Ltd, 163 Parker Drive, Leicester LE4 0JP, U.K. (Tel. 0533 351224). Prices include RAM chips, and small quantities are ex-stock. SUC members are offered a 10% discount! In case of difficulty, ask for Mr. Stickland, Sales Manager.

Backlight Usage

A tip for 45/4600 series owners; always set your backlight timeout to the minimum (2 minutes). The cost of a replacement backlight is very high (approx £200), and setting the timeout to its minimum value prolongs the life of a backlight by a considerable amount.

New Sharp products

The PC-4700 series computers utilise 3.5" 1.44 MB floppy-disk drives; these computers succeed the 4600 series, and are slightly lighter and more compact, with paper-white LCD screens. The 4702 has twin floppies, the 4721 has a 20MB hard disk and one floppy, and the 4741 has a 40MB hard disk and one floppy.

The PC-6220 Notebook computer has a high specification for such a small machine; 12MHz 80286, 20MB hard disk, and VGA-conmpatible paper-white backlit LCD screen. LAP-LINK and MS-DOS 4.01 are built into ROMs. Weight 2kg, dimensions 279 x 216 x 34 mm. Accessories include an external floppy, and an expansion box.

The PC-8041 and PC-8081 colour LCD computers are portable (mains-powered) rather than laptop. Both have a 20MHz 80386, 256 colours VGA emulation, and a 1.44MB 3.5" drive; the PC-8041 has a 40MB hard disk, and the PC-8081 has an 80MB hard disk. These computers can be used with the colour scanners and printers mentioned below, to give a complete colour publishing system.

The JX-730 colour ink-jet printer has 48 nozzles, and uses a parallel interface. The JX-100 colour scanner is a 200 DPI resolution hand scanner with a window for easy use; it offers 262,144 colour tones, and uses a serial interface. ***

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Transfile PC Plus

One Club member has achieved the technical feat of connecting his Sharp PC-1246 pocket computer to his Spectrum computer, and can send programs from the 1246 to the Spectrum.

If you program the smaller pocket computers a lot, you will know that although they are excellent value, they do have limitations. In particular, the small screen and thermal printing paper make the debugging and maintaining of programs both time-consuming and expensive. A new package is available to overcome these problems.

TRANSFILE PC PLUS is imported & supported by Dolphin Software Ltd. and allows 2-way comms. between a Sharp pocket computer and an IBM-compatible PC/XT/AT computer. I have been involved in translating the package from the original German, and have tried it on my library of Sharp pocket programs and found it excellent. The package works through the PC's parallel printer port and the Sharp 11-pin connector. It allows the transmission of BASIC programs, and binary data files, and also allows you to create or edit files on an integrated text-editor and then send them to the pocket computer. Programs and data are stored on disk in ASCII text format and can be incorporated in documents or edited on your favourite word-processor. The PC printer can be used to print out programs and data on standard computer paper, thus avoiding problems with expensive thermal printouts which fade with time. TRANSFILE supports a wide range of pocket computer models and can also be used in batch file mode for those who wish to upload or download data or programs without getting involved in setting up TRANSFILE. This automated operation makes a pocket computer potentially much more versatile in commercial use, as most firms these days process their data on larger computers, and until now pocket computers could not transmit or receive data directly.

Other versions of TRANSFILE are about to be translated, including one for the new Sharp E500 computer; this, in addition to the standard facilities, allows transmission of graphical data from the E500 as PC image files, and these can be incorporated in most word-processing and desktop publishing packages. TRANSFILE is available in the original German for all Sharp and most Casio pocket computers, and for ATARI and AMIGA desktop computers.

The translated TRANSFILE PC PLUS will be available shortly, with the following specification:-

TRANSFILE PC PLUS links IBM PC/XT/AT computers and Sharp Pocket Computers. It is suitable for the following Sharp computers:-

PC-1150
PC-1245/46/47/48/51
PC-1260/61/62/80/85
PC-1350/60/65
PC-1401/02/03/21/25/30/45/50/60/75

(TRANSFILE specification continued)

TRANSFILE provides safe file transfer in both directions. Data and programs may be saved on disk. Simple operation with keyboard or mouse. Convenient, integrated screen editor. Comprehensive English handbook. Update service, 12-month guarantee. Complete with connecting cable, handbook, and program disk. Available from:-

Dolphin Software ltd, Dolphin House, Priors Hill Road, Aldeburgh, Suffolk IP15 5EP, England (Telephone 0728 454171).

New Sharp Handheld Computer

The Sharp E-500 is meant to replace the PC-1600. Similar in size to the 1600, the E-500 has over 1000 built-in functions for maths, science and engineering (it is interesting to note that the latest Hewlett-Packard machine offers around 1360 such functions). The E-500 has a graphics screen, and built-in programs to produce graphs and diagrams. As well as an 11-pin interface, the E-500 offers a serial port which can be configured from the built-in BASIC. The E-500 is aimed at scientists and engineers who will be able to take advantage of its built-in functions.

