

# Einstein Magazine

**& ALL MICRO NEWS**

**Number 88**

Published for users of Einstein (and other) computers  
by RPM Society.

Publisher and Secretary:-

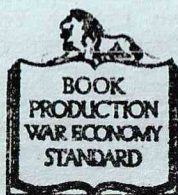
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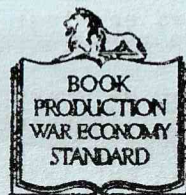
EDITOR: Ted Cawkwell

9 King Street Winterton N.Lincs DN15 9RN

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THE PAPER AND BINDING OF  
THIS BOOK CONFORM TO THE  
AUTHORIZED ECONOMY STANDARDS



THE TYPOGRAPHY OF THIS BOOK  
CONFORMS TO THE  
AUTHORISED ECONOMY STANDARD

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## ADVERTS

John Marriott has two monitor/computer terminals with  
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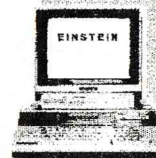
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Hello to all of you who support the Einstein. Sometimes it feels as though I am all alone in trying to keep things going, but although this feeling is something we all feel at times, the truth is that there are lots of people out there with their own ideas and their own way of doing things. This year I've tried to make the Einstein point of contact more rounded by including some other bits and bobs besides the obvious. To this end I brought along my Amstrad 6128 and a music program from France called BLIP from System D. As the sound chip is the same as our Einstein one I hoped to interest someone in doing a conversion job ....

Whilst on the chip front, you probably know that Einey uses the Intel/Zilog Z80 chip, as do many other home computers; mostly inferior, but all have their own various merits. The eight bits in a byte puts us in a very significant position in computing history as the first really usable home computer. To celebrate this there is now a body dedicated to the eight bit fraternity. Not to any particular computer, but to the whole family. It is THE INDEPENDENT EIGHT BIT ASSOCIATION (known for short as IEBA). This has been running for a few years now and is a meeting of minds to provide sources and support for all eight bit machines. There is a lifetime membership of five pounds. This is very good value, as when you need a source for something you really need it. The contact is Brian Watson. For more info send a A4 stamped self addressed envelope with a covering letter to Harrowden, 39 High St, Sutton-in-the-Isle, ELY, Cambridge. CB6 2RA.

It takes a lot of work to prepare for a show, not least getting up at five thirty in the morning. There are no assistants to help so I have to twist John's arm. He isn't an Einsteinian but is a good chap to give us support and cover the stall so I can get a look round. I won't go into detail, as you've heard the tale of woe before. Suffice to say I scored a full house on the brewing up front. Every time I do the stand and display the Einstein I'm pleased to meet people. Some are getting used to me now, after several appearances, and some pull my leg "don't they Chucky Egg". I like to hear why people still support the Einstein, some because they still use it weekly, some out of loyalty to the machine that first captured their interest in computers and the odd ones that like to experiment in controlling computers to do as they wish pushing the boundary of eight bit technology. However or whatever you keep on supporting the Einstein, let me assure you I appreciate your continued support and patience at our efforts to keep at least one lifeline open for the Einstein and a supply of software, help and advice along with technical information.

(Report continues on back inner cover)



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You may have noticed that Tony is back- and up to his tricks, as usual. The train on last issue cover was not intended for release and Tony failed to mention that it was an EINSTein FULL COLOUR PRINT! A first for the Einstein I believe. The latest Puffer has coupling rods, buffers, and steam and sparks coming from the chimney, plus a sky and field background. It should be ready for Tony's first colour cover issue! How it was done will be revealed in a future issue.



## **An Introduction to Machine Code Graphics.**

*by Dave Salvage.*

During the course of writing "Music Workshop" many years ago, I learned a lot about Einstein's music and graphics capabilities. After the launch of the program, I started on an upgrade, converting and modifying the program to machine code. Unfortunately, time pressures did not allow me to finish the upgrade then, and although things are a little easier now, I cannot envisage finishing the project unassisted. However, I can share some of the techniques I taught myself during the period of partial upgrading.

I shall start by introducing a few simple machine code routines which allow the manipulation of graphics and then move on to using interrupts and other more complex machine code applications.

For this first article, I shall go through a simple routine to allow a text character to be positioned anywhere on the screen, disregarding the positions dictated by the standard 40 and 32 column text screen formats.

Here is a simple BASIC program (System 5) to illustrate its use.

10 REM PRINTS TEXT AT ANY GRAPHICS POSITION

20 CLEAR &E000:REM CLEARS MEMORY FOR MACHINE CODE ROUTINE

30 LOAD"TEXTGR.OBJ":REM LOADS MACHINE CODE ROUTINE WHERE MEMORY CLEARED (&E000). MUST BE ON DISC 0!

40 BCOL1:CLS32

50 INPUT"ENTER CO-ORDINATES (X,Y) ";X,Y

60 POKE &E800,X,0,Y,0:REM PUTS GRAPHICS COORDINATES INTO MEMORY FOR MACHINE CODE ROUTINE

70 TCOL13,0:GCOL6,0:CLS

80 PRINT"ENTER CHARACTER ";

90 CALL &E000:REM CALLS MACHINE CODE ROUTINE

100 I=INCH:GOTO40:REM WAITS FOR ANY KEYBOARD

## **INPUT BEFORE RUNNING PROGRAM AGAIN**

The machine code listing is as follows:

```
CF 9C FE 20 FA 00 E0 6F
26 00 29 29 29 11 00 18
19 FD 2A 02 E8 06 08 C5
E5 C1 CF C2 DD 2A 00 E8
06 08 07 F5 D4 38 E0 F1
F5 DC 3D E0 F1 DD 23 10
F1 23 FD 2B C1 10 E0 C9
3E 00 CF C4 C9 3E 01 CF
C4 C9
```

The machine code was written using the Glentop Assembler Language and a listing and explanation follow:

10 ORG &E000

20 GET: RST 8

30 DEFB &9C

40 CP &20

50 JP M,GET:

60 LD L,A

70 LD H,0

80 ADD HL,HL

90 ADD HL,HL

100 ADD HL,HL

110 LD DE,6144

120 ADD HL,DE

130 LD IY,(&E802)

140 LD B,8

150 CHAR: PUSH BC

160 PUSH HL

170 POP BC

180 RST 8

190 DEFB &C2

195 LD IX,(&E800)

200 LD B,8

210 BYTE: RLCA

220 PUSH AF

230 CALL NC,OFF:

240 POP AF

250 PUSH AF

260 CALL C,ON:

270 POP AF

275 INC IX

280 DJNZ BYTE:

290 INC HL

300 DEC IY

310 POP BC

320 DJNZ CHAR:

330 RET

340 OFF: LD A,0

350 RST 8

360 DEFB &C4

370 RET

380 ON: LD A,1

390 RST 8

400 DEFB &C4

410 RET

Line 10 sets the origin of the machine code program to allow the rest of the program to calculate the correct addresses for jumps, data reads, etc. This should corre-



spond to the area set aside in the BASIC program for the machine code routine.

Lines 20 to 50 "get" the character to be printed from the keyboard input using a subroutine in the MOS of Einstein. These are called by using reset 8 and then the appropriate subroutine number, in this case Hex 9C. If the character "got" is less than &20 (Hexadecimal 20 = 32) then the program does not accept the input and awaits another one. Values less than &20 from the keyboard represent control characters and other non-text inputs (see appendix D in "An Introduction to Einstein"). The character "got" from the keyboard is held in register A, the accumulator, the most important register in the central processing unit (CPU). It is eight bits, and therefore one byte, in size.

Lines 60 to 120 calculate the VRAM address of the first byte of the eight bytes which make up the selected character in the Pattern Name Table (Appendix D "BASIC Reference Manual"). This address is held in the HL register pair (two registers of one byte each).

**HINT 1** Adding the HL register pair to itself three times is an efficient way to multiply by eight.

Line 130 loads the IY register with the Y coordinate from memory locations &E802 and &E803, as stored by the BASIC program line 60.

Line 140 initialises the B register to count the eight bits in the byte currently held in the HL register pair. This is the only register which can be used with DJNZ (decrease and jump if not zero). The B register can only count a maximum of 256 (one byte), and the associated jump cannot be more than 126 bytes backwards and 129 bytes forwards, the number of bytes to be jumped being contained in one byte of data in two's complement format.

How can you get a single register (8 bits) to count down from 256? Surely it should be 255, with all bits set to 1?

**HINT 2** By setting register B to zero at the beginning, the first decrement will make it 255 (and therefore not zero!) and thus allow a further 255 cycles to be completed, making 256 in all.

What is two's complement format? Positive numbers are represented as usual, but negative numbers are represented as the inverse of the positive number plus one. This results in bit 7 (the highest bit of the byte) being 0 for positive numbers and 1 for negative numbers, but there are then only 7 bits left for the number itself, ie 127. The precise mathematics of two's complement result in a maximum forward jump of 127 and a maximum backward jump of 128 from the position at the end of the instruction (+129 and -126 from the beginning of the instruction).

Line 150 saves the counter (register B) to the stack.

Lines 160 to 170 put the contents of registers HL into BC. This allows the byte of data at that address to be read from VRAM using one of the machine code routines within Einstein's MOS.

Lines 180 to 190 call this routine using RST 8 and then defining the routine number DEFB &C2. Listings of these machine code routines are available in several manuals, including the Glentop Assembler Language manual.

Line 195 loads the IX register with the contents of memory locations &E800 and &E801, as loaded from the BASIC program line 60.

The IX and IY register pairs are used specifically for graphics-related machine code routines.

Line 200 loads the counter register B to count the bits in the byte to be drawn to the screen.

Line 210 labels the start of loop BYTE and rotates the accumulator (register A) containing the first byte of the character to be drawn (from lines 180 and 190) to the left placing the highest bit into the lowest bit, and the CARRY flag.

Line 220 saves the accumulator and flag register F on the stack.

Line 230 calls subroutine OFF if the CARRY flag has not been set by the rotate manoeuvre (ie. the first bit of the byte to be drawn is 0).

The accumulator and flag register are withdrawn from the stack in line 240, and saved again in line 250. This is



to ensure that the status of the accumulator and flag register is the same as in line 230 since it may have been altered by other instructions.

Line 260 calls subroutine ON if the CARRY flag was set by the rotate manoeuvre (ie. the first bit of the byte to be drawn is 1).

The accumulator and flag register are again withdrawn from the stack in line 270 so that the value in the accumulator is the same as at the end of line 210 ready for the next rotate manoeuvre.

The IX register is increased in line 275 in order to increase the X coordinate by one for the next drawing position.

Line 280 decreases the counter (register B) by one and loops to BYTE (line 210) where the accumulator is rotated to the left again to place the value of the next bit of the character byte into the CARRY flag and so on until the counter reaches zero (ie. all eight bits of the first character byte have been drawn, or not).

When the counter reaches zero, the program continues with line 290 which increases the value in the HL register pair (the address of the character byte in VRAM) by one.

Line 300 reduces the Y coordinate held in the IY register ready for drawing the next byte of the character.