Sharp Organisers: New machines & Mail order

Sharp have produced the EL Memo Master and ZQ models to complement the IQ range at lower prices. All have data transfer capabilities with one another, which is a great idea and is done with a simple cable. The range starts with a capacity of 8kB, and ends with the ZQ-5200 which has 64kB and a PC-Link facility. All have built-in telephone and address directories, schedule, calendar and calculator. The data communications facilities make the machines much more versatile, particularly the larger-capacity machines, as most users will want to transfer or back-up their data.

Fletcher-Worthington Ltd. have started a mail-order service which offers software and hardware, with new products news, to Sharp IQ users. They may be contacted at Progress House, Cecil Road, Hale, Altrincham, Cheshire WA15 9PB, England (Tel. 061 928 8928).

Listings and PD Software

Articles for these pages are always welcome. If you would like to send me programs for the Club Library I can now accept them on tape for almost any pocket computer. Using my copy of TRANSFILE I can upload them and merge them directly onto these pages, or print them independently. This will avoid typing errors, and also save wear on my fingers!

If you want to transfer any of your (non-commercial) programs from one machine to another, and cannot manage it with standard Sharp equipment, do let me know; I may be able to help using TRANSFILE.

Sharp pocket computers are very popular in Germany, and Dolphin Software Ltd. have 4 x 360kB disks of public domain software available, but all the text is in German. Can anyone help ?

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Edited by
Maurice Hawes Tel. 0305 783518
In Weymouth

Getting to grips with the Sharp MZ-5600

Since the last Magazine was published, Paul Trainer and I have both acquired Sharp MZ-5600 computers, and we are slowly getting to grips with the idiosyncracies of this powerful machine. It was marketed in 1984 (and reviewed in PCW November'84 pp.152-158).

The machine was produced around the time that no-one had quite decided whether MS-DOS or CP/M would win the day, and was supplied with TWO operating systems - special Sharp versions of MS-DOS 2.11 and CP/M-86 v1.1. It looks as if Sharp were putting their money on CP/M-86 at that time, because the Basic supplied with the machine runs under that system, and Sharp's CP/M-86 contains a facility for reconfiguring a 5.25" disk drive in IBM CP/M-86 format.

There were 6 different models available; the MZ-5631 (ONE 5.25" 640/720K F.D. drive); the MZ-5641 (TWO 5.25" 640/720K drives); and the MZ-5645 (ONE 5.25" 640/720K drive and a 10MB H.D.). All three of these machines had 256K RAM, though they could be upgraded to 512K. The MZ-5631A, MZ-5641A, and MZ-5645A were the same as the above, except that 512K RAM was already fitted as standard.

All six machines are fitted with very nice keyboards, very close to AT-style, and have a 'key select' feature which, on the U.K. models, enables 'SHIFT + 3' to be set to 'pound sterling' or 'hash' as required. All machines can have mono or coloured VDU's, and are fitted with a parallel printer port, two RS-232 ports, 3-channel sound with an output socket, and a RESET button.

On the CP/M side, Sharp's CP/M-86 (2Z-038A/E2) formats disks to 640K and comes complete with an extensive Basic (2Z-038B/E2); the Sharp serial numbers seem to date this software somewhere between MZ-700 disk Basic 2Z-009E, and MZ-800 disk Basic 2Z-046. MZ-5600 Basic has some powerful graphics commands and can play 3-channel sound; but the machine is not as clever as the MZ-800 - it cannot play 3-channel music and do other things simultaneously.

Sharp MS-DOS (2Z-036E2) formats disks to 720K but is otherwise somewhat disappointing, mainly because it is NOT IBM COMPATIBLE. Paul Trainer and I have both tried numerous PC programs which purport to run 'under MS-DOS 2.11 and later'; most of them will not run on the MZ-5600 version of MS-DOS. At the moment we do not know the reason, but we suspect that it may be connected with the non-standard graphics system used by Sharp. A few programs (such as WORDSTAR) do run O.K., but they all seem to be text-based. In general, it seems that a program with fancy pull-down menus will NOT run on the MZ-5600.

The parallel printer port uses a non-standard cable, but the Service Manuals (available from Teega Agencies, see elsewhere in this Magazine) include a detailed diagram of the cable required, and my machine can now run any standard 'Centronics'-type printer.

To summarise, the MZ-5600 is an interesting machine with a super keyboard and useful disk capacity; but there is little software for it, and until we can remedy this, we must reserve judgement.

SHARP USERS
CLUB