Line 310 unstacks the counter for the number of bytes in the character. This is reduced by one in line 320, and if not zero loops to CHAR at line 150. If this counter is zero, it means that all eight bytes of the character have been drawn, and the program returns to the calling BASIC program at line 100 in line 330 of the Assembler program.

Lines 340 to 370 are subroutine OFF for not plotting the bit if the CARRY flag is zero. The accumulator is loaded with zero, and machine code routine &C4 is called to "plot" nothing. Lines 380 to 410 are subroutine ON to plot the bit if the CARRY flag is one. The accumulator is loaded with one, and machine code routine &C4 is called to plot the bit on the screen.

That completes the breakdown of the assembler program. Of course, it is possible to redefine the text pattern table

at the start of a program, and hence, using this routine, draw any shape defined as a "character" at any position on the screen. If anyone has any difficulties with this or subsequent articles, you may well not be the only one, so please feel free to write to the magazine, and I shall try to answer.



## 💣\*THE BOMB 2. FITTING THE DRIVE.

Having obtained your 3.5" drive you will be itching to get it going (if you are anything like me!).

Don't be in a mad rush. It is not a difficult job but it may not be an absolute cinch. In particular, I implore you, do not open your Einstein and balance the drive on one corner of the box, or on top of the power supply. Drives are heavy enough to do a lot of damage to the motherboard if they fall on to it. Resistors and capacitors are fairly fragile and diodes are made of glass! You will of course, have Albert disconnected from any electricity supply? Good. Read right through this article before doing anything else.

### WHERE TO MOUNT IT

Consider first where you want to mount it. The choice may depend on what you have obtained:

A. A complete unit with built-in power supply and fitted with the 34 pin lead and plug. This is the easy one, the 34 pin plug goes in the socket at the left rear of the machine with the marked lead (coloured stripe) to the left (as you look at the keyboard). There may be a projection on the plug so that it will only fit one way. Then plug the power lead into a mains socket and the job is done.

B. If you have a "bare" drive then you have a choice of the righthand 3" drive bay or mounting the drive in a separate box. The drive is too wide to fit the lefthand drive bay because the Power and Alpha Lock LEDs get in



the way.

1. Mounting in the drive bay is quite a performance, involving much dismantling and bending or cutting the brackets designed for the 3" drive and filling the apertures left because the drive is thinner than the 3" one. However, there was an article about this in EM 72 p11 and follow-ups in EM 84 pp 6 and 21, and EM 85 p 20.

For this article I am going to recommend option 2.

2. Making, or buying, a box to fit the drive with room for another and placing it between the micro and monitor. If you have a bare minimum of woodworking tools it is not difficult to assemble a box from plywood which looks quite neat when in place. The shapes and sizes of the few bits required are shown in the diagram (pages 10/11 Fig.2). I painted mine with ICI DULUX acrylic paint in a "buttermilk" shade to match the micro and monitor, though some TC01s are more of a grey colour. Acrylic is water based, glossy, quick drying and odourless, but more expensive than ordinary paint. Your choice!

The bought box is the Epson disk drive unit (Fig.3) from Greenweld 27 Park Rd. Southampton SO15 3UQ at #12 for the brand new unit. The box contains one new 720k drive with unfortunately, no power supply socket, so we can't use it. This problem may be solved one day but in the meantime a TEAC or Citizen etc. will fit nicely in its place. The internal PCB, which was intended to interface the drive with an Epson laptop, may be removed or just disconnected, as you will. It is quite easy to take apart and manipulate. The large catches for attaching to the Epson laptop can be left off. It is a splendid box, matching the grey Einsteins nicely, and has room for an additional 3.5" drive next to the fitted one. It is about the same size as the wooden box but half an inch thicker.

I have always assumed that the NEC FD1036A was the same as the TEAC drives but having recently obtained one I find that it is 1/8th. inch thicker, so it will not fit in the Epson box and a wooden box will need to be 1/8th.inch higher. Also it appears to use fixing screws with a different thread, perhaps 2mm. rather than 6 BA. The drive select is 0 to 3 using 6 pins and a jumper.

## WHAT DRIVE?

What drive you want it to operate as will depend on what you already have. If you have just one 3" drive, 1/B is the obvious option. If you have two drives with 1/B already occupied then drive 2/C is the choice, and if you have a 5 inch drive on 2/C then you are stuck with 3/D for the 3.5" unless you think it good policy to remove a 3" drive for later use when the other one goes for a burton, etc.

Your new drive, being intended for a PC most likely, will probably be set for drive select 1/B. If you look carefully at the drive you should see either a set of pins with a 'jumper' (a small black plastic box with a pair of lengthwise holes which goes over the pins selected), or it may be a tiny switch. The switch on the Citizen drive I have is about 3mm long by two deep and the little slider almost needs a microscope. The guide to the two positions of this switch are on the BACK of the PCB to which the switch is fixed. It was a few DAYS before I spotted it! Figure 1 of the illustrations give an idea what to look for. The other switch shown is recessed into the side of a Sony drive. Of course, only ONE sort of switch will be present. To add to the confusion there are all sorts of ways of indicating what position does what. The commonest is probably D0,D1,D2,etc but this may be D1 to D4 or just 1 to 4 or 0 to 3! The TEAC drive has just two options D0 and D1 at first sight, but if you look at the PCB just behind the power socket there are three holes in a line with D2 at one end and D3 at the other. These are indeed extra unused positions for the other two drives. There is room for a set of three pins to accommodate the jumper removed from the other, 0 & 1 positions if you have a fine soldering iron and a lot of nerve. Other drives give no option at all, you get drive 1/B and that is it. In all cases the position you want is the next one up from 0 or 1. Don't worry though, there are ways of twisting part of the 34 way ribbon to accommodate any drive you want. Incidentally, the 3" drives also have jumpers internally to select one of the four possible drives, so you can put your 3.5 on drive 1/B and reset the 3" drive to 2/C or 3/D if



Fig. 1

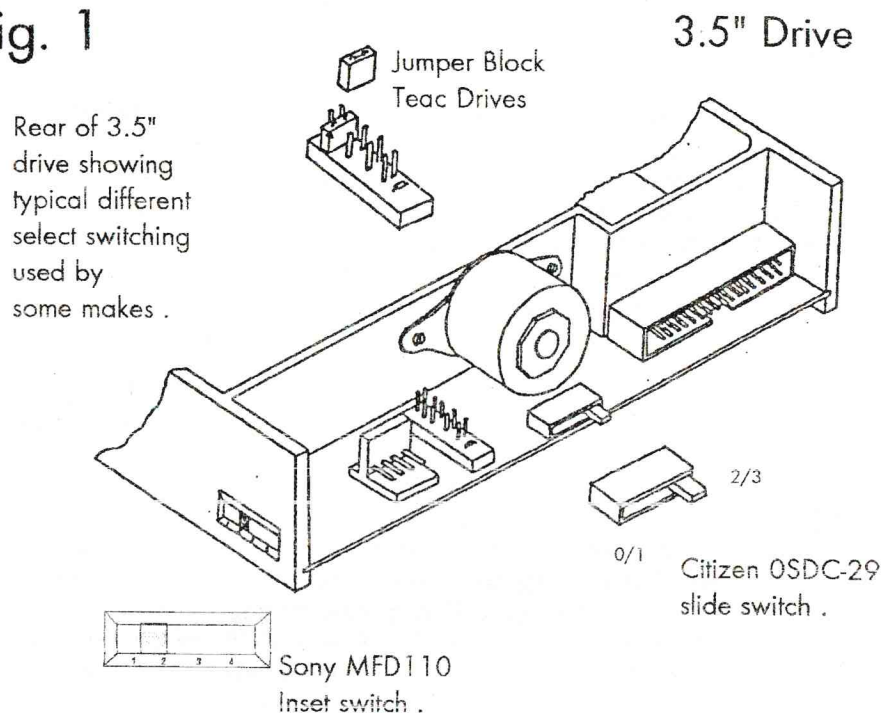
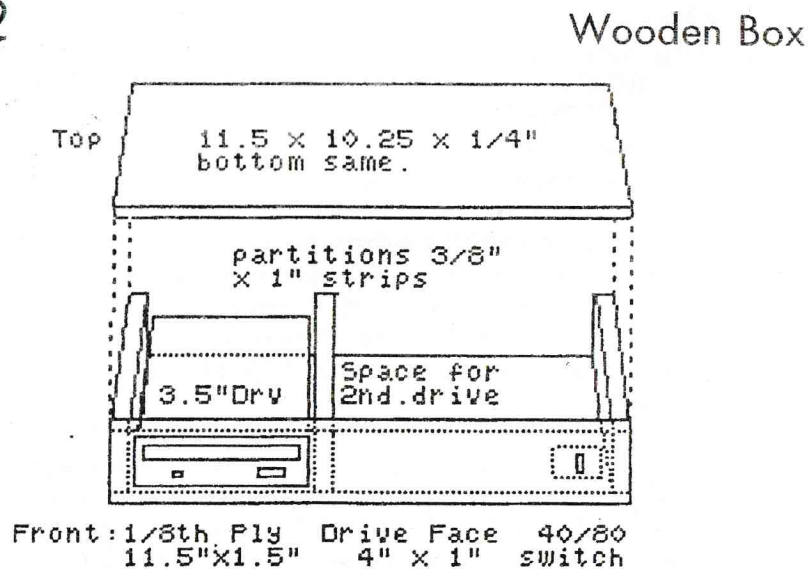


Fig. 2



Twisted FDC

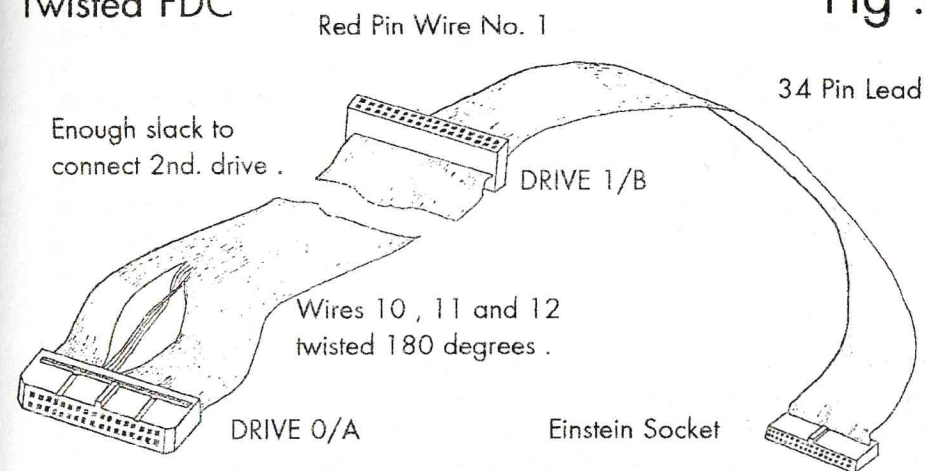


Fig. 5

Y Power Connector

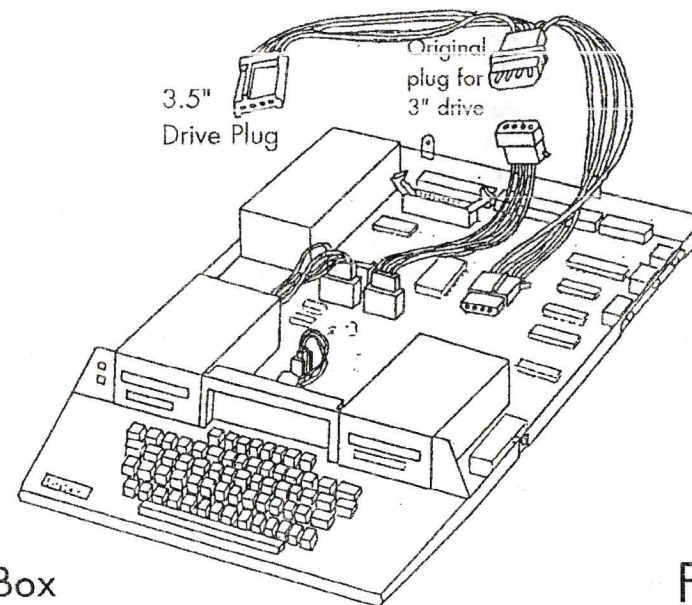


Fig. 4

Epson Box

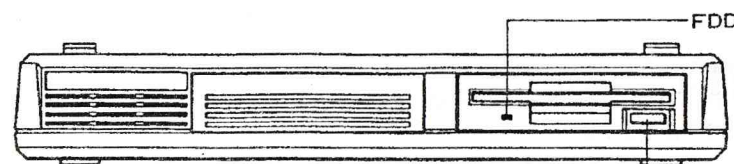


Fig. 3



you wish. Even if you have no way of finding which drive is set you can work it out later when you find two drives operating together. If this happens it should not harm your machine, but it is wise to avoid it if you can.

It is quite important to understand what is involved because the day will come when you need to make a 3.5" drive 0/A, this is what the entire exercise is about!

## MAKING AND FITTING THE CABLES

This will involve removing the top of your machine. There are two screws at the back and with these out the top lifts and slides slightly backwards to remove. More detail in the Introduction to Einstein Manual Appendix 1 and in previous EMs. If you have an 80 column card fitted it can be hinged back and layed flat. Don't lose the screws and spacers.

There are two cables to fit, one for the power to the drive and one for the signals to the electronics of the drive.

1. The power cable. 3.5" drives use a small 4 pin plug and socket. This is unlike all other bits of a PC which use a large 4 pin plug and socket, the same fitting as Alberts 3" drives. To add to the difficulties the power socket on the Ein PCB is a different large 4 pin fitting! The problem is solved by using PC adapter leads which are easily available, often called Y power leads. There are two types and one of each are needed. One type has a large socket connected to a large and a small plug in parallel, and the other has a small socket connected to two small plugs in parallel. The 'proper' price of these from electronic dealers is about 90p each, but if you go to your friendly local computer store you will find that he wants a rather unfriendly #3 - #4 each! Also if you use a mail order outlet they will charge an extra #5 to rush them to you by the next day. Your best bet is to use the walking fingers and buy from the cheapest place unless you are lucky to have a local dealer with reasonable prices.

Having obtained the necessary leads (and you may need two of the small plug/socket type to reach your drive-box), proceed as follows (Fig.4):

1 Disconnect one - it doesn't matter which) - of your 3"

drive leads **AT THE DRIVE**. Leave the other end in the PCB socket. Connect to the free plug the socket part of the large/small lead. By the way, plugs have **HOLLOW** pins and sockets have **SOLID** pins. Remember this and you won't go wrong.

2 You now have a lead ending in one large and one small plug. Connect the large plug to the 3" drive you disconnected in the first place and, to the small plug, connect the socket end of the adapter with all small fittings.

3 The lead now ends with two plugs for 3.5" drives. If it is not long enough to reach to the back of the Einstein and emerge from the same hole as the mains cable, then fit a second small Y fitting to it and coil up the unused small plug and leave it in the Einstein, it has no bare metal bits and should be quite safe. The remaining two plugs should now reach your drive or drives.

## THE ELECTRONICS CABLE

It is easiest to explain this if the new drive is to be 0/A or 1/B so I shall proceed as if that is the case. Details of other configurations later. A lead is made up of a length of 34 way ribbon cable and three IDC (Insulation Displacement Connectors) to connect the micro to two drives. Maplins catalogue has all the bits at reasonable prices and some madeup cables at rather more expense. Check the plugs in the sockets they are intended for to see if there is only one right way - some may fit any way up. The Ein sockets have a slot for a key on the plug, some drives do, some don't. Not all plugs have a key. It makes sense to look ahead to the day when the only drives are 3.5" and install a cable with all the necessary plugs on it. For a drive SET to drive select 1/B a single cable with two plugs for drives 0 and 1 and one plug for the Einstein external drive socket is all that is needed. The tricky bit is putting a twist in the cable so that a drive placed after the twist is 0 and before the twist is drive 1. Do not try to use a PC twisted lead - it has the wrong bit twisted - though it would be OK for drive select 1/B.

As you should now have your drive connected to power and the lid back on the Ein and the drivebox on top, you



should be able to estimate the length of cable needed. As a guide, about 10-12 inches will just about stretch from the rear drive socket to a drive on top of the micro. Looking to the future I suggest a further 10 inches should be left after the first drive plug to accomodate the twist and a plug for the second drive which will be Drive 0/A. if it is not intended to use this NOW it can be stowed in the box for future use. As you already have a spare power plug, it will just be a plug in and go job when your last 3" drive gives up the ghost. The illustration Fig.5 shows the setup. If you are going to put the twist in the cable to use drive 0 then it must be done before the last plug is installed. Take the end of the ribbon cable furthest from the plug which is to go into the computer's socket and lay it on a piece of card or wood and, using a sharp blade cut a lengthwise slit about 3" long between wires 9 and 10. Cut right to the end of the ribbon. Do the same between wires 12 and 13. Lift the block of 3 wires and twist it 180degrees so that wires 10 and 12 change places. Lay it back into the slot in the cable and fix with a piece of sticky tape, making sure there is room beyond the tape to fit the third plug. Fitting the IDC plugs to the cable is not really difficult, but you do need a small vice - don't try to do it with pliers. I use a small modellers vice which clamps to a table. the jaws are only 1 and 3/8ths inches long, shorter than the plug, which means more care is needed to avoid cracking the clamping bar, by putting too much pressure on one half. The clamping bar is a sort of U shape with ridges on the inside surface and there may be a further bar to secure the ribbon.

Remove the extra bar if present and lay the U bit on the bench legs up. Now align the ribbon cable along the ridges with the RED marked wire to the correct end if there is a registration pip on the top of the plug, otherwise it won't matter. Take extra care if you have a bit of twisted lead to align. Then take the main plug body and line it up with the clips at the ends and press it down into position until it grips the cable and you can pick it up and look into the side to check that the wires fit into the grooves.

When you are happy with it place it between the vice jaws and tighten A LITTLE. Move the plug along and

repeat, squeezing a bit at a time until the end clips click into the locked position. (You can usually hear them). Fold the cable over and add the extra bar if necessary. I have never had trouble with this procedure, it is just a matter of taking care that everything is lined up correctly.

The idea behind twisting parts of the lead is to direct the signals from the Einstein, D0 pin 10, D1 pin 12, D2 pin 14 and D3 pin 6 to the correct pin on the drive which, for a drive set for 1/B, is pin 12. To make the drive respond to a 2/C signal twist leads 12,13 and 14. Drive 3/D is more tricky and the best way is to separate wires 6 and 12 and cross them over, pressing the wires into the gap left by the other wire.

Now you can connect it all up. Finding pin 1 of the 34 pin socket on the drive may be tricky. Pin 1 usually seems to be right next to the power socket but there are exceptions. There should be some indication on the PCB, 1 and 2 or 33 and 34 may be printed near one end of the socket.

Booting up as normal and then selecting drive 1 should light the LED and turn the disk motor. Slide in a DD disk and try to format it with whatever system is in use. For best results you will need to configure the drive as 80 track double-sided. All this and the choice of DOS systems will be in the next issue.



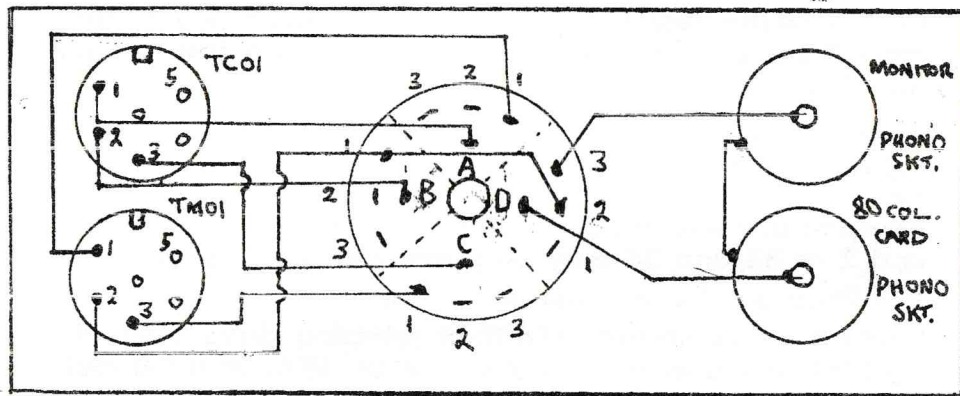
## A Cheap and Useful Monitor Switch

This idea was suggested by Stan Gibbs. When he wanted to make a switch he looked up a previous article in EM but when he started to assemble the bits and pieces he discovered that the recommended 4 pole changeover switch cost over £3 which he found a bit expensive. Looking around he settled on a rotary switch costing only £1 which was a four pole three way type. (Maplin FF76H)

As he had an extra position for each pole he was able to wire it so that he could switch his TM01 colour monitor for 40 or 80 columns and also switch in a dedicated Hi Res monochrome monitor as well.



Rotary switches look complicated but are in fact quite easy to use. Looking at the back of the switch there are four solder tags close to the spindle and a further 12 tags around the outer edge. The outer tags are connected to the opposing inner tags as the switch is turned. Taking them in batches of three, the righthand tag is the first contact, the middle is the second contact and the leftmost is the third contact.



The diagram shows the back of the switch and sockets. There are two 6 pin DIN sockets, one for the colour monitor and one for the output from the back of the computer. There are also two phono sockets, one for the 80 column card output and one for a separate mono monitor. The separate mono monitor is useful when the best definition is required. I use the colour monitor in 80 column mode for all my word processing but I know that some users find the clarity less than ideal, and would prefer a high definition VDU. With this switch you can have both plugged in all the time and click the switch from one to the other.

In the diagram, I have labelled the four sections of the switch A, B, C and D and numbered the other contacts 1 to 3 for each section. The output from the micro goes via the 6pin DIN to the inner tag of A, B and C. Pin 1 to A is the V output, pin 2 to B is the Y+synchs and pin 3 to C is the U component. So, with the switch in position 1 the colour monitor is in circuit.

The D section switches the 80column card to the colour monitor when in position 2, note that tag B1 is connected across the switch to tag D2, this directs Y+synchs to the monitor.

Finally, tag D3 goes to the phono socket for the additional mono monitor.

The rotary switch is small enough to fit in the homemade drive box discussed elsewhere or it could be fitted into a separate box with all the sockets on the back.

One further thing; the ground connections of all the sockets, pin5 of the DINs and outside tag of the phono sockets should all be taken to a common point. A solder tag somewhere convenient in the box would suffice. You may find you can get away without doing this but if there is any problem with the VDUs this should be your first try at clearing it.

#### Parts List (Maplin)

HH36 2xDIN sockets 6 pin.

YW06 2xChassis mounting Phono sockets

FF76 1x4pole 3way rotary switch

FK74 1xPlastic box 102 x 76 x 38mm.

Cost about £5 (June 98)



#### DOGFIGHT - A Game by David Williams and Mike Smallman.

Your Editor, being an ex RAF Lancaster gunner, is inevitably drawn to shooting games and this is one which has caused me to expend much midnight oil to get it running. There were originally two forms, an XBAS one which ran fine but was a bit slow and, dare I say, basic, and a version using a machine code keyboard reader which was lots better except that the 'move right key' insisted on moving left! The mistake was in the machine code, would you believe a D in place of a C? I have also



added some stuff at the end to prolong the Jump sequence a bit. As it was it was rather baffling.

Type in the XBAS listing and save as DOG.XBS

10 REM

80 CLEAR &8000

90 LOAD "SITES.OBJ"

100 SHAPE4,"070810202021223E2221202010080700  
F088848282C2223E22C282828488F000"

110 SHAPE0,"0101FF0344084909480443FF02040C0C808  
OFFC0221092901220C2FF40203030"

120 BCOL11:TCOL1,0:CLS40:MAG2:GOSUB 510

130 PRINT@3,2;"YOU ARE THE GUNNER IN A WORLD-  
WAR 1"

140 PRINT@3,4;"BOMBER WHICH IS BEING CHASED BY  
FOUR"

150 PRINT@3,6;"FIGHTERS. YOU MUST SHOOT THEM  
DOWN"

160 PRINT@3,8;"BEFORE THEY GET YOU. THE GUNSIGHT"

170 PRINT@3,10;"CAN BE MOVED AS FOLLOWS:-"

180 PRINT@11,13;"LEFT = N"

190 PRINT@11,14;"RIGHT= M"

200 PRINT@11,16;"UP = Q"

210 PRINT@11,17;"DOWN = A"

220 PRINT@3,20;"Press space-bar to test the machine"

230 PRINT@3,22;"gun and start the action.";

240 A=INCH:IF A<>32 THEN 220:ELSEGOSUB  
490:POKE64326,48

250 BCOL7:TCOL1,0:CLS:POKE 64318,136:F=500:B=300:T-  
COL15,6

260 FOR A=0 TO 2:PRINT@3,A:MUL\$(" ",35):NEXT:A=1

270 PRINT@4,1;"AMMO";@33,1;"FUEL":GOSUB 510

280 S1=11:S2=12:S3=15:S4=4:N=32

285 CALL &8000

290 X=INT(RND(3)):Y=INT(RND(3)):U=RND(500):PRINT-  
@33,3;F:PRINT@3,3;B

295 POKE &9003,0

300 IF X=Y THEN F=F-1

310 IF F=10 OR B=0 OR U=10 THEN 590

320 Y1=100+Y:Y2=38-Y:Y3=124+Y:Y4=164-Y

322 X1=52-X:X2=198+X:X3=160-X:X4=60+X

330 SPRITE1,X1,Y1,S1,0

340 SPRITE2,X2,Y2,S2,0

350 SPRITE3,X3,Y3,S3,0

360 SPRITE4,X4,Y4,S4,0

370 IF S1+S2+S3+S4=28 THEN 520

380 CALL &8008

390 A=PEEK(&9003):IF A=1 THEN B=B-1:GOSUB 450

440 GOTO 290

450 HX=PEEK(&9001):HY=PEEK(&9000):HY=191-HY

460 IF HX=X1 AND HY=Y1 THEN S1=7

470 IF HX=X2 AND HY=Y2 THEN S2=7

480 IF HX=X3 AND HY=Y3 THEN S3=7

485 IF HX=X4 AND HY=Y4 THEN S4=7

490 PSG6,15:PSG7,71:PSG8,16:PSG9,16:PSG10,16:PS-  
G12,16:PSG13,0:RETURN

510 PRINT@16,A;"DOG-FIGHT":RETURN

520 SPRITEOFF:BCOL2:TCOL1,0:CLS:F=500-F

530 PRINT@3,2;"Nice shooting. You have";B;"rounds"

540 PRINT@3,4;" of ammunition left and have consumed"

550 PRINT@3,6;" a total of ";F;" gallons of fuel.":H%=F/11

560 PRINT@3,8;"Your aircraft has received";H%;"hits-"

570 PRINT@3,10;"but none of these are serious."



```

580 PRINT@11,16;"Again(Y/N)?";;F=89:GOTO 610
590 SPRITEOFF:BCOL6:CLS:PRINT@5,5;"THE COCKPIT IS
ON FIRE(J to JUMP)":F=74
600 FORJ=1TO1500:NEXTJ:BCOL7:TCOL15,7:CLS:FOR
J=1TO1000:NEXTJ:BCOL2:TCOL15,2:CLS
605 PRINT@5,5;"You survived....THIS TIME!":FORJ=
=1TO1500:NEXTJ:GOTO580
610 A=INCH:IFA<89 AND A<74 THEN END:ELSE180
CLS:GOTO 180

```

Now for the machine code. With the Einstein in MOS, type in the following bytes with ENTER after each line. Don't forget the fullstop at the very end. Check for correct entry and then do a CONTROL/BREAK to put you in DOS and SAVE 1 SITES.OBJ on to the same disk that contains DOG.XBS.

```

3E6432009032019001003BCD2C800E08
3A0090ED79E5E13A0190ED79E5E13E04
ED79E5E13E01ED79CD3180C9D5CFC1D1
C91EDFCD8080CB7720073A00903D3200
901E7FCD8080CB4720073A01903C3201
901E7FCD8080CB4F20073A01903D3201
901EBFCD8080CB7720073A00903C3200
901EFECD8080CB7720053E01320390C9
3E0E010200ED797B010300ED79010200
3E0FED79ED78C9.

```

You can now run the program. It is not exactly ELITE of course, but there is some element of competition in it. My own personal record is shooting down all four fighters using just 25 rounds of ammunition and having lots of fuel left and only 10 bullet holes. Don't ask me how you avoid getting the cockpit on fire, I think it must be pure luck!



APRIL 98 STAFFORD COMPUTER SHOW  
By your Einstein Events Man -- Stephen Potts  
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Every year I try to bring a ray of sunshine into my show report. This April I am pleased to say we had another success. Two of the Einstein regular visitors came and had a chat. I am not very good at names but I think it was Arthur and John. Later in the day they called by again and when I told them about another visitor called Leslie Smith it turned out these were old buddies who collaborated on the book BEYOND THE SPECTRUM EMULATOR, and these friends tested the software.

Leslie is now disabled and doesn't have an Einstein. We don't let things drop like that and by hook or by crook there should be an Einstein on its way to him in the near future. Failing that, EUG member John Csucsni (please don't ask me to pronounce it,) has one he that is willing to share with us at the NOVEMBER Stafford Show. This could give Lee a whole new focus in life, and hopefully provide new software releases to benefit all of us in the future.

I try to encourage the flow between individuals by holding all the discmags Andrew Dunipace has let me hold for the stand. I also have some Amstrad discmags. I tried to put forward an idea I had on this line, but met with some resistance. My idea was that if we receive a copy of a disc mag we really ought to give a little something back. In terms we all understand, not a fixed price, but something that we can all relate to. The idea was to buy the originator of the discmag a pint of beer. In my case this would be 1.50. Not the ends of the earth, but an easy way of making an index linked return to encourage the production of this type of activity. I thought it a good idea, but it was not well received when put forward, so I must thank those who made a donation to the coffee pot. My suggestion was to give something back and not at a specific price but something that would float with time. After all you would always buy a friend a pint wouldn't you!!!!

During the show I did some disk copies, but without my home set-up I managed to get myself in a knot. I hope this didn't upset anyone. Talking of upset, I got Peter Hill's name wrong in my last report, but all was well with the FDC info from Western Digital I sent him, so I think I was forgiven.

The April show was well attended, which should have pleased Ray and Graham, of Sharwood Promotions. The hall is like two aircraft hangers, with a balcony restaurant. There is a lot of room with wide isles that could take two cars, so wheelchairs have no problems. There's lots of room to wander and look without being crushed, unlike at some shows.



APRIL 98 STAFFORD COMPUTER SHOW  
By your Einstein Events Man -- Stephen Potts

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There is even a bus to and from Stafford railway station. So do make a date for the next AMS show in November. If you are really keen you can drop in on the web site [HTTP://WWW.computerfairs.co.uk](http://www.computerfairs.co.uk).

There were lots of stalls this year, with lots of new kit at good low prices for those in that market, but less of the redundant bits and bobs stalls that I like to rummage round.

It takes all day for me to get a look around, grabbing the odd five minuets here and there, so I missed out on a Amstrad 6128 for pocket money, and a box of brand new three inch discs, still sealed in their plastic boxes; still at present I am not desperate. I had a printer buffer dropped in by Mike Smallman - thank you. I also said Hello to Stuart Marshall at one point. Well, there you have it, another hectic three days for me, and the best computer show I see all year over until NOVEMBER and the next one.

Finally do drop in at the stand, our point of contact for the Einstein. In NOVEMBER I will man the stand again and could always do with a kind word ....

If Sharward have got their act together in time there should be a show flyer and concession-price entry coupon with this issue of the magazine, with full show details and date. If not, pester them at:- SHARWARD SERVICES, 30 KNIGHTSDALE RD, IPSWICH, IP1 4JJ. (01473 741533) (FAX:- 01473 741361)

If you'd like to let Steve know you'll see him in November, he's at 85 THOROLD AVE, CRANWELL VILLAGE, LINGS, NG34 8DS, or phone him (considerately please!) on 01400 261839

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AND LAST BUT NOT LEAST .....

### ***A final word from The Editor***

If some members feel as I do, that the overall content of the magazine is A. boring (NOT 3.5 inch drives AGAIN!) or B. lacking in variety, then GUESS WHO IS TO BLAME!

Your overworked ED is doing his best, but he needs input from you, the Members. Every interesting letter or idea or request, or even better, program or article, fills a few more lines/pages and makes things more interesting for everybody. This magazine is poised on a knife-edge — don't let the PC grind it into the dust like so many other good mags.